

THE WEAK-FORM EFFICIENCY OF THE SAUDI STOCK MARKET

Thesis submitted for the degree
of Doctor of Philosophy at University of Leicester

by

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ABSTRACT

THE WEAK-FORM EFFICIENCY OF THE SAUDI STOCK MARKET

BY

ABDULLAH M. AL-RAZEEN

This study has examined the efficiency of the Saudi stock market by applying the weak-form test of the efficient market hypothesis, because the only information available is the prices of past years. To test for weak-form efficiency of SSM, the prices over a four-years period from 1992 to 1995 have been statistically analysed.

This thesis is divided into nine chapters. Chapter one is an introduction to this thesis. Chapters two and three briefly outline the structure of the Saudi Arabian economy and the financial system. The following two chapters review the classification of financial markets in general and the structure and regulation of the Saudi stock market.

Chapter six reviews literature concerning the efficient market theory and its implications in many studies.

Chapter seven discusses research methodologies used for market efficiency tests at the weak-form level in this study. In addition, data transformation and description are discussed.

Chapter eight contains the empirical examination including tests for empirical distribution of log price changes, auto-correlation tests, runs test and filter rules. The results are summarised in chapter nine.

However, this weak-form evidence indicates that the Saudi stock market has a lower level of efficiency than other large markets. The findings of this study are following the many researchers' suggestions that small markets tend to have lower levels of efficiency than large well-traded markets.

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Chapter One

INTRODUCTION

Introduction

An efficient capital market is a market that is efficient in processing information. The prices of securities observed at any time are based on "correct" evaluation of all information available at that time. In an efficient market prices "fully reflect " available information.

The issue of stock market efficiency is of great interest to both academics and practitioners and has received considerable attention in recent years . Much theoretical and empirical research has been conducted on the three forms of market efficiency: the weak-form in which current stock prices fully reflect the information implied by the historical sequence of prices; the semi strong-form in which current stock prices fully reflect all publicly available information; and the strong-form in which current stock prices fully reflect all available information public and private, and no investor can make an excess profit.

Empirical studies of market efficiency have most frequently focused on the Developed Countries (DCs). Little research has been conducted on the efficiency of the stock markets of the Developing and Less-developed Countries (LDCs).

Research on the Saudi Stock Market has remained limited. Only Felemban (1989) studied 28 stocks from March 1985 to January 1989, Malaikah (1990) from 1986-1989 and Algamdi 1996 tested the SSM from 1985-1991.

Purpose of this research

The main purpose of this research is to evaluate the Saudi Stock Market by testing the informationally efficient prices which are important, because:

1-to issuing firms for assessing the cost of capital generated either internally or by the issuance of new shares;

2- to have accurate valuation to investors for assessing the value of their portfolio holdings;

3- to reflect the market's assessment of managerial performance;

4-to have a clear picture for the market in general, to allow the government to plan for the future improvement to the stock market in particular and for the economy in general.

This will enable an answer to this question: “Is the Saudi Stock Market efficient in the weak-form?” In other words, are price changes independent random variables?

Part of the purpose of this study is due to the fact that no one has studied this market after the government computerised the stock market at the end of 1991 and gave SAMA full control to the market by the new regulations.

Methodology

In this study we will test the “Efficiency of the Saudi Stock Market” using a statistical technique known as the weak-form test of the Efficient Market Hypothesis.

The other form of the Efficient Market Hypothesis, the semi-strong and the strong-form tests, will also be discussed in this study . Testing the Saudi Stock Market using the semi-strong form or the strong form is not possible due to the absence of suitable data for the test . This shortage of data has had a significantly limiting effect on market studies in developing countries and in emerging markets in particular (Dickinson and Muragu, 1994). Data such as the acquired dividend is not available in the market

and the irrelevance of the price change with the dividend. The data used in this study is the weekly shares average prices for each of the 28 firms in various sectors between January, 1992 to December, 1995. The firms comprising the sample consist of those whose stocks have been most actively traded on the SSM over the study period. The basic hypothesis for this study is as follows : the Saudi stock market is informationally weak-form efficient.

This hypothesis will be tested against the price changes of stocks listed on the SSM. Saudi stock price changes will also be tested for normal distribution. The hypothesis will be accepted if it is determined that successive price changes are independent, because the weak-form efficient market hypothesis depends upon the following hypothesis: (H_0) a series of stock price changes are independent random variables.

Statistical methods used by researchers which also will be used in this study to test the weak-form efficient market hypothesis include

- an autocorrelation test (i.e., examination of the distributions of first order serial correlation coefficients) as a parametric test;
- a runs test (i.e. an analysis of runs of consecutive price changes of the same sign) as a non-parametric test and;
- a filter rule test;

These test methods have been used widely by many researchers and have proved more powerful than any other test methods on testing weak-form stock market efficiency.

Organization and outline of the study

This introductory chapter contains a brief background about the importance of market efficiency, the purpose and the organisation of the study.

Chapter two describes the Saudi Arabian economy. Alternative techniques and policies used by the government to regulate and utilise the income from oil and non-oil source of wealth in the Saudi economy.

The following three chapters review the structure of Saudi Arabia financial system and its classification and regulation of the stock market in the primary and secondary markets.

Chapter six reviews literature concerning the efficient market theory and its implications in many studies.

Chapter seven reviews research methodologies used for market efficiency tests at the weak-form level in finance literature. It also discusses research methodologies used for market efficiency tests at the weak-form level in this study. In addition, data transformation and description are discussed.

Chapter eight contains the statistical base of this study. It examines the Saudi Stock Market using the weak-form test of the efficient market hypothesis. The result will be compared with research results for other stock markets.

Chapter nine summarises and concludes this study.

Chapter :Two

The Economic Structure for the Development of Saudi Arabia

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2.1 Introduction

This chapter contains a general outline of the Saudi Arabian economy. Its development, objectives, policies and programmes will be introduced to give the reader a better understanding of the Saudi economy and how its strengths support the stock market.

This chapter also examines how the Saudi economy has developed with specific attention given to the government's five-year economic development plans which up to now six development plans from 1970- 2000, and finally a general overview of the private sector will be given.

2.2 Historical Development

During the period prior to the discovery of oil, Saudi Arabia had an agricultural economy based on livestock. The majority of the population lived in small mud brick villages on ground level.

After the discovery of oil in 1938, the Arabian-American Oil Company (Aramco) initiated production with an output of just 31 million barrels. Oil production was temporarily disrupted by

World War II but, from 1944 to 1945, output multiplied almost three times from 7.8 million barrels to 21.3 million barrels, reaching 89.9 million barrels by 1947. The next great increase in output was in 1948, when crude oil output rose by nearly 60 percent compared to 1947.

Saudi Arabia is one of the world's fastest growing economies. As the owner of the world's largest known oil reserves (officially estimated at 169 billion barrels in early 1985, which would allow over 100 years of extraction at 1983 levels), the world's largest foreign exchange reserves, and perhaps the most ambitious development plans ever undertaken, Saudi Arabia ranks as a significant world economic power (Abdeen and Shook, 1984).

2.3 Review of Economic Development

Most of Saudi Arabia's wealth or total capital stock is composed of oil reserves. Since the price of oil can fluctuate abruptly and unpredictably, the value of this wealth is uncertain. In order to reduce the dependence of the Saudi economy on this single source of wealth and thereby reduce the variability of its present value, the economy must be diversified. So, the major aim of Saudi

Arabia's development plan has been diversification of the economy so as to maximise income (Soufi, 1985).

Economic development in Saudi Arabia has been made under a series of five-year development plans. The first was in 1970 when the first small oil revenues allowed the government to improve economic and social conditions in the country. Before 1966, dependable statistics were not available but the Gross Domestic Product (GDP) increased more than 100 percent from 1966/67 to 1972/73, at an annual rate of 12.9 percent. From 1966/67 to 1969/70, real GDP rose 28.3 percent, at an annual rate of 8.6 percent and in 1970/71 it rose 40.4 percent, with an annual rate of growth of 18.6%. Considering the many economic and social barriers to development, this growth rate is remarkable (Ministry of planning; Ba-Owaidan, 1994).

Planning has been a crucial factor in leading the economic and social development of Saudi Arabia during the past twenty years, and will become even more vital as conditions and needs become more sophisticated and the country enters a new development period.

The Five Year Plan reflects a long-term vision and gives a framework for restructuring the country's productive resources, expanding its industrial sector, and introducing modern technologies. Formulating a plan entails the specification of objectives for each dimension of development: economic, social and institutional, and designing the most effective ways to achieve them. How successful each plan was to development depends partially on the consistency of its multiple aims and the priorities set for each successive plan period, and on the practical design and implementation of its policies and programmes.

The rate of development rose substantially during the First and Second Development Plan periods, when the first sharp rise in world oil prices generated considerable government income. The further increase in the country's oil revenue during the Third Plan led to more opportunities for a rapid increase in government expenditure, which promoted very high rates of investment in infrastructure and rapid economic growth. Although the unpredictability of the world oil market during the Third Plan period caused a drop in oil revenues, which had a negative affect on development programmes under the Fourth plan and caused delays, the government has taken sound action to restructure the

country's economic base to allow the economy to sustain its long-term momentum.

From 1970 to 1985, the systematic progress in long term economic diversification into manufacturing, agriculture, and financial services, in education and manpower development, and in the provision of health and social services, continued rapidly.

During the last 20 years the public and private sectors have been developed successfully as the economic and social needs of Saudi Arabia have become more sophisticated.

The long-term strategic goals have been formulated since the First Development Plan to give a basis for future development and the achievement of national goals.

2.4 The First Development Plan (1970-1975)

The First Development Plan (1970-75) was the first comprehensive approach to economic development in the Kingdom. The budget allocated for this plan was set at SR. 41.3 billion of which SR. 18.4 billion (44.5%) was invested in capital projects.

One of the major aims of the First Development Plan was to accelerate GDP and to develop human resources in order to contribute more effectively to production and participate in development. It also sought to diversify sources of national income and cut reliance on oil, by expanding the share of other productive sectors such as agriculture and industry, with specific emphasis on petrochemicals, where Saudi Arabia has a comparative advantage. Prominence was also given to physical and social infrastructure.

In spite of financial limitations the government has fulfilled the aims of its First Plan. The rate of growth of GDP rose from 13.1% in 1970 to 20.5% in 1973. The non-oil sector growth rate increased markedly, with its contribution to GDP increasing from SR. 7,802 million in 1970 to SR. 11,857 million in 1973 in current prices.

The financial scale of the First Development Plan was moderate compared to those that followed but it set up for the first time a comprehensive planning framework for the systematic construction of a modern infrastructure, the improvement of government services, and the development of human resources, thus building a

platform to achieve long-term strategic goals.(Ministry of Planning, 1990)

2.5 The Second Development Plan (1975-1980)

The Second Development Plan demanded rapid growth in all sectors of the economy, benefiting from the large increase in world oil prices which yielded considerable government returns. These revenues were directed mainly towards setting up the physical and social infrastructure needed for a stable, productive and fair society (Ministry of Planning, 1990; Ba-Owaidan, 1994).

The largest properties of capital investment in the economy was government inspired while private sector activity was concentrated mainly in the construction and trade sectors. During the period of the Second Plan, some effective institutions were set up to guide and assist industrial development and to achieve the long-term goal of economic diversification (Ministry of Planning, 1990).

By 1979, when the Second Plan came to an end, the achievement was considerable and progress had been made in each major area of development. Saudi Arabia had become the largest

oil exporter and third largest oil producer in the world. The majority enjoyed a standard of living comparable to those in the developed countries, and most of the physical infrastructure had been achieved giving an outstanding platform for future economic and social development.

As a result the economy enjoyed a remarkable rate of growth. The average annual growth rate of GDP was 9.2% and that of the non-oil sector was 14.8%. Per capita GDP rose from SR. 23,980 in 1975 to SR. 43,400 in 1980, while it had been only SR. 3,185 in 1970. (SAMA 1980)

In the overall context of the long-term goals that guided the development process, each plan had its own specific activity. The First and Second Plans reflected both the stage of development and the resources available to the government.

2.6 The Third Development Plan (1980-1985)

In 1980 the Third Development Plan was introduced to build a physical infrastructure and to set up a more diversified economy. Large-scale public sector investments were initiated in capi-

tal-intensive industries connected to the country's petroleum resources.

The Third plan objectives were more specific prioritising growth in the production sectors, notably hydrocarbon and other manufacturing industries, and limiting the growth of the expatriate labour force. In manufacturing industries, the private sector was more influential and agriculture became a high-growth sector in response to government incentives and funding (Ministry of Planning, 1990). As a result of the large levels of capital formation during the first two plans, the need to maintain and operate existing infrastructure meant a switch from capital to recurrent expenditure during the Third Plan.

The rapid rate of economic progress during the Second and Third Plan years was associated with a rise in the number of foreign workers, which showed the need to develop Saudi human resources and reduce the reliance on expatriate labour.

This plan made great contribution to the diversification in the country which is one of the dominant structural objectives of the development process. For example, during this plan, substantial growth in the agricultural sector was reported and the country was

almost self-sufficient in most products over this period. By the end of this plan period most of the country's infrastructure and the major basic and heavy industry projects were completed (Ministry of Planning, 1985; Presley and Westaway 1989)

2.7 The Fourth Development Plan (1985-1990)

The Fourth Development Plan began on 22 March 1985 and was implemented during a period of great change in the financial circumstances of the country. The rise in oil returns at the end of the Second Plan and the start of the Third Plan gave opportunities for accelerating certain areas of development, but could not be considered a permanent part of the economy. Thus it was obvious that when the Fourth Plan was being formulated government revenues would be a lot less than during the Third Plan and, as a result, a more practical approach was needed in financing both recurrent and project expenditures.

The Fourth Plan was formulated with totally new objectives which may be summarised as follows:

- To continue structural change in the economy through diversifying the economic base and reducing dependence on crude oil as the main source of national income;

- To support the rapid growth of the private sector as the principal mechanism for achieving economic diversification and to improve the economic efficiency of the government sector;

- To complete the remaining infrastructure projects necessary to achieve long-term economic and social development and to develop further the kingdom's human resources;

- To concentrate on the development of quality by improving the efficiency of facilities constructed during the first three development plans. (Albogami, 1995; Fifth Development Plan, 1990)

The plan projected that investment in the non-oil private sector would expand by an average of 10% a year, increasing the sector's share of gross fixed capital formation from 35% in 1985 to 50% by 1990. The development of human resources was given prominence, accounting for 27% of the development funds allocated, with priority given to education and job training. Industrial

diversification was still a major goal of the Fourth Plan which emphasised the need for rationalisation and efficiency. The Fourth Plan confirmed the diversification aims of the Third Plan, with even more prominence on restructuring the economy and with the private sector playing a main part. Thus, with the absence of growth in the overall economy, the private sector identified and developed new opportunities

The fact that oil revenues are unpredictable had a major impact on the economy in the first twenty years of planning in Saudi Arabia. Oil income, which regularly accounted for most of total government revenues, peaked in 1981/1982 and fell steadily in the following years of the Third Plan period. Further declines occurred during the first two years of the Fourth Plan, and more stable oil revenues followed in the late 1980s. Due to this drop in government oil revenues, the budget for the fiscal year 1983/84 showed a deficit of SR. 23,766 million between the total expenditure and total revenue. The shortfall was covered by drawing from the general reserves (SAMA, 1990).

Also, non-oil revenues declined during the Fourth Plan, despite rising as a proportion of total government revenues. As a result,

expenditure on projects associated with this plan were rapidly reduced, resulting in an overall reduction in government spending of 20% below the Fourth Plan target. For example, the budget deficit was \$18.4 billion and \$6.6 billion for the years 1986 and 1987 respectively. In addition, foreign reserves were used in the early years of the Fourth Plan to offset falling oil revenues and a major budgetary initiative, the issue of government development bonds, was introduced in the fourth year of the plan. (Ministry of Planning 1990)

The percentage of workers in the public sector grew to maintain the level of essential services and to make up for the lack of job opportunities in the private sectors (Ministry of Planning, 1990).

At the end of the Fourth Plan a new fiscal policy was introduced as government revenues used to finance development projects were supplemented by domestic borrowing, instead of continued deletions in the country's foreign reserves.

2.8 The Fifth Development Plan (1990-1995)

The Fifth Plan was introduced in August 1989. This plan may be regarded as the beginning of a second stage of planning in the

Kingdom, when most of the physical infrastructure was largely finished, and the processes of economic diversification and of restructuring were in progress, and most of the institutional framework for development had been established and the private sector was ready to deal with the tasks which had previously been carried out by the government.

The main strategic themes have been highlighted and identified as a means of achieving its objectives. These are: stabilisation of the economy through the steady growth of government expenditure; development of both government and private institutions; extension of the private sector's role by encouraging investment through an appropriate combination of regulatory and institutional initiatives, information dissemination, financial and other incentives; intensification of structural change through growth; improving quality, efficiency and competitiveness; intensified utilisation and development of Saudi human resources; maintaining welfare and quality of life of Saudi society; achieving balanced growth; acceleration of scientific and technological development; and strengthening and expanding international linkages. (Ministry of Planning, Fifth Development Plan 1990)

The Fifth Plan lays stress on the development of human resources by ensuring a constant supply of manpower, upgrading its quality and improving its efficiency to meet the requirements of the national economy. Dependence on the production and export of crude oil as the main source of national economy was to be reduced. Real structural changes in the country's economy were to be continued so as to establish a diversified economic base with due emphasis on industry and agriculture. Mineral resources were to be developed, and their discovery and utilisation encouraged. The infrastructure projects necessary to achieve overall development were to be completed, and private sector participation in socio-economic development was to be encouraged.

The private sector in this plan had arrived at the point which would allow for its more effective participation in the country's development. This is of great importance in view of the need to stimulate a net inflow of private capital from abroad, and from within the country, to participate in development projects and increase the level of foreign direct investment in the country.

The development of a capability to successfully absorb and efficiently utilise available technologies, and to become innovators

of technologies tailored to the country's environment, is a necessary condition for the next stage of development. The methods and institutions necessary for developing this capability are significantly more complex than those needed for developing the physical infrastructure. (Ministry of Planning, 1990)

2.9 The Sixth Development Plan (1995-2000)

The Sixth Development Plan was given approval by the Council of Ministers for the period of 1995-2000 in July 1995. According to the statement issued by The Ministry of Planning the first five development plans achieved distinguished accomplishments in all economic and social fields, and had primarily aimed to ensure progress and increase the general standard of living and welfare for all citizens within an Islamic framework. The main themes of this plan can be summarised in three points:

- to increase the level of performance of public and private sectors;
- to increase the rate employment of the development and replacement of Saudi human resources;

- to increase the opportunities for private sector investment in the national economy;

The Ministries Council set out specified objectives in resolution No. 142 dated 1993. It aimed to create about 700,000 jobs by creating 191,700 new opportunities and 148,700 vacancies, in addition to another 319,500 openings by replacing non-Saudi manpower. The plan also encouraged the private sector's participation in the economic and social development process. In this plan only there was more importance stressed on the use of private sector capital to finance government projects. Dialogue with the private sector would be stepped up and small establishments supported. The establishment of huge joint-stock companies and attracting foreign investments through joint ventures or individual projects with large capital and advanced technology are other highlights of the plan. It also expected that the dependence on the production and export of crude oil as a main source of national revenue would be reduced and continue to make real change in the country's economic structure by a constant shifting towards diversification of the production base, by concentrating on industry and agriculture in particular. Gross Domestic Product (GDP) growth in non-oil sectors is projected at

an annual average rate of 3.9 per cent, with total value added SR. 301.5 billion at the end of the plan, which is approximately double the rate achieved in the Fifth Plan. Government credit agencies will extend with a total SR. 24,101 million during the plan. Other development areas focus on natural resources, production, human resources, social development, basic services and utilities. (Ministry of Planning, 1995.)

2.10 The Private Sector

The concept of the 'private sector' in Saudi Arabia includes all economic activity which is not performed by the government or government-owned companies. This includes all private firms operating for profit, whether formal or informal, in the industrial, agricultural or service sectors, as well as non-profit private organisations such as chambers of commerce and co-operative societies. (Ministry of Planning ,1990)

Over the past two decades, the real output of the private sector has grown fivefold in volume terms. The growth of the private

sector during the Fifth Plan Period (1990-1995) has been noted as the flowing:

- Private investment increased at an average annual growth rate of 13 percent, from SR 28 billion in the first year of the plan in 1990 to more than SR. 46 billion in the last year of the plan in 1995;
- The new private establishments registered in the Commercial Register were more than 100.000;
- The new companies private registered reached 1,534;
- The new stock companies established were 17 with SR 6 billion total capital, to being the total number of stock companies to 98, with capital of about SR 53.9 billion;
- The total employment figure in the private sector was more than 6 million by the end of the plan (1995), which rose from 1.4 million in 1980.

The above activities have resulted in the capital market growing substantially in the Fifth Plan period in terms of the volume and value of shares traded. However, some constraints are

impeding the capital market's effectiveness in mobilising and directing savings towards investment channels, and have reduced the market's ability to absorb and trade government equity shares in some of the public sector enterprises proposed for privatisation (Sixth Development Plan 1995). Table (2.2) shows the major indicators of private-sector development between the First Development Plan -1975 and the Fifth Development Plan in 1995. However, in the Sixth Development Plan the estimated figure for the high contribution of the private sector has been considered (table 2.6 and 2.7) which is from its three major themes.

In general, the private sector in Saudi Arabia has developed significantly to meet the needs of economic development.

In the next chapter more details about the role of the financial system and the financial foundations in Saudi Arabia will be discussed.

TABLE 2.1 EXPENDITURE OF DEVELOPMENT AGENCIES IN THE FIRST FOUR Development Plans (1970-1975) to (1985-1990)

Plan	First		Second		Third		Fourth	
Development Sector	SR million	%	SR million	%	SR million	%	SR million	%
Economic Resources	9,469	27.7	97,279	28.0	192,185	30.7	71,193	20.4
Human Resources	7,034	20.6	51,035	14.7	115,007	18.4	115,133	33.0
Health and Social	3,515	10.3	27,600	7.9	61,237	9.8	61,882	17.7
Infrastructure	14,116	41.4	171,298	49.3	256,795	41.1	100,738	28.9
Total	34,134	100	347,212	100	625,224		348,946	100

Source: Ministry of Planning, Sixth Development Plan
(1995-2000)

TABLE 2.2 THE MAJOR INDICATORS OF PRIVATE SECTOR DEVELOPMENT BETWEEN 1975 AND 1995

The fiscal year	1975	1995
Number of Operating Companies	1,473	7,643
Invested Capital (SR billion)	7.0	108.7
Contribution to GDP (%)	21.0	45.0
Contribution to Fixed Capital Formation (%)	34.0	67.0
Employment in the Private Sector (million)	1.7	6.0

Source: Ministry of Planning, Sixth Development Plan (1995-2000)

TABLE 2.3 FIRST PLAN OUTLAY (1970-75)

sectors	Recurrent Expand	%of total	Proj. Expend.	%Of total
Public Admin.	6794.6	29.6	922.8	5.0
Defiance	3980	17.4	5575	30.3
Sec.Services	77631.1	33.9	1535.4	3.4
Develop&public utility	1246.9	5.4	3325.4	18.1
Transport & Communication.	1767.3	7.7	5709.2	31.1
Industry	321.8	1.4	776.7	4.2
Agriculture	973.8	4.2	493.9	2.7
Trade &Services	83.5	0.4	43.8	0.2
Total	92799	100	18382.5	100

Source: Ministry of Planning, First Development Plan
(1970-75 :p43)

*SR Millions

TABLE 2.4 SECOND DEVELOPMENT PLAN (1975-80) OUTLAY (SR BILLION)

SECTOR	RECURRENT	PROJECTS	TOTAL
Economic Resource Develop.	4.5	87.6	92.1
Human Resources Develop.	43.9	36.2	80.1
Social Development	18.1	15.1	33.2
Physical Infrastructure Development	12.5	100.4	112.9
Administration & Defiance	32.7	83.7	116.4
External assistance (emergency funds, food subsidies, general reserve)	54.9	8.6	63.5
Total	166.6	331.6	498.2

TABLE(2.5) GROSS DOMESTIC PRODUCT BY SECTOR IN THE SIXTH PLAN
(SUMMARY) .

Main Sectors	Added Value (SR billion)		Average Annual Growth(%)
	1995	2000	
Producing Sectors	93.2	114.5	4.2
Manufacturing	31.1	39.5	4.5
Service Sectors	89.8	111.2	4.4
Non-oil Sectors	249.4	301.5	3.9
GDP	380.8	458.6	3.8

Source: Sixth Development Plan, p117.

TABLE (2.6) ESTIMATES OF CAPITAL INVESTMENT BY SECTOR, (SUMMARY).

The Sectors	Investment by sector			Share in Total(percent)		
	1990	1995	2000	1990	1995	2000
Producing Sectors	16.0	21.7	45.8	26.4	31.9	40.5
Services Sectors	14.7	17.0	21.0	24.4	25.0	18.5
Government Services	19.9	12.3	28.3	32.9	18.1	25.0
Residential Housing	8.4	11.6	13.7	14.0	17.2	11.9
Total Investments.	60.4	67.9	113.4	100.0	100.0	100.0

Source: Sixth Development Plan, p.127.

TABLE (2.7) ESTIMATES OF SIXTH PLAN INVESTMENT FINANCING REQUIREMENTS , BY SECTOR AND SOURCE. * (SUMMERY)

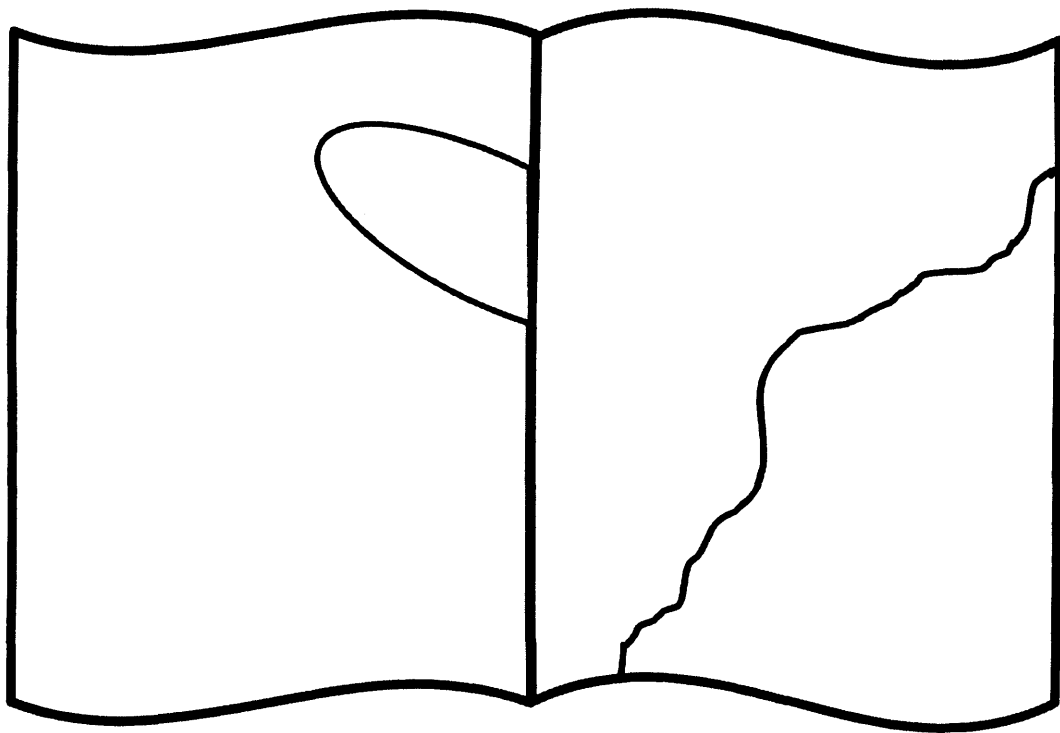
Sector	Total Sixth Plan	Private Sector	Public Sector**
Producing Sectors	181.0	88.9	92.1
Service Sectors	92.0	76.8	15.2
Non-oil Sectors	440.5	212.7	227.8
Crud oil & Natural gas	31.5	00.00	31.5
Total Investment	472.0	212.7	259.3

*SR billion at current prices

** Government agents and public companies

Source: Sixth Development Plan(1995), p129.

SPECIAL NOTICE



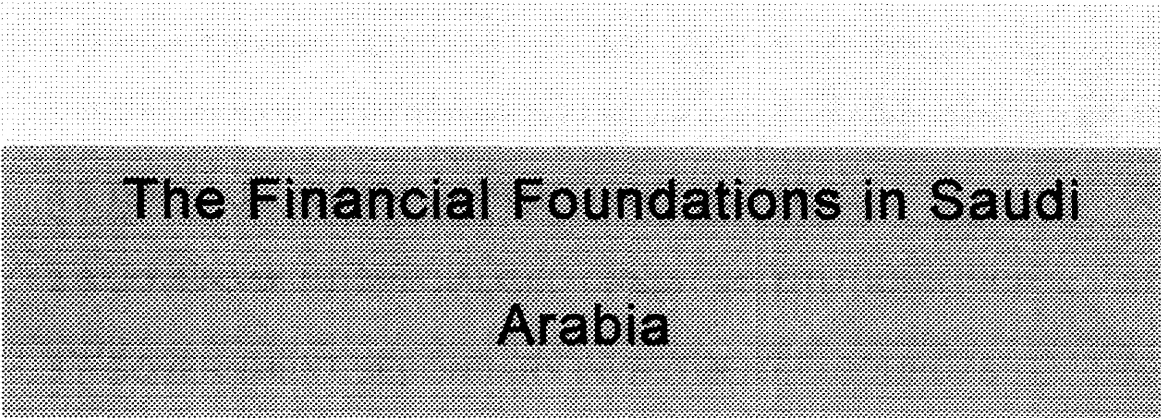
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TABLE (2.8) ACTUAL AND TARGET GROWTH RATES THROUGH THE LAST FOUR PLANS OF DEVELOPMENT

Sectors	Third Plan 1980-1985		Fourth Plan 1985-1990		Fifth Plan 1990-1995		Sixth Plan 1995-2000
	Target	Actual	Target	Actual	Target	Actual	Target
Non-oil sectors							
Producing Sectors:							
Agriculture	5.4	9.5	6.0	13.4	7.0	3.1	3.1
Other mining	9.8	7.3	3.0	-0.9	4.0	4.9	9.0
Other Manuf.	18.8	11.7	15.5	0.5	7.7	2.2	4.9
Utilities	29.5	21.2	5.0	5.9	6.9	4.5	5.5
Construction	-2.5	-2.4	-2.8	-7.7	3.8	-	4.0
Service sectors							
Trade	8.4	8.7	2.5	-1.5	3.0	1.3	6.2
Transport	12.9	7.1	5.0	-0.8	3.2	1.6	2.9
Finance	7.3	2.5	4.1	-4.6	5.1	1.9	4.1
Other services	3.0	4.4	3.5	2.5	1.7	0.7	...
Government	7.2	7.3	-	1.7	0.8	2.8	2.7
Total non-oil sectors:	6.2	6.2	2.9	-1.1	3.6	1.19	3.9
Government	7.2	7.3	-	1.7	0.8	2.8	2.7
Private	6.0	6.0	3.5	-1.8	4.6	1.5	4.3
Oil Sector	1.3	-14.4	5.6	5.1	2.7	8.9	3.8
Total GDP	3.3	-1.6	4.0	1.3	3.2	5.3	3.8

Source: SAMA Annual Report, 1975. p.53

Chapter Three



The Financial Foundations in Saudi Arabia

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3.1 Introduction

The structure and efficiency of the financial system in any economy are largely dependent on three basic economic functions: first, to mobilise resources by offering investment opportunities to savers and holders of financial assets; second, to disburse funds to productive uses in the economy, primarily through loans or equity investments; and third, to ensure efficient inter-mediation between sources and users of funds.

In Saudi Arabia the fulfillment of economic and social development plans are made possible through a financial system which channels government revenues through public and private financial institutions. Although the financial system in Saudi Arabia has developed significantly during the last two decades, it needs strengthening further to meet the investment requirements of the development plans more effectively. In addition, the relations between the financial foundations in the Saudi system are strong in both public and private sectors.

In this chapter the development of the financial foundation in Saudi Arabia will be discussed, with particular focus on the money

and capital market intermediaries and their impact on the economic development of the country.

3.2 The Saudi Money Market Intermediaries

Prior to 1948 Saudi Arabia did not have a financial system and only one commercial bank operated in the economy. During the 1950s the government realised that the increasing oil revenues provided a unique opportunity to accelerate the country's economic development, and to achieve that goal it was decided to establish a financial system (Knauerhase, 1977). In fact the structure and efficiency of the financial markets in any economy are largely dependent on the banking system, and the Saudi Arabian financial market is no exception. The dominating force is the Saudi Arabian Monetary Agency (SAMA), with policy direction coming from the Ministry of Finance and National Economy which controls the financial system in Saudi Arabia.

3.3 The Saudi Arabian Monetary Agency (SAMA)

SAMA was established in October 1952 and was introduced to be responsible for the development of the country's financial system and perform the general functions of a modern central bank. According to Royal Decree 23 dated 15-12-1957, the objectives of SAMA were defined as follows:

- to issue and strengthen the Saudi currency and to stabilise its internal and external value;
- to deal with the banking affairs of the Government (rendering fiscal agency services);
- to regulate commercial banks and exchange dealers;
- to manage the country's official foreign exchange reserves.

In addition, SAMA has no capital, but it is allowed to cover its expenses by charging a fee to the government, corporate and individuals. Structurally, SAMA is under the control of a Board of Directors which is responsible for its efficient administration and operations. The Board of Directors is responsible for the formulation of policies directed toward the efficient administration

and operation of the Agency, and has such powers as are necessary and appropriate to the end.

One of SAMA's major functions is economic research, which will enable it to advise the government on various economic issues and perform a key role in economic policy making. It gathers, classifies, and analyses the monetary, exchange rate and bank activity data and to assist the government in formulating and carrying out financial and economic policies, which in turn will promote economic development and growth (Abdeen and Shook, 1984).

3.4 Commercial Banks

The prime domestic financial institution is the commercial banking system, functioning in its normal banking role and as the main vehicle to achieve Saudi ownership of the country's financial system. The commercial banks activities are essential to expanding private sector investment. Their long-and medium-term lending activities should be increased and their credit policies adjusted in accordance with SAMA. The merging of many small similar private firms into larger organisations would ,via economies of large-scale production, reduce average production costs, thus

improving competitiveness, and promoting greater financial muscle. The development of Saudi Arabian commercial banking has been significant.

The first commercial bank, a branch of the Netherlands Trading Society, (today called Al-Bank Al-Saudi AlHollandi) was set up in 1927. The next foreign banks served non-Saudi expatriates working in the country or performing Hajj the pilgrimage to Makkeh.

The first Saudi bank, (The National Commercial Bank) established in 1938, was no more than an upgraded foreign exchange shop. Its founders were foreign-exchange dealers providing for non-Saudi visitors to the holy places. The new bank, however, increased its involvement in financing international trade by opening Letters of Credit via foreign correspondent banks. Thus, commercial banks combined foreign exchange dealings with promoting international trade.

The second Saudi-owned bank (Riyadh Bank) was established in 1957. In 1964, the bank found itself in financial difficulty and SAMA bailing it out acquired 38% of its capital in the process. The Riyadh Bank has become the second-largest bank in the country after the National Commercial Bank

Since the banking industry in Saudi Arabia has seen considerable growth in the number of branches and in the range of banking services.

By 1961, there were twelve banks in the country. The only new banks allowed to open branches in Saudi Arabia since then were the United Bank Limited of Pakistan and Bank Melli Iran 1971. All these banks were engaged mainly in accepting deposits from businesses dealing in foreign exchange and promoting the country's import trade. Since most of the nations' needs were imported, the banks had enough business to justify their few offices. These offices were based in a small number of cities around the holy places in the western province and in the oil cities in the eastern province. All the banks had their main offices in Jaddah the main seaport on the Red Sea, and the gate to the holy city of Makkah.

In 1966, the "Banking Control Law" was decreed which set the rules and regulations to which banks must follow. O'Sullivan considered this law a "watershed in the development of Saudi banks where the informal approach to regulations favored in Europe" was replaced with a set of restrictive regulations.

Reserves and prudence ratios were stipulated to guard against problems of liquidity and insolvency.

The increase in oil revenues and the injection of new capital into commercial banking from many sources after 1973 required an expansion in banking services.

3.4.1 The Saudization process

In 1976, the Council of Ministers initiated the Saudi-ization of the foreign-owned banks in the country. Since the Banking Law in 1966, the restrictive policy of opening new branches by the foreign banks was maintained. One of the main motives for Saudization was that the branches of the foreign banks in the country were carrying out policies formulated by their foreign parent banks. These policies were often incompatible with Saudi Arabia's development plans and, led to a banking system which financed mainly foreign trade and did not prioritise long-term loans vital to the nation's economic growth.

The locally-owned banks, however, did not keep up with the growing countrywide demand for banking services. From 1967 to

1975, bank offices rose at an annual compound rate of 5.5%, while the total assets of banks increased at a rate of 25.4%. The monetary authorities were forced to respond to the increasing demand for improved and expanded banking services, as well as by an awareness that a more competitive banking environment was desirable.

In 1976, the government allowed non-Saudi banks the option of saudi-ising or withdrawing from the Saudi market. Saudization resulted in a majority (60%) Saudi private ownership of these banks. None of the banks chose to withdraw from the lucrative Saudi market. The operation was made very attractive by letting the banks to issue new stocks equivalent to the additional 60% Saudi ownership. Thus, the capital of the banks was considerably expanded and their ability to increase their business enhanced. Also, the monetary authorities ability to monitor and control the banks was considerably increased. Thus, SAMA allowed the non-Saudized banks to expand their branch network. From 1975 to 1984 the amount of bank branches rose from 78 to 524, a compound annual growth rate of 23.6%. During the same period the total assets of commercial banks rose from SR. 11.8 billion to SR. 145.3 billion, at an annual compound rate of 32.2%. The

growth of bank offices, combined with flourishing economy allowed this to happen.

The two solely Saudi banks maintained their domination of banking business due to being well established already and network in the business community, especially in provincial areas. By 1979, these two had 73% of the branches and 65% of the assets of all commercial banks. This proportion declined to 62% in 1982 and is expected to decline further due to the increased competition from the Saudized banks. The Saudization process was virtually finished by 1982 and newly Saudized banks were now competing equally with the other two Saudi banks.

The rise in commercial banking in Saudi Arabia since the introduction of Saudization has been phenomenal. This expansion was due not just to Saudization, which let Saudized banks spread their services nationwide but just as much to the remarkable rise of the national income from oil, which has been encouraging economic growth and development all over the country. The population-to-bank-branches ratio has 19000 to 1 in 1984 a decrease from 111.800:1 in 1967 . This growth in bank branches

was matched by outstanding growth in the consolidated balance sheets of the commercial banks.

Further, foreign banks were concentrated in the largest cities and were denied growth in their capital base in order to provide services for those rural areas with too few banks. Further, as a result of rapid growth and that foreign banks were not properly controlled by SAMA, the high profits earned were largely moved abroad. The change obviously led to a considerable development in the Saudi capital market in general and the Saudi stock market in particular.

A consequence of the Saudization bank programme, effectively finished by 1980, is that commercial banks were categorised into "local banks" and "other banks". The first category includes the two 100 percent Saudi-owned banks: National Commercial Bank (NCB), the largest commercial bank in the Middle East with 229 branches in Saudi Arabia, two overseas branches and four representative offices; and Riyadh Bank, the second largest bank in the country, with a national network of 164 offices in Saudi Arabia and two branches in London, an agency in Houston, Texas, and

share holdings in various international banks and correspondent banking relationships world-wide (Riyadh Bank, 1991).

The second classification includes nine banks: Saudi Holland Bank (SHB), Saudi French Bank (SFB), Saudi British Bank (SBS), Saudi Cairo Bank (SCB), Arab National Bank (ANB), Saudi American Bank (SAMBA), Saudi United Commercial Bank (SUCB), Al-Jazirah Bank, and Saudi Investment Bank (SAIB).

The method by which the foreign banks became Saudi joint stock companies was based on the calculation of the book value of the foreign bank, which was set at 40% of the capital of the new bank. In this way foreign banks were able to keep a 40% ownership, apart from Al-Jazirah Bank, which retained only 35%. The remaining 60% of capital was split between the Board of Saudi sponsors (24%) and the Saudi public (36%). But, when the foreign partner in Saudi Cairo Bank did not participate in the 100% capital increase of 1988, its foreign capital ratio was reduced from 40% to 20%.

Saudi Investment Bank (SAIB) differs from other banks, since its formation was for investment providing long-term financing for Saudi industries, commercial and agricultural ventures rather than

commercial banking. Consequently, its rate of growth was less sharp than that of other banks. It has eight branches: five in Riyadh, and one in Jaddah, Al-Khobar and Dammam. Also, it routinely carries out substantive transactions with associated and correspondent banks and other world-wide financial institutions. (Saudi Investment Bank, 1991)

A number of benefits have followed from the Saudization programme:

1) the Saudiized banks could increase their capital base and the number of branches in the country on an equal and competitive basis with the two 100 percent Saudi banks, thus ensuring the public received better low cost banking services. This will influence the Saudi money market which is dominated by those commercial banks specialising in short and mid-term finance.

2) Saudi nationals had considerably more chances to work in and manage and own shares in these banks.

3) Bank services were expanded because the Saudiized banks were closer to the public and so able to reach with greater

flexibility with appropriate banking services, including branches exclusively for women.

In January 1991 bank deposits decline with the outbreak of the Gulf war, their level falling by SR. 3.9 billion. However, this was followed by a sharp upswing of SR. 19.5 billion or 13.9% during February to June 1991 and by the end of 1996 there was a net rise in bank deposits of SR. 215.4 billion .

The number of commercial banks branches increased from 1,131 in December 1992 to 1208 at the end of December 1996. Of these, 473 were in Western and Southern Provinces, 507 in the Northern and Central Provinces, and 228 in the Eastern Province. Commercial banks expanded their capital and reserves from SR. 24.5 billion at the end of 1992 to SR 54.1 billion at the end of 1996 to meet private investors' demand for financial services (SAMA, 1996).

As the Saudiized commercial banks move towards a more competitive banking environment, the offshore banking units (OBUs) in Bahrain exert significant money and banking market influence on the Saudi money market institutions. The OBUs provide a means to meet domestic banking needs in Saudi Arabia

which can not be served onshore and provide many essential services which allow government and private Saudi investors to enter the international money market.

The Saudi international banks and their activities have grown in importance and independence, to give another choice and outlet for Saudi money market funds. They offer a means of diverting funds straight into Western markets.

Development and trade spending in Saudi Arabia has been the prime factor in the expansion of the OBUs and the Saudi international financial institutions

3.4.2 Money Exchangers

The oldest known financial institutions in Saudi Arabia are the money exchangers. They were originally formed to serve pilgrims who arrived in Makkah with different currencies from all over the globe. The money exchangers used to carry out all the tasks normally performed by the commercial banks. They operated in a relatively uncontrolled environment, issuing money drafts, dealing in precious metals, and sometimes even arranging letters of credit.

There were no reporting requirements, no published balance sheets and no laws governing them.

This caused the Ministry of Finance and National Economy to initiate control on. Until late 1981, the Ministry of Commerce issued licenses for the money exchangers, with only minimum financial requirements. The freedom from reserve and other banking restrictions also became a source of concern for SAMA, which felt control of the money exchangers to be an important aspect of the future development of the private financial system.

In spite of the money exchangers' reputation for honesty and reliability, SAMA, by the end of 1983, subjected them to the requirements already forced on the commercial banks. By 1985 the money exchangers were limited to solely exchanges. The only means through which the money exchangers could provide loans and take deposits was by registering as commercial banks under the control of SAMA regulations. A consequence of these measures was that the biggest money exchangers, Al-Rajhi for Exchange and Trade, registered as a commercial bank under the name of Al-Rajhi Banking Investment Corporation. Its entry to the banking

system meant that the number of fully owned Saudi banks amounted to three and the overall total to twelve.

3.4.3 The Commercial Banks' Performance

The commercial banking sector witnessed high rates of growth during the Fifth Development Plan period, as reflected by the following:

- the total number of branches of the 12 commercial banks throughout the Kingdom had reached 1208 by the end of 1996;
- total bank deposits increased from SR 143,3 billion in the first year of the Fifth Plan 1990 to about SR 215.4 billion by the end of 1996;
- total share capital increased from SR 17.4 billion in 1990 to about SR 33 billion at the beginning of 1995;
- total foreign assets fell from SR 93.2 billion in 1990 to SR 67.5 billion at the end of 1996.

These indicators show the strong financial position of the commercial banks at the beginning of the Sixth Development Plan. This will enable the banks to increase their contribution to the

implementation of the plan's objectives through the development of finance to meet the needs of both depositors and borrowers and through the expansion of long-term loans of finance investment in large development projects. (Sixth Development Plan, 1995)

3.5 The Saudi Capital Market Intermediaries

As commercial banks in Saudi Arabia are geared towards short-term lending, until the financial market system is well-established the banks cannot provide medium-term or long-term credit for the amounts needed for effective economic growth. Thus, government specialised credit agencies will continue for the time being to effect the appropriate mix of private and public sector credit activity.

The internal capital market inter-mediation in Saudi Arabia is dealt with via specialised government credit or funding agencies, a quasi-private investment bank and the informal stock market which offers additional capital funding sources. These intermediaries are controlled by SAMA, the Ministry of Finance and National Economy, and the Ministry of Commerce. The capital market in Saudi Arabia, providing primarily medium and long-term loans and equity investment, provides the basis for long-term economic

diversification and is the key for private sector financial development.

3.6 Government Specialised Credit Institutions (SCI)

The important step for carrying out government support for private sectors financial system development are the specialized credit institutions (SCI) . The main purpose for these SCI was to extend credit to the private sector in different directions. These institutions are:

- 1) The Saudi Arabian Agricultural Bank (SAAB);
- 2) The Saudi Credit Bank (SCB);
- 3) The Public Investment Fund (PIF);
- 4) The Saudi Industrial Development Fund (SIDF);
- 5) The Real Estate Development Fund (REDF).

These specialised credit agencies were formed during the First Plan period (1970-1975) in order to provide an effective vehicle for long-term government investment including:

- equity and loan support for major primary industries;
- medium and long-term loan support for secondary industries;

- interest-free individual and commercial housing loans;
- agricultural development loans;
- credit support for local contractors;
- training and equipment loans for individuals commencing a business or trade. (The first Development Plan 1970; Abdeen and Shok 1984)

However, these agencies are not considered competitive with commercial banks, but they give valuable support to the country's capital growth as they provide medium to long-term interest-free loans, with a small handling charge, of about 3%. For example, the Real Estate Development Fund (REDF) has responsibility for funding a considerable part of private sector individual and commercial housing and borrowers are entitled to a 20% discount on their annual repayment premium if they pay on time and an additional 10% discount for earlier settlement.

The total loans provided by the SCI during 1990 was SR. 4.3 billion and during 1995 SR. 6.5 billion and the repayment of their loans totalled SR. 8.2 billion and SR. 6.4 billion respectively and the outstanding loans at the end of 1990 was SR. 159.5 billion

while at the end of 1995 was SR. 151.7 billion.(SAMA, 1990 and 1996)

The Public Investment Fund (PIF) and the Saudi Industrial Development Fund (SIDF) have a key role in effecting economic diversification as well as expanding long-term credit base in Saudi Arabia and the future secondary capital market which is necessary for completion of country's financial system. For example, the PIF provides loans for financing and equity participation in a range of economic development projects. (Abdeen and Shook, 1984)

During the Fourth Plan period, PIF provided a total loan of SR 63.5 billion, to development projects 27% of the total specialised credit institutions' contribution. In 1990, the loans provided by PIF amounted to SR. 76.2 billion [including electricity loans of SR. 37.9 billion] . (Ministry of Planning, 1990 and SAMA, annual report 1990)

The Saudi Industrial Development Fund (SIDF) carries out an important duty in promoting private capital investment in electricity generation and various secondary industrial projects. During the fiscal year 1990, SIDF gave industrial loans of SR. 648 million of which SR. 254.8 million went to the chemical in-

dustry, SR. 115.1 million to the metal products industry, and SR. 55.9 million to the paper products industry. The three industries accounted for 65.7% of total loans during the year (SAMA, annual report, 1990).

The most significant achievement of the specialised credit institutions has been the promoting of local investment and the formation of the first phases of a significant long-term credit development programme in Saudi Arabia. This could lead to the eventual expansion of the internal capital and secondary financial instruments market.

The most of the SCI achieved a greater level of self-financing, during the Fifth Plan period, the outstanding loan repayments were enough to meet their new lending activities to private sector.(Ministry of Planning, 1990)

3.7 Government Secondary Investment Sources

Apart from government support to the private sector, there are two government sources involved with equity investment. Firstly, the General Organisation for Social Insurance (GOSI), which is

structurally controlled by the Ministry of Labour and Social Affairs. It supports development projects in the private sector and is involved in the capital ownership of various Saudi joint stock companies, e.g. 10% of Saudi Public Transport Co.(SAPTCO), Saudi Kuwaiti Cement Co., Yanbu Cement Co., and 8% of Saudi Investment Bank (SAIB). In addition, it owns about 5% of the share capital of another seven Saudi joint stock companies.

The second source is the Retirement Pensions Agency which is controlled by the Ministry of Finance and National Economy. It participates in development projects to encourage private sector involvement in the development process. It also has about 5% of the share capital in both Saudi Real Estate Co. and Taibah Co. For Investment, and it owns 10% of the share capital of Saudi Kuwaiti Cement Co.

3.8 Private Credit Institutions

The Private Credit Institutions are controlled by the Ministry of Commerce, to provide short-term finance for household and small companies.

An additional capital market institution, theoretically a commercial type bank, is geared towards investment rather than commercial banking. The Saudi Investment Banking Co. (SIBC), was established by Royal Decree in June 1976 to encourage private sector economic development by giving long-term, interest-free, equity-type financing for Saudi industries, to conduct feasibility studies for proposed projects; to help in project development and to supplement short-term bank lending, SIBC shares are split among three groups: the Saudi public (36%); the Saudi sponsors, National Commercial Bank (NCB), Riyadh Bank, Bank Al-Jazirah, and the General Organisation for Social Insurance (GOSI) (29%); and foreign sponsors, Chase Manhattan Overseas Corporation, Industrial Bank of Japan, and J. Henry Schroder Wagg & Company 35%. (Abdeen and Shook, 1984)

SIBC specialises in the provision of medium and long-term finance and offers a full range of corporate banking services including the issuing of letters of credit and guarantees, depository and investment services, foreign exchange and cash management.

3.9 Summary

As seen from the above the financial system in Saudi Arabia is supervised by SAMA which is controlled by the Ministry of Finance and National Economy. SAMA carries out the general functions of a modern central bank. One of its most important functions is the day-to-day control of share trade activities which are conducted through the commercial banks.

The Saudiization programme has been forced the commercial banking system in more than twenty years ago which they were formed into joint stock companies with Saudi participation of 60% of their capitals this programme was completed in 1982. In same time the commercial banking system has developed considerably over the last twenty years

An important role has been played for a long time by the money exchangers who acted without regulations as money market intermediaries in Saudi Arabia. By 1983 SAMA had regulated their activities and subjected them to the commercial banks' regulations to control their role in the future development of the private financial system.

Finally, the government-specialised credit institutions and the two secondary government investment sources have played an important role in the capital market to support the private sector by deferent directions.

The next chapter provide a review about financial markets and their classification with focus on stock market and shares classification.

TABLE (3.1) COMMERCIAL BANKS OPERATING IN SAUDI ARABIA

Name of Bank	Head Office	Number of Branches
1-The National Commercial Bank	Jaddah	244
2- Riyadh Bank	Riyadh	178
3- Saudi Cairo Bank	Jaddah	68
4-Al-Bank Al-Saudi Al-Franci	Riyadh	58
5-The Arab National Bank	Riyadh	117
6-Saudi British Bank	Riyadh	65
7-Bank Al-Jazira	Jaddah	13
8-Saudi American Bank	Riyadh	46
9-Al-Bank Al-Saudi Al-Holandi	Riyadh	37
10-United Saudi Commercial Bank	Riyadh	19
11-Saudi Investment Bank	Riyadh	11
12-Al-Rajhi Banking Investment Co.	Riyadh	352
Total		1208

Source : SAMA, Money and Banking Statistics, 4th Qtr. 1996.

Chapter Four

The Classification of Financial Markets

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4.1 Introduction

The purpose of this chapter is to review the literature concerning the classification of financial markets. The concept of emerging stock markets and their definition will also be covered to give an idea about the capital market situation in less developed regions of the world. This chapter will also cover the definition of financial markets and their classifications. This includes the money and capital market, the primary and secondary market, the Stock Exchange and Over the Counter Market.

This chapter is an introduction to the following chapter, which will cover the structure of the Saudi Stock Market. All the theoretical literature on the financial markets classification, as mentioned above, will be included in this chapter.

4.2 Emerging stock markets

The term “Emerging Market” was first used by officers at the World Bank International Finance Corporation (IFC) when they started to work on the concept of country funds and capital market development in less developed regions of the world. An emerging stock market (ESM) can be variously defined. Speidell and

Sappenfield (1992) defined an ESM as any stock market for which share price data are available through the IFC . But Wilcox (1992) defined an ESM as a stock market located in a country with low per capita Gross Domestic Product (GDP). Deveci, Drach and Stefek (1992) considered an ESM to be the market where companies' shares are publicly traded but which is not a developed stock market. According to the IFC "emerging" suggests that a market has begun a process of change, growing in size and sophistication, in contrast to markets that are small and give little appearance of change. Another definition of "emerging" can refer to any market in a developing economy, with the implication that all have the potential for development. Just as most low-and middle-income economies are considered to be developing, regardless of their particular stage of development, all stock markets in developing countries are considered to be emerging. The following show the criteria of the World Bank in classifying economies as low-income, middle-income or high-income:

- Low-income economies are those with a GNP per capita of \$695 or less;

- Middle-income economies are those with a GNP per capita of \$696-\$8625;
- High-income economies are those with a GNP per capita of \$8,625 or more.

According to the Word Bank report in 1990, the fastest rising stock markets in the world were those emerging in the developing countries . However, these markets have long been characterised as having higher risks but also higher returns than developed equity markets. Since 1991, most investors in these markets have focused primarily on the high returns available. In 1994 many emerging markets experienced dramatic price swings and most markets ended the year at lower levels.

Emerging markets also showed signs of increasing maturity in terms of their capital-raising power. The total value of shares traded jumped from less than 3% of the \$1.6 trillion world total in 1985 to 17% of the \$ 9.6 trillion world total in 1994 (Arestis and Demetriades, 1997). New issues of stock for cash rose from 2.000 in 1993 to over 2.800 in 1994, while total value at \$51.4 billion versus \$37 billion in 1993, and as individual example in Saudi Stock market witnessed a significant rise in trading activity during

the year. The number of shares traded in the market rose from 35.2 million in 1992 to 152.1, 137.8 million in 1994, 1996 respectively. The total value of shares traded increased from SR.13.7 billion in 1992 to SR 25.4 billion in 1996.

4.3: Financial Markets Classification

There are many ways of classifying the financial markets. One way is by the maturity of the securities traded in the market. For example, there is a financial market for short-term debt instruments, called the “money market”, and one for longer maturity financial assets, called the “capital market”. The money market is made up of securities that mature in one year or less, such as short-term debt securities traded in the money market. While both the money and capital markets supply liquidity for the investor, money market securities have little or no risk of default and do not contain significant price risk due to their short maturities.

Financial markets may also be classified by whether new securities are being sold (primary markets) or already-issued securities are being bought and sold (secondary markets).

Both markets can be further divided into stock corporate bond, government bond, futures, commodities, options and other types of markets. The secondary market can be classified by its organisational structure as an "Organised Exchange" or an "Over The Counter" (OTC). (Valentine, 1985; and Struthers and Speight, 1986)

To give some sense of the capitalisation of the secondary world stock market , it grew from \$4.7 to \$15.2 trillion between the mid-1980s and mid-1990s. Another example, in Saudi Arabia consider that in 1991 shares owned by individuals were worth an estimated SR. 8.5 billion which increased to SR. 25.3 billion by the end of 1996.

4.4 Money and Capital Markets

As already mentioned, the financial market is classified into money market and capital market. The main distinction between them is based upon the maturity of their financial assets. Money market can be identified with the "short-term market" where short-term instruments (of one year's maturity level) are traded, with most of these instruments being loan instruments issued by banks, financial institutions and corporations. Such instruments

can be commercial papers, offshore accounts, banker's acceptance, certificates of deposit, bills of exchange, trade acceptances, re-purchase agreements and inter-bank or inter-company loans. A money market also includes some debt security instruments such as treasury bills or treasury certificates, issued by government or its agencies, and financial company promissory notes. A money market can be further divided into retail market for a deal of modest amounts of money and wholesale market for considerable sums of money (Cox 1986). Peter Mole (1982) defines capital markets as: "the means of allocating the nation's savings to finance long-term investments by reconciling the demand and supply of capital assets."

4.5 Primary and Secondary Markets

Both money and capital markets have two major sections within which another classification of financial markets can be considered. The two main sections within capital markets are the primary and the secondary market. The primary market is the market where new issues of shares and bonds are sold to the primary holders (Smith et al., 1992). New issues can be either as

"flotation", that is when issued by newly formed companies which have never had their shares traded, or as "secondary issue" for companies who have already sold part of their share to the public at an earlier date. (Polehill, 1987)

Therefore, the primary market is a market where shares and bonds are traded between issuers and primary holders.

On the other hand, the secondary market trades among holders, shares and bonds which were issued long ago. Securities exchange in the secondary market is conducted through the organised stock exchange or one of the other three markets which are over-the-counter, unlisted securities and the third tier market. Within a capital market, a mortgage is dealt with solely in the primary market since there is no secondary market for it. The two divisions apply to money markets as well, but with different terminology. The traditional market, often referred to as "the discount market", since the discount houses and deposit banks are its chief participants, is closely and directly linked with the central monetary authorities.

4.6 Loans and Securities Markets

Financial markets can also be classified into two market groups of which loan markets represent the first group. In this group, in addition to mortgages, loan instruments of the money markets are traded. Loans instruments are directly negotiated between lenders and borrowers and are generally not re-saleable, nor transferable in a secondary market.

The securities markets represent the second group where government treasury bills, notes, bonds and corporation bonds are traded, as well as shares of all types. The main deferent from those securities is that they are marketable instruments which can be traded in a secondary market. Bills, notes and bonds are considered as debt securities instruments while shares are equities securities instruments. The main distinction between the debt securities instruments is based upon the maturity date. Bonds are issued with a life of seven years or more; in fact, many are issued with a life of thirty years and over.

As securities markets are being widely developed, an option market and future market have been introduced and expanded in the USA and other regions. An options market is simply a market

where an option contract is conducted. The contract gives an investor the right either to buy or sell a specified quantity of shares at a pre-arranged set price at or before a specified future date in return for the payment of a premium. There are conventional (non-traded) or traded options. The former can be called option (to buy), put option (to sell), or double option (two-way or put and call). These options are considered to be the most sophisticated vehicle in the securities market. Traded option applies to money markets instruments mainly in the offshore accounts. A futures market is a market in which future contracts in financial instruments are traded. (Stapley, 1986)

4.7 Classifications of Shares

The term “share” is simply defined as a share in the ownership of a company. Alternatively, it can be said that a share is a portion of the owner’s capital in a business, hence it is considered an equities security. In the United States, the term “share” is referred to as common stock while in Britain the term “stock” is frequently used in relation to fixed interest securities. For equities securities, the term 'ordinary share' is used. The term represents the most common type of shares. Other types of

shares, including deferred shares, non-voting shares, partly-paid shares, preference shares and redeemable preference shares confer varying rights on the existing share-holders. (Valentine, 1985)

Other classifications of shares are based on company size and performance as well as share price and yield. The types that fall into these categories are blue chips, penny shares, growth shares, high flyers, and recovery shares (Nikki, 1986). Blue chips apply to shares in well-known, prestigious, safe and very big companies. The Big Bang System of the UK registered these shares as "Alpha" shares. Penny shares are those of a very low level or "weight" of share price which usually start at less than 10p in the UK where they are commonly traded. Growth shares are those expected to achieve above average increases in their capital value, earnings and dividends as the result of the company's prospects. Growth stock is the term used in the USA. High-flyer shares are those of high yields. Recovery shares are those whose prices are well below levels seen in the past. They are considered one of the most challenging styles of investment. Nikki (1986) split recovery shares into three distinct categories. First, a cyclical concern at the ordinary (temporary)

nadir of its fortunes. Second, a company in real trading and/or financial difficulties. Third, a rapidly growing company which has temporarily fallen out of favour, may be because investors expected too much.

However, shares of all types represent the risk capital of a business and the shareholders sharing the success and the failure of the business; which is usually reflected in the dividend and the share price quoted in market. It is the ordinary share-holder who represents the total risk taken in any business. As a result, if a business fails and becomes insolvent, or if it has been sold then the ordinary shareholder will be last in the queue to claim back any money. The more superior preference shares, however, give the holder a prior claim on the business earnings. The preference shareholder also has a right to dividends at a specified rate, when declared by the Board of Directors, before the ordinary share dividends. There is a priority, too, for the preference shareholder in the event of the liquidation of a business.

4.8 Stock Exchange and Over the Counter

Markets

Apart from the secondary market, there is a stock exchange an organised physical market for securities exchange, and it's the main function which provides the mechanism for the exchange of shares which already exist (Midgley and Burns, 1977). In other words, it is an organised market place for "second-hand" securities instruments issued by public limited companies, government or government agencies, and which have been listed with the exchange to be traded on the exchange floor after accomplishing listing requirements.

The exchange is a two-way auction market where buyer and seller meet through their brokers to achieve the best possible price on the shares transaction. The exchange itself neither buys nor sells securities. It merely provides a trading place where exchange members act as agents for their buyers and sellers or to buy and sell for themselves. When doing this they are called "market makers". The stock market is financed by private capital and administered by an elected council of members.

The over-the-counter market is not a physical market but because the stock exchange handles transactions of the Over the Counter (OTC), it has to trade for the rest. Any securities deal that listed securities negotiates and does not take place in an exchange is said to be an over-the-counter trade. (Fischer and Jordan, 1991). As Valentine(1985) says, the phrase, "over-the-counter" appears to originate from private bank counters since the 1870s, when securities in the United States could be bought through recognised private banks as well as via a stockbroker. The phrase over-the-counter, therefore, passed into the language to differentiate between securities bought from dealers and recognised stock exchange.

Prices in the OTC market are quoted by dealers on a bid-asked basis. In the UK, in addition to the OTC market, there is the Unlisted Securities market which consists of shares of relatively young or small companies that did not have to meet the stock exchange requirements for traditional full listing. There is also a third tier market for shares in highly speculative smaller companies. (Levane, 1987)

In the USA there are third and fourth markets. The third market is an over-the-counter market for shares that are also listed on a stock exchange. In other words, it deals with listed securities, but off the stock exchange. The fourth market is similar to the third market in this function. It differs from the third market in the sense that trades take place without the help of a dealer. It comprises large institutions which trade shares directly among themselves. (Scott,1981). Figure 4.1 shows the various classifications of the financial market.

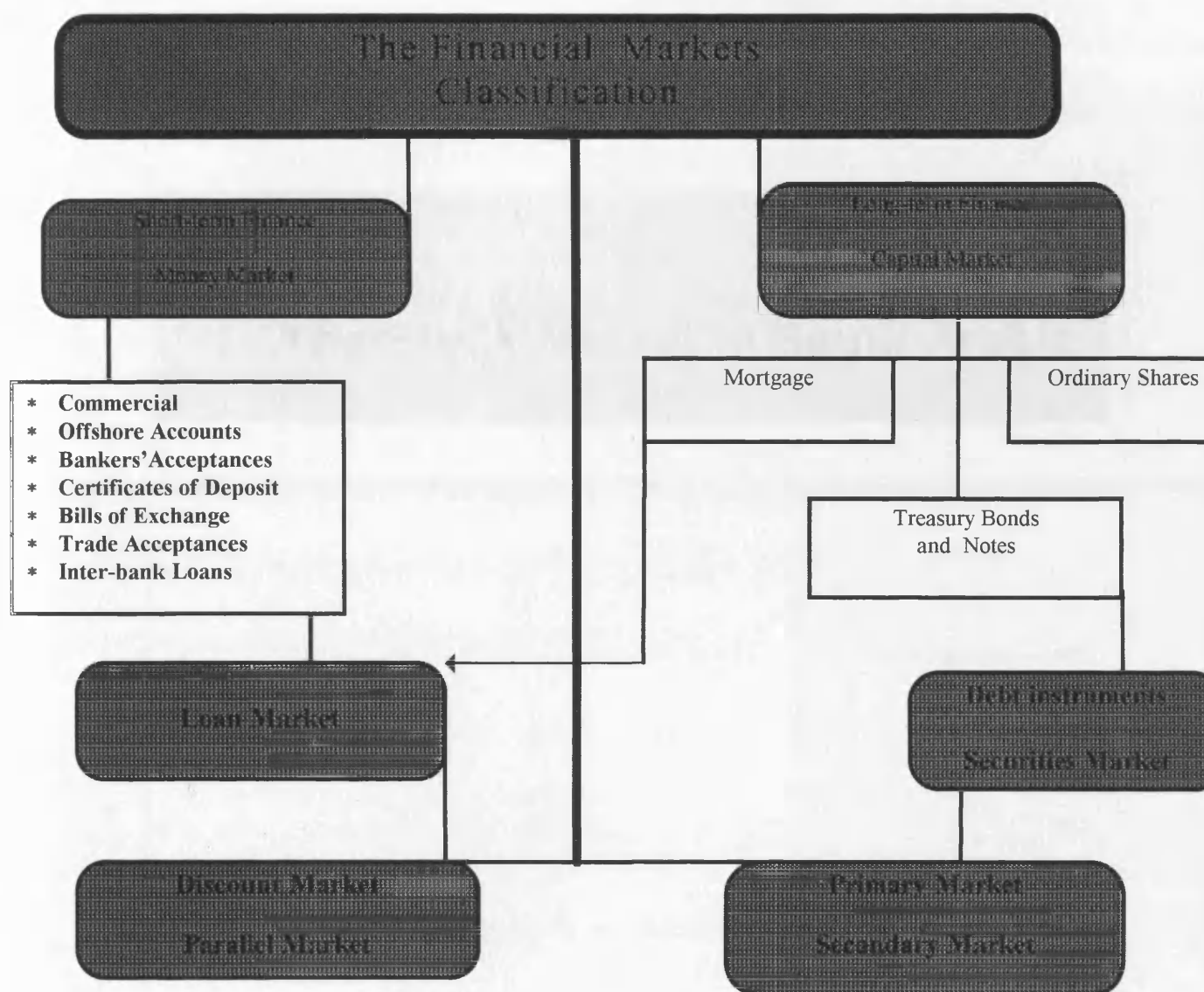
4.9 Financial Intermediaries

These can be defined as a set of institutions which channel indirect investment and financing. Some savers, rather than purchasing the direct financial instruments of the borrowers, invest their savings with a financial intermediary and receive financial claims of the intermediary. They in turn take savings in relatively small amounts and reinvest them directly in a diversified shares portfolio or by making large amounts available to be borrowed by companies in need. They are doing so not as agents, but as principals. Their contributions to the financial markets effectively

gives security and risk protection to some extent through the pooling of savings and diversification of portfolios. (Diulo, 1987)

In the following chapter the Saudi Stock Market and its structure; organisations and regulations will be covered.

Figure 4.1 The Classification of the Financial Market



Chapter: Five

The Stock Market In Saudi Arabia

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5.1 Introduction

Before the Saudi Stock Market was established, research studies were undertaken for several years. But due to the government's concern about stock market excesses in other Gulf states and other development problems, there has long been an interest in establishing a formal stock exchange. Furthermore, the idea received great support from government and private institutions and regional national businessmen's groups, chambers of commerce and bankers who argued that, in general, a stock market would provide an important element in the generation of private sector capital required in the next stage of economic development. (Abdeen and Shook 1984)

When the Saudi stock market became officially regulated in 1984 there were only 40 public traded companies. By the end of 1996 the number of companies rose to 89 companies which have shares traded in the SSM to a total capitalisation SR. 153 billion.

This chapter provides an overview of the Saudi stock market (SSM), discussing the primary and secondary markets, the shares

negotiation system, types of order and the mechanism of the secondary market. Also discussed are the activities of the official and unofficial brokers as market makers, the sources of information available for investors, the market indices and finally the growth of the SSM.

5.2 The Primary Market

The Arabian Automobile Company (AAC) was formed in 1934 as the first joint stock company in the country, which constituted the first company of the primary market under the commercial Law of 1931.

Although the number of joint stock companies had risen to 17 by the end of 1964, there were no complete regulations to govern these companies. The only provisions of the regulations governing these companies consisted of a few articles set forth in the regulations for the Commercial Court.

In 1965, for the first time the government brought in a Companies Act, comprising 234 articles, which contained a comprehensive range of regulations to control the functioning of joint stock and other types of companies and the regulations of the

primary market through 100 articles concerning the procedures for establishing a new joint stock company and issuing the financial instrument.

Through those regulations the joint stock company can issue, in addition to ordinary shares, preferred shares of stocks with a par value of SR100, or to convert common shares to preferred shares of stocks. In addition shares remain the only instrument issued by joint stock companies. The Act also includes the rules which control the board of directors, the regular general meetings, the company's final accounts, and the obligations and benefits of the shareholders. (Article 103 and Felmban 1989)

The Act arranged how shares obtained through the primary market should either be a new issue for new or existing privatised companies which never before traded their shares. They may also be a secondary issue for companies which have transferred a part of their ownership to the public at an earlier date.

According to the Companies Act, the establishment of a joint stock company is subject to a specific procedure and specific

objectives based on market and feasibility studies. The company founders (the principal shareholders) are responsible for :

- Conducting the required initial feasibility and market studies;
- Providing financial forecasts;
- Procuring the necessary operational and technical support.

With these plans, they approach the Ministry of Commerce to secure licensing as a joint stock company. The Ministry of Commerce has a committee to evaluate the principal shareholders' efforts. If approval is granted, the committee approves the capital requirements and the number of shares to be sold at par value.

The Act requires the prospectus to be published in a daily newspaper at least five days prior to the date of the offer. Only Saudi nationals may subscribe in a joint stock company. Recently the Gulf Co-operation Council (GCC) has proposed a law allowing nationals of GCC states to participate in publicly traded companies in other GCC countries. (Companies Act 1982)

According to article 100 of the Act, share subscriptions should open to the public over a period of several weeks, with local banks acting as intermediaries in selling the shares. The principal shareholders are prohibited from selling their shares until the company is operational and two years of financial statements have been reported to the public, in order to protect the public from insider abuse. At the share deadline, all applications are sent to the financial consultant office, which has been assigned by the joint stock company to undertake the share allocation on behalf of the company. The office will then submit three alternative share allocation equations to the Ministry of Commerce, which will approve the option it considers to be in the best public interest.

The offer in the primary market in share subscriptions differs from the underwriting form which exists in the international capital market. It is based on "all or nothing", where the selling company and the intermediaries (banks) need not sell any of the offer unless all the shares offered can be sold at the established price. This is to avoid any loss of confidence and provide stability in the market. (Ba-waidan 1994)

The formation of the joint stock companies, and the increase in the issued capital of these and other companies during the period of the Second and Third Development Plans (1975-1985), have been essential to the development of the basis of the primary stock market.

The government supports the primary stock market through its secondary investment agencies by participating in the formation of many joint stock companies. Among the founder groups of several joint stock companies were the General Organisation for Social Insurance (GOSI) and the Retirement Pensions Agency (RPA). Also by the government specialised credit institutions (SCI), through the Public Investment Fund activated the development of the primary market by investing a great portion of their funds in the formation of the joint stock companies. Also the private sector including the local commercial banks, the money changers, and the other institutional investors, as private financial sources, were heavily involved in the establishment of most of the joint stock companies and helped to activate the primary market. The privatisation of 30% of the capital of the Saudi Basic Industries Corporations (SABIC) in 1984 activated the market when a value

of SR. 3 billion was offered by shares issued to the public.(
Felemban, 1989 and Ba-owaidan, 1994)

Although the regulations issued by SAMA in 1985 required the joint stock companies to complete the procedures for issue of share certificates within a maximum period of two months from the date of the Minister of Commerce decision which declares the formation of the company, the major problem in the primary market has been the delay in issuing share certificates after the close of the subscription. (SAMA, 1985)

5.3 The Secondary Market

As a result of the primary market foundation, the secondary market transferred the shares between investors. But during the 1970s, the transfer of the shares investment was very weak as most of the public were more interested in real estate investment. The market became active after 1977 and gradually grew after the establishment of the stock exchange in Kuwait and Jordan. In addition, investment on the stock market then became a very attractive alternative to investment in real estate, which reached its peak in 1980.

The implementation of the government's development plans helps the secondary market to be active in terms of transactions and marketability. Connected with events which accelerated the activation of the market were the electricity companies merger, the privatisation programme of local banks, the distribution of good dividends by the existing joint stock companies, and the formation of many new joint stock companies in several sectors. (Felemban, 1986)

According to traditional procedure, shares trading in the secondary market was based on the direct negotiation system, whereby both the seller and the buyer exchanged the shares against the payment in front of the company concerned. Later, a brokerage negotiation system developed; about 80 stockbrokers were informally putting sellers and buyers of stocks in touch. These brokers had no license, capital or credential requirements. Trading in the secondary market remained unchanged until the end of 1983.(Felemban 1989 and Ba-owaidan, 1994)

Due to the collapse of the Kuwaiti stock market, "Souk Al-Manakh", the government issued regulations to control and monitor trading activities in the secondary market, with the aim of

avoiding the kind of speculation which was considered a factor in that collapse. However, trading control was left in the hands of the Saudi banks.

In April 1983, a Royal Decree (No 1320/8) approved the formation of a joint ministerial committee, including delegates from the Ministry of Finance and National Economy, the Ministry of Commerce, and the Saudi Arabian Monetary Agency (SAMA), to study and review the Saudi stock market, especially the secondary market. The committee recommended not only the establishment of an organised stock market, but also that the government should introduce measures to avert the risk of a market crash due to the high level of speculation. This committee issued new rules and regulations to control and supervise the Saudi Stock Market (SSM) as a new system for trading in shares of the Saudi joint stock companies through share departments in Saudi commercial banks. In June 1984, SAMA circulated these regulations to all commercial banks in Saudi Arabia which were responsible for all negotiations and dealing pertaining to shares in Saudi joint stock companies, as of 1st January 1985. (Abbden and shook 1984)

The implementation of the new system placed the control of both the capital and money markets into the hands of SAMA, and showed a great deal of confidence in the commercial banks and the brokerage business.

The implementation of the new system required the establishment of the following departments (SAMA, 1985 and Malaikah, 1990):

a) A supervisory body for all securities trading. This is a committee whose members are representatives from the Ministry of Commerce, Ministry of Finance and National Economy, and SAMA. Its main functions are: to supervise negotiation transactions and monitor compliance with the instructions issued by the ministerial committee; to review directives and rules regulating negotiation transactions; to promote development and increased efficiency by exercising its right to request the necessary financial information either from the commercial banks or from the joint stock companies; and to set a ceiling on the share trade of a particular company, or hold the negotiation of its shares, in the public interest. This committee meets regularly to

review market conditions and reports to the ministerial committee which has the power to issue new rules for the market.

b) Shares Control Administration Department (SCAD) under the jurisdiction of SAMA to handle day-to-day securities trade control. This department monitors the working hours for share negotiation in the Central Negotiation Units (CNU) in the commercial banks. These have been set at two hours each morning, from 10.00 am. to 12.00 noon, and two hours each afternoon, from 16.30 PM. 18.30PM on Thursday, when there is no trading in the afternoon, as the commercial banks work only a half-day and Friday, when there is no trading at all, Friday being the day off for the banks and government. SCAD is involved in the appointment of personnel to the bank's CNU's, analyses the daily negotiation transactions received from the CNU's, and circulates the ministerial committee's and supervisory body's instructions to the companies and banks. It also reports the share price list and the daily and weekly financial summary to the local media, and issues briefing brochures in the public interest.

c) Securities trading company. Share trading under the new system requires a clearing house after trades are executed. Thus,

in 1985, the twelve commercial banks operating in Saudi Arabia jointly formed the Saudi Shares Registration Company (SSRC), based in Riyadh, with a total capital of SR. 11 million shared equally between them. SSRC was formed in accordance with SAMA's instructions in order to provide share registration and transfer services to the joint stock companies, including the twelve banks themselves. This company is responsible for all brokerage activities, constituting a central unit to co-ordinate buying and selling orders between CNU's in the banks. The CNU's in Riyadh have direct access to the central unit of SSRC. The company acts as an integrated central registry for all shares traded in the market. In addition, its other functions include:

- Monitoring the issue of shares and signing share certificates upon issue;
- Receiving, recording and dealing with probates, succession certificates, powers of attorney, dividend receiving mandates, powers vested, certificates of death, and other documents affecting the title to the shares;

- Publishing and dispatching circulars and invitations to meetings, reporting financial statements;
- Handling and classification of proxies;
- Maintaining statutory periodic returns required by company law.

5.4 Share Negotiation System

The share negotiation system (SNS) is defined as a sale or purchase negotiation of shares of Saudi joint stock companies fully owned by Saudi citizens or corporate bodies, as well as companies with a foreign participation. Shares may only be acquired by Saudi citizens, except in special circumstances. According to the system regulations, the staff of the commercial banks undertake the negotiation between the seller and buyer, or their duly authorised agent, and the commercial banks should have a Central Negotiation Unit (CNU) located in Riyadh and Branch Negotiation Units (BNU) located in the other cities of the country. Commercial banks are not allowed to take positions in share

negotiations. The system incorporates some restrictions to protect market trading.

Only shares of Saudi companies can be transacted in Saudi Arabia. Recently, Arab National Bank was given the go-ahead to launch the first fund for local investment, with around 30% to be placed in Saudi shares. Non-Saudis may invest in this fund, and other banks in the country have been allowed to launch similar funds.

In April 1997 the American Bank has been allowed by SAMA to establish an investment fund for non-Saudi citizens, and according to the SAMA governor, this will be an attempt to globalise the market and will allow other banks to do the same.

5.5 Types of Order

A limited order and a market order are the only types of order in the market; in the first the client determines a specific price for any share he wishes to sell or buy, and in this case the bank cannot change the price without the client's permission. But, for the second type the client authorises the bank to sell at the best price available or to buy at the lowest price demanded.

5.6 Mechanism of the Secondary Market

SAMA issued an internal operating rules manual to be used by all banks to deal with share transaction which contained follows: those wishing to buy or sell shares in the market would approach a negotiation unit at the branch of any commercial bank and complete an application form indicating amount and preferred prices. The application form also contains the identification data of the client, name of the company, method of payment (cash, certified cheque or debit to the account), and the provision whereby the client authorises the bank to carry out the transaction on his behalf, in accordance with the conditions stipulated in the order.

As required by SAMA regulations on share trading, the CNU, which undertakes the sale transaction, has to provide SAMA with a copy of the processing order, along with a share certificate, so SAMA can verify and record the transaction data for the market information system, then send it to the SSRC for the ownership transferring, and pass it to the clearing office within SAMA for payment clearance if two bank's CNUs were involved.

Banks charge a maximum commission of 1% of the value of the shares traded, split equally between the buyer and seller. This charge covers the cost of registering the transaction and transferring the ownership of the concerned shares.

Another channel for share trading is through the companies, when share traders prefer to trade their shares through the company and save the commission that banks would charge for the transaction. Consequently, joint stock companies are required by the system to submit to SAMA a daily statement showing share ownership transfers occurring as a result of direct negotiation between sellers and buyers before the company. Sometimes a large number of transactions are routed through companies rather than through bank branches or through brokers, especially if the buyer and seller were already identified to avoid the commission payment. (Ahmad, 1989)

5.6.1 The Electronic Securities Information System

The Electronic Securities Information System (ESIS) was, a new off-the-floor screen trading system, introduced by SAMA in August 1990 to run parallel with the Share Negotiation System

(SNS). ESIS is a computerised dealing scheme which will allow greater liquidity in the market. There are no brokers and banks are forbidden to act as market makers. According to SAMA, (1990) the objectives of ESIS include:

- (i) concentrating the market which at present spreads across different banks;
- (ii) narrowing the “bid-ask” price spreads; and
- (iii) improving market liquidity and the appearance of fairness which is important for small investors.

SAMA fully implemented the new system for share trading in the stock market in Saudi Arabia by extending the system in (1993) through the ESIS`LINE and the ESIS`PC and ESIS`NET services.

The ESIS`LINE provides up-to-the minute market information, including company announcements, to be used by banks which can disseminate information to their respective branches.

The ESIS`NET allows banks to transmit all orders from bank branches to ESIS this ensures that all regional investors get fair

treatment in the execution of their orders. SAMA identified the main features of the ESIS-NET service as follows:

- Computerised links allowing banks to access ESIS directly through networks;
- Validation of sell and buy orders and acceptance into ESIS in the same manner as orders at the Central Trading Unit at banks;
- Information of orders and bid-offer is captured by the ESIS-NET service so as to make information available for reporting to internal bank systems;
- Electronic transfer of trading, settlement, clearing data and receipt of ownership back to the originating bank.

5.7 The Official and Unofficial Brokers

Before the new shares negotiation system issued the early unofficial-brokers had no qualifications or credential requirements and ran their business at minimum cost. Their main motive for involvement in share investment was speculation. Brokers

operated their business with a trade commission license which did not specifically cover share dealings, because there was no license for such business at that time.

However, brokers played the role of market makers and share traders, rather than brokers looking for commission. Due to the absence of an official brokerage system for share dealings, brokers had dual functions. A broker could act as an agent on behalf of his client and as a dealer buying and selling shares for and from his own account.

When SAMA accomplish the new share negotiation system in 1985 and handed all the brokerage business to the commercial banks, it specified that the function of the broker was as a middleman, executing share orders on behalf of the bank's clients. The system laid down conditions for the appointment of the middlemen, whether in the central negotiation units or in the branch negotiation unit. A middleman must be a Saudi national, highly qualified, never have been the subject of any criminal proceedings, and be adequately trained prior to assignment in negotiation transactions.

Commercial banks were unable to undertake the brokerage activities properly when the new system was implemented because of a shortage in qualified staff, and a great number of staff had to be trained to carry out the negotiation transactions, both in the CNU and in other branches. Meanwhile, the general public had little confidence in banks. Eventually, the banks were forced to make a covert approach to the unofficial brokers, requesting their help and experience. Thus, those brokers started to activate the market by buying and selling blocks of shares in their own names on behalf of unknown clients.(Ba-owaidan, 1994)

5.8 Information Sources

Because the shortage in the official disclosure of information, most investors have private information sources, but in general, financial information is made available through the local press and by direct distribution from the joint stock company to its shareholders. The Companies Act requires corporations to report their audited annual balance sheets, income statements, the company's operations and financial position, and the method by

which they propose to distribute net profits to the public, through at least one of the local newspapers. Companies are also required to report their annual statements to the Share Control Administration Department (SCAD) and the Ministry of Commerce. The latter has a division which keeps up-to-date, accurate basic structural data on all corporations and their financial annual statements for the public use. By law, the company's board of directors are not allowed to disclose inside information to the shareholders or to the public, except at the time of the annual general meeting.

Although the Companies Act requires companies to report their financial statements annually, SCAD requires companies to report their quarterly financial statements within two months from the end of each quarter. According to the ministerial committee's regulation on stock trading procedures, any company which does not comply with the quarterly disclosure requirements is subject to suspension of its share trading, in addition to the penalties stated in the Act. Some companies have complied with quarterly disclosure requirements, but the majority have not.

The share price list is a result of transaction data being sent into one pool by banks' CNU's and by the joint stock companies, when transactions are executed through the commercial banks and through direct negotiation before the company. In March 1985, the share price list was issued on a weekly basis then, in April 1986, it developed to a daily basis. It includes transaction data of all corporations that have tradable shares in the market, classified into six activity sectors. The daily list indicates the number of transactions per issue; the number of shares traded; the highest and lowest average and the last average price; the accumulation figures of the number of transactions; volume and value of traded shares; and number of companies in which shares are traded. SCAD also issues a weekly list of accumulation figures, classified by activity sector, with comparative percentages and the numbers of companies whose share prices increase, decrease and remain constant.

The daily share price list is prepared by SCAD once a day at twelve noon and shows all transactions executed on the previous day. It is distributed to all banks' CNU's, BNU's, and the local media by fax. This list is considered to be the initial source for

the weekly share price indices produced by the National Centre of Financial and Economic Information (NCFEI), which is a division under the control of the Ministry of Finance and National Economy.

There are eight Arabic-language daily newspapers and three English-language daily newspapers which have reported financial information since March 1985. One of the eight newspapers and two daily financial newspapers report daily trading information for all shares on a regular basis with details about comparative prices, transactions data, and accumulated figures.

The Chambers of Commerce and Industry in the country also make a contribution by publishing structural and financial data on the corporations, accompanied by financial analysis prepared by financial specialists and experts on the share market, such as the Consulting Centre for Finance and Investment (CCFI).

5.9 The Market Indices

The National Centre for Financial and Economic Information (NCFEI) in 1985 produced indices of the Saudi share market for the first time as a contribution to the market information system,

but these were not published until 6th March 1987. According to NCFEI, the indices system was given a two-year trial period, after which it was considered the official index of the Saudi Stock Market (SSM). The indices include a general market index and six sub-indices for the various sectors, namely financial (banks), industry, services, agriculture, electricity and cement.

5.10 The growth of the SSM

The Saudi Stock Market (SSM) has expanded in recent years whereas the value of shares traded through the commercial banks reached SR. 1.9 billion in 1988. However, the percentage of the value traded each year relative to the total value of the shares listed has decreased. (Ministry of Planning, 1990)

By the end of 1991, the total value of shares traded was SR. 8.5 billion, which increased to SR. 25.3 billion by the end of 1996, a growth rate of 290%. The total number of shares traded by the end of 1991 was 30.75 million shares, increasing to 137.8 million by the end of 1996, with a growth rate of 447% . The total of executed transactions at the end of 1991 was 90,500 transactions which then increased by 300% to 283.700 by the end

of 1996. The total capitalisation of the market increased by 12.1% to reach SR 172 billion in 1996 from 153.3 in 1995. (Azzam 1997). The companies listed during 1996 in the market were 70 joint stock companies compared with 69 joint stock companies in 1995 , that by increasing in the new shares worth SR. 732.5 million in the primary market (SAMA 1996, and Azzam 1997). Table (5.1,2,3) shows the annual movement of traded shares from 1991 to 1996, and the comparison of traded shares by sectors between 1995 and 1996 .

In the Fifth Plan period the stock market grew substantially in terms of volume and value of shares traded. However, some constraints are impeding the capital market's effectiveness in mobilising and directing savings towards investment channels, and have reduced the market's ability to absorb and trade government equity shares in some of the public sector enterprises proposed for privatisation.

However, the financial market continues to face some difficulties, such as the following :

- its restricted organisational and administrative capacity to provide services commensurate with the needs of the expanding private sector;
- the small size of the stock market with only 89 listed Saudi companies and with share dealings limited to Saudi companies and Saudi citizens, apart from exceptional cases where GCC citizens are allowed to purchase specific amounts of such shares.

The weak linkage between commercial banks (as main collectors of savings in the form of various types of deposit) and the financial market, because of the lack of suitable investment channels and diversified savings instruments that can attract various groups of savers. [The Sixth Development Plan, 1995]

As a result, the capital market will be developed within the framework of the Sixth Plan strategy for the development of the private sector through the following main policies:

- regulations will be reviewed and further developed;
- buying and selling procedures will be simplified;

- market efficiency will be increased and investor decision-making assisted through the establishment of independent sources for the collection, analysis and dissemination of data about the performance of individual joint-stock companies;
- the possibility of allowing foreigners to deal in the capital market under specific rules will also be studied. [The Sixth Development Plan ,1995]

Table 5.1 The annual movement of traded shares from 1991 to 1996.

Fiscal Year	1991	1992	1993	1994	1995	1996
Value of shares	8.527	13.698	17.360	24.871	23.226	25.397
No. of shares	30.758	35.199	60.307	152.088	116.617	137.832
No. of Transactions	90.559	272.075	319.582	357.180	291.742	283.759

Source: SAMA, Money and Banking Statistics, 4th Qtr. 1996.

5.11 Summary

We have seen in this chapter that the primary market in Saudi Arabia has existed since 1934 and that the total number of joint stock companies has increased gradually.

As a result, the government issued the Companies Act to regulate the primary market in order to safeguard public interest and protect private funds. Most companies that go public are newly established corporations with no operating history and large capital requirements, or existing companies which have been subject to the privatisation programme, or companies which have transferred a part of their ownership to the public.

In the primary market, commercial banks act as intermediaries in selling shares to the public without taking part in this process. Corporations, in accordance with the law, have to appoint a financial consultant agency to carry out the allocation process, which requires final approval by the Ministry of Commerce.

The government activate the primary market through participation in the establishment of many corporations; private

sectors such as institutional investors and commercial banks also played an important role. As a result, the public showed great interest in investing in the joint stock companies and played a significant role in the development of the base of the primary market.

The government issued new rules and regulations to monitor and control the shares trading in the secondary market in order to avoid the unofficial brokers' speculations which were very high at that time and to protect the market from the possibility of a crash such as accrued in the Kuwaiti Stock Market, (Souk Al-Manakh). The Share Negotiation system (SNS) placed control in the hands of commercial banks under the supervision of SAMA through the Shares Control Administration Division (SCAD).

The unofficial brokers focused their activities on share investment using their experience in the real estate business but without any qualification, license, or credential requirements. They were market makers rather than brokers. After the implementation of the SNS and ESIS, the official brokers in the commercial banks were entrusted with the brokerage business which affected the role of the unofficial brokers.

The official market information sources issued by SSM is the share price list, which is prepared by SCAD and published in the local media, is considered to be the most reliable source of market information. Ordinary investors rely heavily on this list, as well as on the financial statements published by the corporations and the financial analysis prepared by financial specialists and published by economic departments of the commercial banks through their monthly reports and newsletters. Chambers of Commerce and Industry and Consultant Centres also play a role through the publication of their financial reports which include useful information, such as comparative data of prices, financial data of most companies and analysis of the share market performance.

This chapter ends the review of literature dealing with the Saudi economy and its planning, the financial system in the country, financial theory, its classification and finally a review of the structure of the Saudi Stock Market. The next chapter will be the first section of the second part of this work, which includes chapters 6,7, and 8 dealing with the theory of the efficient

markets, the methodology of the efficiency test and the results of the weak-form efficiency of the SSM.

CHAPTER Six

The efficient market hypothesis

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6.1 Introduction

The main purpose of this thesis is to examine the extent to which the stock market of Saudi Arabia is efficient.

In order to achieve this, it is necessary to understand the efficient market hypothesis (EMH). For this reason this chapter is devoted to a review of the theory and empirical tests of the efficient market hypothesis.

This chapter consists of four parts. Part one is a review of the historical development of the efficient market hypothesis and its concept, definition and conditions . In part two the three forms of the efficient market hypothesis will be covered. In part three the evidence supporting the efficient market hypothesis will be analysed by reviewing the implications of the forms of efficient market hypothesis. In the final part the review of stock market in LDCs will be discussed .

6.2 Economic efficiency in financial market

The term "efficiency" in capital markets has been used to describe several distinct but interrelated concepts. These include allocational, operational, and informational efficiency.

6.2.1 Allocation Efficiency

The purpose of capital markets is to transfer funds between investors and borrowers efficiently. Individuals and firms may have access to many productive investment opportunities with returns that exceed the market determined rate at which they can borrow but not enough funds to take advantage of all these opportunities. Capital markets can provide access to the needed funds. Investors, on the other hand, may have surplus funds after exhausting all their profitable productive opportunities. The investors will be willing to lend their surplus funds if the rate of return the market will pay exceeds their opportunity cost of capital. Both investors and borrowers gain by this fund transfer mechanism. The market is said to be allocationally efficient when prices are determined in a way that equates the marginal rates of

return (adjusted for risk) for all investors and producers. (Malaikah, 1990)

If a securities market works as an efficient resource allocator , then the pricing of securities is such as to establish equivalent rates of return or cost of financing on comparable investments, i.e. comparable in terms of the risks inherent in the projects undertaken. Allocational efficiency means that securities prices will be set with the same level of risk that will offer the same expected return. This will ensure that firms that promise to pay the highest expected rewards on their securities for a given level of risk will attract funds with priority and at the lowest possible cost (Irwin, 1966 and Dixon and Homes 1995). This follows from the fact that the value of securities depends on the size of the future cash flows to be received by the investor. This accounts, of course, for the larger flow of capital to these firms and, consequently, the lower their cost of financing. As Baumol (1972) has pointed out, the economy's available funds will be directed toward those users who can make the best use of them by providing the maximum possible profits, according to the profit maximisation principle that rules the production equilibrium of the firm.

Therefore, stock prices should incorporate the perceptions of the market participants about the future earnings prospects of the firms. Thus, the ability of the market to adjust prices to reflect a long-term competitive equilibrium in the allocation of capital appears to be of utmost importance for the preservation of the allocation efficiency of the market.

6.2.2 Operational Efficiency

The financial markets, besides being allocationally efficient, should also function with technical or operational efficiency. This is the property of those securities markets where the services of raising and transacting new capital are carried out at the minimum possible cost. In other words, if the system of financial markets is organised competitively then the price of the services will tend to be low and the market will be operationally efficient. (Dixon and Holmes 1995)

The operational efficiency of the securities market could be judged by the costs which consist of the underwriting and flotation costs of new issues of securities. The lower these costs

are, the greater the operational efficiency of the market. (Stigler, 1964; Alshkali, 1989)

6.2.3 Informational Efficiency

According to the efficient market hypothesis, in an informationally efficient capital market, prices fully and instantaneously reflect all available relevant information. This means that the prices of publicly traded stocks are accurate signals for capital allocation. There can be imperfect competition in product markets and we can still have efficient capital markets. For example, an efficient capital market will correctly value a monopolistic firm on the basis of the present value of its future cash flows. By the same token, an efficient market will determine an equilibrium price for firms that implement less than value maximising decisions. Hence, product markets can be allocationally inefficient and yet capital markets can be informationally efficient. This is in order to distinguish between markets which are efficient in relation to past security prices and those which are efficient in relation to other sets of information. Fama (1970, 1976), on the basis that "all prices fully reflect all available information," defines three types of informational

efficiency. Depending on the type of information used by investors, they are: weak-form, semi-strong form and strong-form; which we will be discussed later in this chapter.

6.3: The Concept of Market Efficiency

The concept of market efficiency means the expectations of the effective investor are translated into security prices. This is particularly true where the value of securities is quickly and accurately reflected in their price. Such securities exemplify the concept of market efficiency. In an efficient market the current prices of securities represent unbiased estimates of the "fair" or "intrinsic" value of the security.

If all securities are valued fairly, regardless of which securities they purchase, investors will earn a return on their investment which is appropriate for the level of risk assumed (i.e. a "normal return"). In other words, in a perfectly efficient market, all securities are priced correctly. There are no under- or overpriced securities. Thus, the degree to which markets are efficient has important implications for investors. If markets are perfectly

efficient, time , effort, and money spent on security analysis will be wasted.

It can be agreed that some sectors of securities markets work less efficiently than others, in which case attempts at discovering misplaced securities would be better employed in the less efficient sectors. Fama (1969) defined efficient markets in terms of "fair game" where security prices "fully reflect" the information available. That is, if markets are efficient, securities are priced to provide a normal return for their level of risk. More specifically, the market is efficient with respect to a piece of information, if an investor cannot make a profit by buying or selling on the basis of that information. Conversely, the market is inefficient with respect to a piece of information if security prices do not reflect that information and if an investor can earn excess returns by trading on the basis of that information.

6.4 Definition of Efficient Market Hypothesis

As mentioned above, we can understand a general definition of the efficient market hypothesis (EMH) to mean that all publicly available information will be reflected so quickly in the prices of shares that no investor will be able to consistently earn abnormal

profits. However, as long as there exist sufficient investors with similar objectives, they will "compete away" abnormal profits so that shares will be priced to yield a normal return, commensurate with their risk. (Fuller and Farrell, 1987)

6.4.1 Conditions of Efficient Market Hypothesis

The conditions of efficient market hypothesis have been investigated by many writers. Fama (1970) and Kihlstrom and Mirman (1975) described in general terms about the conditions under which inside information will be accurately disseminated to outsiders. When "information becomes common knowledge among outsiders as well as insiders ", the writers suggest that all traders who have the same initial beliefs will agree about the expectations for the future. These conditions are:

- There are no transaction costs in trading securities;
- All available information is available without cost to all market participants;
- All agree on the implications of current information for the current price and distribution of future prices of each security.

Fama noticed that these conditions are not applicable in real life where there are transaction costs-information is costly and individuals do not necessarily agree on the implications of the information. Consequently, he states that: " these conditions are sufficient for market efficiency, but not necessary."

However, there is no need for such inapplicable conditions to determine market efficiency. The consideration which is of paramount importance for market efficiency is availability of the relevant information for an investor's decision-making . If information is available to investors and is relevant for judging securities, this information will be rapidly reflected in securities prices.

6.5 The Three levels of Market Efficiency

In order to make a distinction between markets which are efficient in relation to past security prices and those which are efficient in relation to other sets of information, three different levels of efficiency have been defined.

Fama (1965) suggests that the efficient market hypothesis can be divided into three categories: "the weak form"; the "semi-strong

form"; and the "strong form". He defines the distinctions between them (the weak, semi-strong, and strong forms of the EMH) as determined by the level of information being considered.

6.5.1: Weak-form EMH

The type of information being considered in the weak-form EMH is restricted only to historical prices. Weak efficiency means that the price of the security reflects all the past price and trading history of it. Thus, if the weak-form EMH is valid, investors are unable to earn consistently abnormal profits by simply observing the historical prices of securities (Fuller&Farrell, 1987; Fabozzi & Modigliani, 1992)

In other words, investors cannot increase their ability to choose stocks by studying the history of successive prices and by subsequent analysis. The hypothesis tested in this case is that acquaintance of the development prices or returns does not enable the investor to predict future prices resulting systematically in excess profit . In market regimes where this hypothesis stands up

well, the implication is that the goal of technical analysis becomes fruitless. (Beaver, 1981)

6.5.2 Semi-strong form EMH

The semi-strong form EMH asserts that security prices adjust rapidly (and correctly) to the release of all publicly available information. Thus, under this form the present security prices fully reflect not only all past price data but also such information as earnings reports, dividend announcements, annual and quarterly reports and news items in the financial press. In other words, any significant new public information that is available to the public should immediately be reflected in security prices consequently, if the semi-strong form of the EMH holds, then investors would be unable to earn abnormal returns by acting on such public information. Since a great deal of the information used by security analysts is available to the public at large, the semi-strong form EMH strikes at the very heart of the analyst profession. (Chen & Moses, 1992; Elton & Gruber, 1995)

The hypothesis is concerned with the testing of the speed of price reaction of the traded issues to new information. This means

that no lag should exist between the time the information becomes available and the adjustment of the stock price. Thus, if the market works inefficiently, it means that prices adjust to new information with a lag and, consequently, if one is able to determine, can be anticipated and excess profit will be reaped. (Cheny & Moses, 1992)

6.5.3 Strong-form EMH

A market is strong form efficient if security prices fully reflect all relevant information and include both public and private information. Private information implies that certain individuals or organisations, for instance corporate insiders or trading specialists, may have access to information. Thus, no investors could ever earn consistently abnormal returns; even an insider could not trade profitably from inside knowledge. If the strong form of the efficient stock market hypothesis holds, then, any day is as good as any other day to buy any stock .

The strong-form EMH represents the most extreme case of market efficiency possible. Under the strong form it is maintained

that security prices fully reflect all information, including both public and private and monopolistic information .

There are three groups of investors that have private information. These groups are corporate "insiders", stock exchange specialists, and mutual fund managers. Not many supporters of the efficient market hypothesis would argue that the strong form is a correct description of the securities markets. It should be clear that the market in the strong form is extremely demanding, which is the equivalent to perfect markets in that the market correctly prices securities at all times. As Fama (1970) noted, the strong form is: "obviously an extreme null hypothesis and , like any other extreme null hypothesis, we do not expect it to be literally true." (Fuller&Farrell, 1987; Cheny&Moses, 1992)

6.6: The Empirical Tests of the forms of EMH

In this section we will review the most important implications for the theory of efficient market hypothesis. However, these implications cover various markets including the developed and developing countries. This review would give us an indication as to the efficiency of the Saudi Stock Market.

6.6.1: Test of the weak-form

The market is weak-form efficient if investors cannot predict future stock prices by analysing past prices because all information that is contained in the past prices series is already reflected by current prices.

The main test in the weak-form has been to measure the statistical dependence between a prices. Change at day t , and the correlation between successive price changes of a security is measured.

If the price changes are random, i.e. follow “random walk”, then this provides evidence in support of the EMH. This means that no analysis of past prices can provide any useful information

about future price changes. Thus, today's price is the best estimate of tomorrow's price.

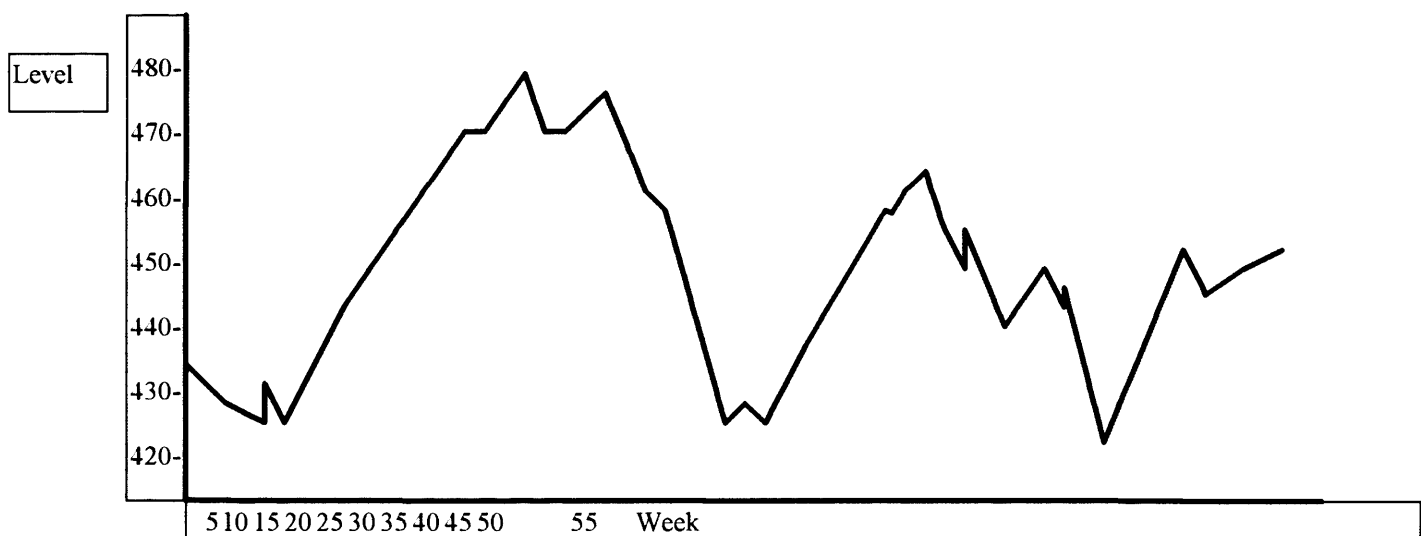
Many studies are testing whether prices follow a random walk. In the 1960s the efficient markets literature was in fact known as the "random-walk literature". It is now generally argued that prices need not follow a strict random walk, that is zero correlation between successive price changes, for the E.M.T. to be valid. Only if the dependence is so great as to permit the existence of consistently profitable trading rules will the E.M.T be invalid .

Fuller and Farrell (1987) state that a series of data follows a random walk over time means that each observation and price change is independent of the preceding observations. If stock price changes follow a random walk, then the fact that yesterday's price was up, for example, provides no information as to what today's stock price change may be. The figure (6.1) displays a graph of the simulate Friday closing prices for the Dow Jones Industrial Average during 1956. Observations such as this provided the impetus for some researchers to investigate formally whether or not stock prices follow a random walk. However, there are

many empirical tests of the random-walk model which have analysed the independence of successive prices.

The three most common tests have been used: Serial correlation's, Runs test, and Filter rules. The implications of these tests will be covered in the following sections and more information about these tests will be given in the next chapter.

Figure (6.1) Simulate Friday DJI. closing price (fuller and Farrell 1987)



6.6.1.1 Tests for Serial correlation

The most common test used to test the weak-form efficiency is the serial correlation, which measures the correlations between price changes in one period and changes for the same stock in another. If the auto-correlations are close to zero, the price changes are said to be serially independent. In other words, a serial correlation coefficient indicates how a variable is related to lagged values. For instance, to have the serial correlation for stock *k*'s price, between the observed and lagged variables would be as follows:

week	Observed price	Lagged price
1	15	16
2	16	14
3	14	17
4	17	.

From the above example we can observe that if the serial correlation coefficient is significantly different from zero, then

successive weekly price changes for stock k are related. These results would not support the random walk hypothesis.(Cheney and Moses, 1992).

In this section we will review a summary of some studies that have analysed the auto-correlations of stock price change for different times.

During the 1960s there was an enormous growth in serial-correlation testing as various researchers made use of the newly established data banks. Amongst the major studies are those by Moore(1962), Fama (1962) and Hagerman and Richmond (1973).

One of the tests done was by Moore (1962) looked at the serial correlation between successive price changes of individual stock. He collected a random sample consisting of Friday closing prices for thirty common stocks listed in New York for the period January 1951 to December 1958. He examined weekly changes and found an average serial correlation co-efficient of 0.06. which is generally small in magnitude and cannot be used to predict future changes.

The same method was used by Fama (1962) for the thirty industrial stocks in the Dow Jones Averages (DJA.) for a four-year period (1958-1961). He found that the serial correlation coefficient for daily changes is very small and has a positive dependence, (the average serial-correlation coefficient was 0.03). However, the coefficient does not differ from zero.

Dryden (1970) conducted another test of weekly prices and found an average serial correlation co-efficient of 0.06. This value was from 15 shares. He concluded a weak-form efficiency from the sample, despite the fact that 5 shares out of the sample obtained a serial correlation for the one day lag of higher than 0.123. Brealey (1970) and Cunningham (1973) have tested the FT all share-index and weekly price series of the FT ordinary share-index (30 shares). Solnik (1973) who examined European share prices and concluded an overall random movement in share prices.

Benjamin and Girmes (1975) have also conducted a random walk test on 543 UK shares based on daily listed prices for 600 days and 200 days sub-periods. The authors found little serial correlation and thus the market for even the smaller-type company appeared to be weak-form efficient.

Generally, most of the tests for the weak-form of market efficiency led towards the proposition that price changes are random and that price histories are useless in predicting profitably price changes.

6.6.1.2 Runs Tests

A second test of the dependence of successive price changes which is used to test the weak form efficiency is the "Runs Tests". It is a statistical test that can be used to test for dependence in successive price changes, only a positive or negative indication of the price change instead of actual numerical values will be used. If price changes were dependent, then there would be "long" runs of positive or negative signs.

Runs tests have been used by many studies and the results support the random walk hypothesis. These studies indicate that successive price changes are generally independent. Cowles and Jones (1960) reported that if the number of sequences and reversals in the series of (+) and (-) signs, a sequences being either ++ or -- and a reversal being either +- or -+, if consecutive

changes are independent then the number of sequences and the number of reversals should be roughly equal.

Roberts (1959) tested the weekly changes of the Dow Jones Industrial Averages. He concluded that the history of market levels behaves very much as if these levels had been produced by the accumulation of results generated by chance models. Fama (1965) considered the daily log price changes of thirty different US. companies with samples ranging from 1200 to 1700 observed. The result shows that the actual number of runs observed was usually slightly less than the expected number but the difference would not be significant. He found that this analysis of runs shows no indication of dependence between price changes of any importance either from investment or from a statistical point of view.

6.6.1.3 Tests of Filter Rules

A third test of the weak-form efficiency is called the filter rules, the more popular "technical" trading strategies which includes applying technical trading rules to historical market data to

determine whether following a given trading rule would have produced excess returns.

The idea for this test is to show investors when they should be long in a security and when they should sell it short. The alternative to timing is to buy and hold. A filter is a device used to recognise price trends likely to persist in the future.

The hypothesis of the test is that investors cannot earn abnormal rates of returns using investment strategies based solely on historical prices.

According to Cheney and Moses (1992), filter rules are a more direct test of price-change dependency than serial correlations and runs tests.

The results show that technical trading rules do not produce abnormal returns after adjustments are made for transactions costs. So, technical trading rules do not result in returns that are any better than using buy and hold strategies. (Brigham and Gapenski, 1993)

Many tests of filter rules have analysed returns during periods of market decline. According to Fama (1966) the trading strategies based on price changes usually involve the use of filter rules. With a filter strategy, a specified percentage change in the price of a stock serves as a buy or sell signal. The underlying assumption is that once the price has changed by more than the amount of a filter, say 5%, it will move substantially further in the same direction. Filters can be of any size, and the filters for buying and selling can be different percentages. If the filters are small, the gains and losses on individual transactions will also be small, and there will be many transactions and heavy transaction costs. If the filters are large, there will be relatively few transactions, and the trader will often miss a substantial part of the potential gain when the price trends upward and will sustain large losses when the price is declining. Filter systems have been tried over various periods of time with filters ranging from 0.5%. None have worked with enough consistency to merit their use.

Alexander (1964) used filters ranging from 5% to 50% on the Dow Jones Industrial Average and the Standard and Poor-500. He found that, in general, filters of different sizes for different real

time periods yield substantial profits greater than a simple buy-and-hold policy. Mandelbrot (1968) suggested that profits from the filters were exaggerated because of the assumption that buying always occurred at a price exactly equal to the low plus $x\%$, while selling always occurred at the high minus $x\%$.

Fama and Blume (1966) suggested two methods may be profitable as alternative way for floor traders who enjoy the advantage of not having to meet transaction costs. These are :

- using a 0.5% filter, opening and closing long and short positions whenever the filter is triggered; and
- operating a 0.5% filter only on long positions when signalled by the filter.

However, it has been found that out-of-pocket transactions costs would still wipe out the excess profit over a buy-and-hold policy. They conclude that their results, for all practical purposes, support the random walk hypothesis.

6.6.2 Test of the semi- strong form of EMH

As mentioned earlier, semi-strong form tests of efficient market are concerned with whether or not current prices fully reflect all publicly available information. Many studies tried to develop trading rules on publicly available information to test if the trading rule yields an extra normal return. Publicly available information includes not only information related to data as historical prices and trading volume, but also information about individual firms or groups of firms, earnings and dividend announcements, or stock splits, financial reports of firms and industries.

The basic methodology that has been employed in the literature on semi-strong form tests was done in 1969 by Fama, Fisher, Jensen and Roll (FFJR). They analysed the NYSE's reaction to stock splits on security prices. This called a scrip issue which means increasing the number of shares without raising new capital so that a one-for-one scrip issue would double each investor's number of shares without changing the percentage ownership of any shareholder or the assets or earning of the company. The FFJR study was one of the first studies to have examine the semi-strong

form and developed a research methodology for testing market efficiency which has been widely used by other researchers.

FFJR estimated an expected return and the particular model they used was:

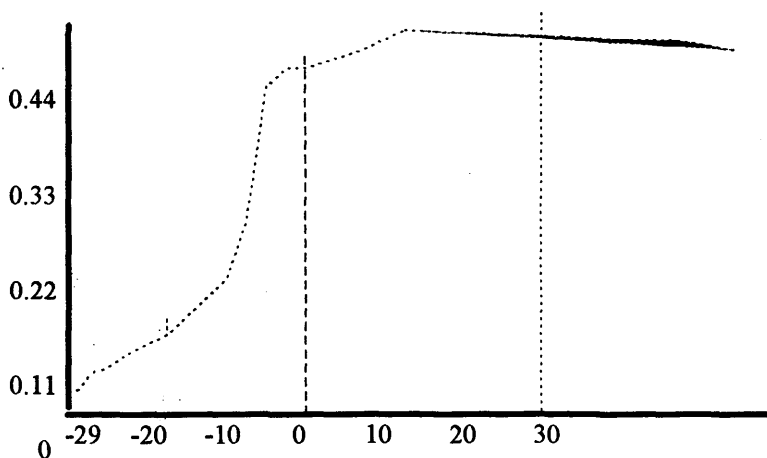
$$r_{it} = a_i + b_i r_{mt} + e_{it} \quad (6.1)$$

Where r_{it} is the return i th, r_{mt} is the return on a market index in the period t , where a_i, b_i are regression constants, and e_{it} is a random error. They used all the data available from 1926 to 1960, with the exception of 15 months before the split and 15 months after the split for those stocks that had stock splits. They then calculated the difference between the actual return and the expected return obtained by mentioned Equation

They examined the excess return for each month. i.e. the difference between actual return and expected return, and they cumulated the excess return for each month starting 30 months before the split. This can be interpreted as total excess return from 30 months prior to the split to the month under consideration.

Figure (6.2) shows that cumulative average residuals rise before the split. Month 0 is the month of the split -10 is 10 months before the split, +5 is 5 months after the split and so forth. The cumulative excess return increases dramatically before the split. In fact, the excess return is positive in every single month; which is unlikely that positive excess returns 30 months before a split are due to anticipation of a split. After the split, the stocks on average perform just as expected. The average excess return is just about zero.

Figure 6.2 Cumulative average abnormal returns.



FFJR conclude their results by arguing that stock splits are more likely to occur during abnormally good periods when the companies have performed well relative to the market during a 'boom' in general market prices.

Accordingly, a significant market reaction was observed up to the month of the split announcements, after that there was no significant market reaction. This means that the market is efficient in its semi-strong form. (Fuller & Farrell, 1987; Griffiths, 1990; Elton & Gruber, 1995)

Other studies were supported by Aharony and Swary (1980) Brown, Harlow and Tinic (1988), who also examined the "announcement effect" of variables on the return of the securities which supported the efficient market hypothesis as well.

6.6.3 Test of the strong-form of EMH

The hypothesis of the strong-form of the EMH would suggest that all information (public and private) is reflected in stock prices. The aim of the strong-form test is to discover if there is any information not reflected in the stock prices.

The activities of two groups of people are regarded as vital elements in the strong-form test: stock market specialists and corporate insiders (Niederhoffer, 1966; Scholes, 1969). In addition, the mutual funds and trust funds are most frequently examined for strong form test because of the ready availability of

data. Also, the investors who earn more than a normal percentage of the outstanding shares are considered to be trading on trade or privileged information. (Elton and Gruber, 1995)

Although non-public information is more often examined by looking at the profitability of insider trading, the difficulty is identifying it and distinguishing between legal and illegal insider trading. Thus, the limitation in the studies of strong form efficiency because the only availability of data on traders with monopolistic information which are insiders must list their purchases and sales with the S.E.C. that direct test can be made to know if the insiders with monopolistic access to inside information or not.

Jaffe (1974) collected data on insider trading from the SEC Official Summary of Security Transactions and Holdings, and examined the cumulative average residuals from portfolios from the 1950s and 1960s. Also, Niederhoffer and Osborne (1966) supported Jaffe's results suggest that insiders do earn abnormal profits and that the strong form hypothesis of market efficiency does not hold.

6.7 Stock Markets in Less Developed Countries

In most LDCs prior to World War II, capital markets were of limited significance. In the colonies of the UK, France, Italy, Germany and the US, the ability of government to incur local debt was severely limited by the absence of central banks and the maintenance by currency boards of 100 per cent foreign exchange cover. Most LDCs corporate enterprises were either foreign owned, with capital obtained from abroad, or family owned.

When the developing countries set out to modernise their economies in the 1950s and 1960s, their financial systems comprised mainly foreign-owned commercial banks which provided short-term commercial and trade credit. Governments of these developing countries decided to remodel their financial systems to ensure that resources were allocated in accordance with their own development strategies.

Thus, they either created new financial institutions to provide funding at low interest rates to the sectors that were to be at the forefront of industrial development, or they directed existing institutions to do so.

Although in recent years there have been numerous analytical and descriptive studies on share price behaviour of stock markets in developing countries, due to the availability of the data required for such studies there has been a noticeable scarcity of studies concerning the trading activities of stock markets in developing countries. (Ba-owadan, 1994)

Primarily because of a lack of reliable data, researchers have not as extensively studied stock market efficiency in LDCs as they have in the US and European countries. The results of existing studies show that stock markets in LDCs are less efficient than US and major European markets, but as efficient as small European stock markets.

Countries with stable economies and fairly well-developed and competitive financial markets would benefit from giving market forces more influence over interest rates. Where these conditions are not satisfied, governments may choose to control interest rates but, unless that control is flexible enough to take account of inflation and market pressures, it will hinder financial development.

Many developing countries have benefited from the creation of money and capital markets. Capital markets can be a source of long-term finance, both debt and equity, and can help to foster sounder corporate capital structures.

Several developing countries have made great steps in recent years in establishing and stimulating equity markets. Such markets now exist in more than forty countries. But in many countries equity markets remain small and only a few countries have active corporate bond markets.

The main reason for the underdeveloped state of capital markets in many developing countries is the absence of an appropriate legal, regulatory and tax framework.

A common problem in securities markets, especially in their early development, is the danger of a speculative boom followed by a sharp decline. While such crises have affected markets in both developing and high-income countries, they can be much more pronounced in young markets.

In the last decade stock markets in the developing countries experienced a remarkable growth in size and sophistication.

However, the stock market plays an essential role in the process as a source of equity finance, as well as a pricing mechanism for new issues.

The recent significance of stock markets for developing economies can be seen by looking at the decade of the 1980s, when the total capitalisation of the 20 largest markets increased up to seven times and the number of listed companies doubled. (Bawadan 1994)

A number of researchers attributed the relative inefficiency of capital markets in LDCs to market imperfections such as transaction costs, lack of timely information, costs of acquiring new information and possible greater uncertainty about the future. Most of the studies of LDCs stock markets have concentrated on the weak-form of market efficiency, since a market which fails to function at even this level of efficiency will also be inefficient at the more stringent levels of semi-strong and strong-form of market efficiency. (Lee 1989)

In this section we will review some empirical studies concerning the stock markets of Kuwait, Jordan, Indonesia, Malaysia and Singapore respectively.

Using the daily closing prices for a five-year period, Al-Mudhaf (1983) tested the applicability of the random walk hypothesis with forty Kuwaiti stocks. He applied the weak-form of efficiency hypothesis, according to the data which he was able to obtain from the market during the period of study. He found the market to be inefficient, despite the possibility of achieving the weak-form of efficiency. He concluded that more publicly available information and an improvement of trading conditions were required for the market to become efficient.

Laurance (1981) investigated whether the Kuala Lumpur and Singapore stock markets conformed to the random-walk hypothesis. To increase the validity of his study, he used daily closing prices of forty individual stocks over approximately 1500 consecutive trading days. He also employed auto-correlation tests and runs tests to determine whether stock prices display any systematic patterns or trend. Surprisingly, weak-form efficiency levels of the KLSE and SES rank second and third, respectively,

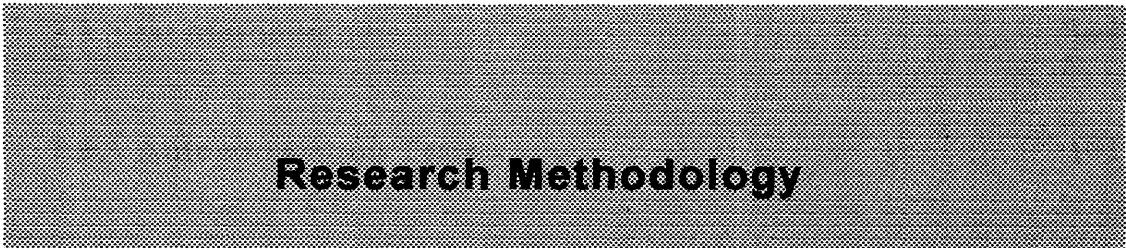
among seven stock exchanges, including those of the UK, Germany, Sweden and Norway. From his analysis, he doubted that comparisons of stock market size and efficiency reveal any association.

Errunza and Losq (1985) selected 191 stocks from ten well-established and newly-emerging securities markets of LDCs (Argentina, Brazil, Chile, Greece, India, Jordan, Korea, Mexico, Thailand and Zimbabwe) and compared the behaviour of their stock prices. The time period covered in most cases was from December 1975 to April 1981 and only monthly data was used in the tests. The average correlations of ten LDCs markets are not significantly different from zero (ranging from -0.023 to 0.108).

Koo (1982) tested the weak-form market efficiency hypothesis on the Singapore Stock Exchange. He used monthly data for the sector indices covering the period from January 1973 to December 1980. A sample of 20 companies was also investigated in the context of the random walk hypothesis, Runs test, serial coefficient and spectral analysis were applied in his study. His results support the claim to weak-form efficiency.

In general, although they are not as efficient as major Economically Developed Countries (EDC) markets, the stock markets in LDCs show a weak-form market efficiency that is quite comparable to the smaller European markets. However, the results might be quite different if more representative samples are used for LDCs markets.

Chapter Seven



Research Methodology

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7.1 Introduction

The purpose of this chapter is to review the Random walk model (RWM) which will be used as a main model, and the statistical methods which will be employed in this study to test the weak-form efficient market hypothesis which are autocorrelation tests, runs tests and filter rule. This will include a statement of the null and alternative hypotheses. finally the data will be discussed in detail.

7.2 The Random Walk Model

The RWM is a process often used to describe the behaviour of stock prices . In this study it will be used to test the weak-form market efficiency of the Saudi stock market . An appropriate model for analysing financial time series should provide an accurate description of how successive prices are determined (Taylor, 1986) .

The concept of the random walk hypothesis is that price changes are in some way random and consequently prices wander in an entirely unpredictable way. Thus, forecasts based on today's

prices cannot be improved by also using the information in previous price.

A number of definitions have been published, and there are many ways to phrase the random walk hypothesis in statistical terms and the statement that the price of a security "fully reflects" available information implied that successive price changes are independent and identically distributed. Therefore, the best forecast of tomorrow's price requires today's price but not previous prices (Fama, 1965, Taylor, 1986), and that the underlying density function f is constant over time .

Based on these assumptions, the model is generally described as follows:

$$f(p_{j,t+1}|\Phi_t) = f(p_{j,t}) \quad (7-1)$$

Where: $p_{j,t+1}$ = the price of security j one period from now,

$p_{j,t}$ = the current price of security j ,

Φ_t = the current set of information.

Simply stated, equation (7-1) says that no difference exists between the distribution of prices conditional on a given

information structure (historical prices and price patterns) and the unconditional distribution of prices. Tests of the RWM generally focus on the pattern of price changes over time as opposed to the underlying distribution of price changes.

As a result we may consider equation (7-2):

$$p_{j,t+1} = p_{j,t} + e_{t+1} \quad (7-2)$$

where: $E(e_{t+1}) = 0$

The error term e_{t+1} , may be regarded as the difference between the current price and the price one period later.

In order for equation (7-2) to be testable, however, the underlying distribution of stock price changes must be independent and identically distributed or normal .

In fact most of the empirical evidence on the RWM suggests that the distribution of stock price changes (the e_{t+1}) is not stationary over time. Specifically, security prices tend to increase with time. As a result, the mean and variance of the change in price e_{t+1} also increase within time (Fama, 1965). With this result,

traditional parametric statistical methods (such as autocorrelation analysis) will result in unreliable tests of the model. In order to avoid this problem, most times series research has focused on the difference in the logarithms of successive stock price changes, rather than on the simple difference in prices. Rewriting equation (7-2) results is in:

$$e_{t+1} = p_{j,t+1} - p_{j,t} \quad (7-3)$$

It can be seen that the difference in prices, e_{t+1} depends on the price unit. As a result, direct statistical comparisons between price series are difficult. Because consecutive prices are highly correlated and the variances of prices will increase over time. In other words, they are not stationary. Furthermore, if the mean and variance of the distribution change over time, realistic estimation of these parameters will not be possible. Because of these problems, the actual tests will not be performed on the price changes themselves but on the first differences of their natural logarithms (Fama, 1965 and Solnik, 1973) . The log price difference $x_{j,t+1}$, represents a rate of return with continuous

compounding and is the variable of interest in this study. $x_{j, t+1}$ may be computed as follows:

$$x_{j,t+1} = \ln p_{j,t+1} - \ln p_{j,t} \quad (7-4)$$

where $x_{j,t+1}$ represents the compound rate of return on security j between period t and period $t+1$.

While the variance of $(P_{j,t+1} - P_{j,t})$ increases overtime as a result of inflation and other factors, the variance of $x_{j, t+1}$ does not. If the rate of return, $x_{j,t+1}$, is shown to be normally distributed with a mean of zero (an equal probability of a gain or loss), the security is said to follow a random walk.

An alternative method of calculating return might be written as follows:

$$x'_{j,t+1} = (p_{j,t+1} - p_{j,t}) / p_{j,t} \quad (7-5)$$

In equation (7-5) $x'_{j,t+1}$ represents a one period rate of return while $x_{j,t+1}$ in equation (7-4) represents the rate of return with continuous compounding. Some researchers have studied the former while others have preferred the latter. Those who have studied both have found that the important conclusions are the

same regardless of which method of computing return is chosen (Taylor, 1986) . This study however , will focus on the compound rate of return.

In empirical research several variations of the RWM have been used. One version assumes that returns are normally distributed. Fama (1965) showed that changes in either the variance or conditional variance could explain a rejection of the independence hypothesis. This means that the hypothesis that serial returns are not autocorrelated cannot be accurately tested if the underlying distribution of returns is not stationary.

A more general hypothesis, which is the one used in this study, can be defined by replacing the assumption of identical distributions with identical means, and the assumption of independent distributions with uncorrelated distributions. The result is the following null and alternative hypothesis:

$$H_0: E(X_{j,t}) = E(X_{j,t+1}) \text{ and } \text{Cov} (X_{j,t}, X_{j,t+1}) = 0$$

For all t and $t > 0$.

$$H_1: E(X_{j,t}) \neq E(X_{j,t+1}) \text{ and } \text{Cov} (X_{j,t}, X_{j,t+1}) \neq 0$$

In words, the null hypothesis states that the serial correlation between successive returns is equal to zero. This will be tested against the alternative hypothesis that the serial correlation between successive returns is not equal to zero on a practical level, a failure to reject the null hypothesis would suggest that past prices cannot be used to predict future prices. Only the most recent price and the assumption of identical means are necessary to derive optimal forecasts. Identical means are included to ensure that the expected value of a sample autocorrelation coefficient is almost zero when returns are not autocorrelated. Finally, this form of RWM does not require the distribution of $X_{j,t}$ to be stationary.

If the null hypothesis that the serial correlation between successive returns is equal to zero cannot be rejected, then returns follow a random walk and the market for the stock or stock index being evaluated is said to be weak form efficient. It is important to note however, that rejection of the null hypothesis is not sufficient to reject the weak-form EMH. Transaction costs and taxes can prevent the exploitation of statistical dependence in returns. Thus, a market may still strictly follow a random walk.

7.3 Test Methodology

The statistical tests will be used in this study to test the weak-form efficiency, are :

1- The Serial Correlation Coefficient Test;

2-The Runs Tests;

3-Filter Rules Test.

7.3.1 Autocorrelation Tests

It is evident from the review of the literature in Chapter six that the autocorrelation test has been the most frequently used method to test weak-form market efficiency.

The correlation between two observations, X_t and X_{t+1} , obtained from a stationary distribution is called an autocorrelation with lag t , and will be represented by r_t . Thus r may be defined as follows:

$$r_t = \frac{\text{cov}(x_t, x_{t+1})}{\text{var}(x_t + y_t)} \quad (7-6)$$

Valuable information about the price formation process may be obtained from the pattern of the signs (positive or negative) of the

sample autocorrelations. For example, a preponderance of positive first-order autocorrelations may result from a slow adjustment to new information, insider information, averaged data, or infrequent trading.

Alternatively, negative autocorrelations may result from thin markets with wide fluctuations in prices around the intrinsic value and measurement errors. This happens as a result of adjustment for capital transactions that create reversals in return series (Lee, 1989).

Two different approaches will be used to test the significance of r_t . One method tests the r_t values one at a time to develop a standard error formula to determine whether a particular r_t differs significantly from zero. The standard error of the autocorrelation coefficient for a large number of observations may be defined as follows:

$$\text{S.E. of } r_t = 1/\sqrt{N-t}$$

The null hypothesis is rejected at the five percent significance level if $\text{S.E. of } r_t > 1.96$.

An alternative method of analysing the autocorrelations tests the entire set of r_t at a specifically different from a zero set . Given a set of autocorrelations, this method is designed to determine if the sequence contains "white noise" (i.e. is not autocorrelated). The Box and Peirce Q statistic will be used to determine whether this is the case:

The Q is defined as follows:

$$Q = n \sum_{t=1}^m r_t^2$$

where $n = N-d$,

N = the original number of observations,

d = the degree of differencing,

m = the maximum lag considered,

r_t = the autocorrelation coefficient for lag t

Q is approximately chi-square distributed (χ^2) with $m-p-q$ degrees of freedom. If the observed series is white noise, i.e. the observations in the series are independent and random with an

expected value of zero, the value of Q will be small and the observed set will compare favourably with the null set. This would lead to a failure to reject the null hypothesis that consecutive returns are not auto-correlated .

7.3.2 The Runs Tests

The "Runs Tests", is a statistical test that can be used to test for dependence in successive price changes. As it is a non-parametric technique which requires no assumption about a population distribution only that the underlying process is continuous. A run is defined as a succession of identical symbols which are followed or preceded by different symbol or no symbols at all. For example, -, -, +, +, 0, 0, -, would constitute four runs and for share prices it can be observe by either a rise (+) , a fall(-), or no change (0) from one period to the next. The way to analyse the randomness of a series is to compare the actual and expected number of runs in total .

If we assume that the sample proportion of the respective price changes are good estimates of the population and further assume independence between price changes, then it is possible to

compute the expected number of runs falling into each of the categories and it is also possible to compute the variance or standard error of these expected numbers. Thus it will become relatively clear to accept or reject the hypothesis of whether a series of price changes is purely random by comparing the computed number of runs with the actual number of runs. As Taylor (1986) explained the formula that, let x_t^* be 1, 0, or -1, for positive, zero, or negative x_t respectively. Also let h_t be 0 if $x_t^* = x_{t+1}^*$ and let it be 1 otherwise. Then $h_t = 1$ signifies that x_{t+1} begins a new run and so that total number of runs of all types is

$$H = 1 + \sum_{t=1}^{n-1} h_t \quad (\text{Taylor 1986}).$$

As Wallis and Robert (1956) formulate the total expected number of runs (R_E) of all signs for a price series can be obtained from:

$$R_E = \frac{[N(N+1) - \sum_{i=1}^3 \frac{n_i^2}{i}]}{N}$$

Where:

R_E is the expected number runs,

N is the total number of price changes,

n_i is the number of price changes of each sign

$i=1$ for positive changes,

$i =2$ for negative changes,

$i =3$ for no changes

If N is large, the sampling distribution of R_E is approximately normal (Wallis and Robert, 1956).

The standard deviation will be as follows:

$$\sigma = \frac{\sum_{i=1}^3 n_i^2 [\sum_{i=1}^3 n_i^2 + N(N+1) - N \sum_{i=1}^3 n_i^3 - N^3]^{1/2}}{N^2(N-1)}$$

Fama (1965) pointed that the runs test is superior to the serial correlation test as a test of independence . In as much as the asymptotic properties of the sampling distribution of R_E does not

depend on the assumption of finite variance for the distribution of price changes , the serial correlation test does .

7.3.3 Filter Rule Test

The most popular trading rule in academic research is the filter rule. This rule assumes there are trends in prices. The intention is to buy when it is believed an up-ward trend has already begun and then to sell as soon as there is sufficient evidence that a downward trend has commenced.

The hypothesis of the test is that investors can not earn abnormal rates of returns using investment strategies based solely on historical prices. According to many studies, that filter rules produce risk-adjusted returns greater than returns from a buy-and-hold strategy, would be evidence against the random walk hypothesis . For example, an $x\%$ filter is defined as follows: if the daily closing price of a particular security moves up by $x\%$, buy and hold the security until its price moves down by $x\%$ from a subsequent high. When this happens sell and go short simultaneously. The short position is maintained until the daily closing price rises at least $x\%$ above a subsequent low , at which

time the short position is covered in addition to entering a long position. Moves of less than $x\%$ are ignored. It is believed that for values of x , if the market has moved up by $x\%$ it is likely to move up more than $x\%$ further before it moves down by $x\%$.

The rate-of-return is calculated (Dryden, 1970b) as following:

$$(1 + R)^N = \prod_{i=1}^{i=t} (1 + r_i)^{n_i}$$

where n_i is the length of the i th transaction

$N = \sum_{i=1}^{i=t} n_i$, i.e. N = the total number of days represented by all

transactions,

7.4 The Data

The stock markets in developing and less developed countries are still below the level of standard condition which prevent the researcher studying these markets satisfactory. The most common problem in this field that many studies of emerging markets have had to contend with significant data problems.

According to (Yacout, 1981; Parkinson, 1984; Dickinson and Muragu 1994, and Emerson et al. 1996) that they summarised the data problems in these markets as following :

1- The non-availability of computerised databases has had a significantly limiting effect on market studies;

2- To stop trading if prices of the securities move too far, which effects the distribution of returns;

3-The trading out of the official markets which means that the transactions statement of the stock market inaccurate;

4-The thinness of the trading or non trading at all and the moving suddenly to a new price as a trade occurs

7.4.1 The data source

The data source used in this study are the prices published by Saudi Arabian Monetary Agency (SAMA).

SAMA produces a share price list of all companies in two regular forms, a daily and a weekly one . However the daily price list is preferable for the efficiency test to the weekly price list, as the majority of researchers use the daily price. But in the Saudi case it seems that the daily price list is not recommended to be used in the test of the weak form efficiency for the following reasons :

- Because there are two channels for share trading in Saudi Stock market which are either through the commercial banks or through direct contact between the buyer and the seller before the company concerned, the daily price list mostly relies on the first channel as joint stock companies very often delay in reporting direct transactions to SAMA. Such imperfections are likely to be reduced when using the weekly price list .

- It was found that some daily prices were missing from their original share source . These omissions have no significance when using the weekly price.

- Through examining the daily prices for one week with the weekly price of that same week for several randomly selected periods it was found that the average price was the same for many companies , indeed in some cases more than 30% of the total companies of which shares were traded during the week. The rest showed only a slight difference . It is more likely that there is no significant difference between the daily price and the weekly price. This is obviously so when there is infrequent share trading during the days of the week in question.

Accordingly, the weekly price is determined for the weak form test. Such a test has been done previously by Moore in 1962 when he examined the weekly price movements of 29 shares for an eight year period. Another one was done by Cunningham in 1973 for examining the FT ordinary share index on a weekly basis.

7.4.2 Data selection

The price to be used in the weekly base is the average price for the week . In Saudi Arabia, each week consists of six working days from Saturday to Thursday as business is closed on Friday.

The total shares tradable companies in the SSM are 89 until December 1996. Twenty companies have been established after 1990 and twenty six after 1994

Twenty eight companies were selected from the total above, which were the most active and were continuously trading during the test period.

The weekly price lists cover the period from 1st January 1992 to end of December 1995 which consists of 198 observations.

The most frequently traded stocks were chosen (28 companies) rather than less frequently traded stocks to avoid problems characteristic of thin markets and discontinuity in trading. In reviewing the share trade activity during the test period some companies show infrequent trading . In fact most Electricity companies show no trade at all and the other small Electricity

companies record share trading for two to fifteen weeks only during the period .

Companies were selected for the test based on the criterion that any company which had a zero trade week of sixty eight weeks or more was considered an inactive company in terms of share trade and thus was eliminated from the sample. The figure-sixty eight weeks represents 30% of the total observation for the period of the test. Table (7.1) includes the companies tested in this study.

TABLE (7.1) THE LIST OF THE COMPANIES WERE TESTED IN THIS STUDY.

Company		Company	
1	Investment Bank	15	Yamama Cement
2	Saudi French Bank	16	Saudi Cement
3	Saudi British Bank	17	Qassem Cement
4	Arab Nat. Bank	18	Southern Cement
5	Saudi American Bank	19	Yanbu Cement
6	SABIC	20	Eastern Cement
7	SAFCO	21	Hotels
8	SARCO	22	Tihama
9	Ceramic	23	Aseer
10	SAFOLA	24	SCECO Central
11	NIC	25	SCECO Western
12	Gypsum	26	SCECO Eastern
13	Food Products	27	SCECO Southern
14	Arab Cement	28	Tabuk Elec. Co.

Chapter eight

Result and analysis of the Weak-form Test in SSM

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8.1 Introduction:

The purpose of this chapter is to report the results of the weak-form market efficiency tests carried for Saudi Stock Market (SSM). This chapter will be divided into five parts. In the next section, the probability distribution of log price changes will be reported and analysed in preparation for analysing the results of the statistical tests on the weak-form market efficiency. The next three parts in this chapter will report the results of the autocorrelation tests , runs tests and the filter rules tests to establish the degree of weak-form market efficiency. In addition, the results of all tests are then compared to those of other researchers to decide the degree of weak-form market efficiency among the various world stock markets.

As mentioned before in Chapter six, market efficiency could be tested at three levels , each of which relates to a specific set of information starting from share prices to relatively more comprehensive information. These three levels are : weak efficiency, semi-strong efficiency and strong efficiency. A market is said to be an efficient in the weak form if price movements in

effect is totally independent of previous price movements. As a result investors are unable to predict future prices by using the previous price information . In the semi-strong form investors are unable to predict future prices by using both previous price information as well as publicly available information including earnings, dividends , etc. In the strong-form investors are unable to use all publicly and privately available information in predicting the future prices.

As it is very often the case with stock market in developing countries , it is not possible to examine the Saudi Stock Market in the Semi-strong form nor in the strong form of market efficiency. This is because of the absence of market makers and unsophisticated institutional investors in the Saudi Market . In other markets they tend to lead the market response to any profit or dividend information released to the market either through company annual report or through any other method .

According to Felemban(1989) for big individual investors in Saudi Arabia they often have access to company information before the annual report is distributed which obviously means that any response to such information would affect the share price

before the annual report is officially available . Thus there is likely to be no market reaction at all to the annual report when it is officially released. In addition to this non-price information is not available in a convenient form to conduct a test of semi-strong form. Information privately available is unlikely to be acknowledged in any public form .

Thus the only possible way to examine the efficiency of Saudi Stock Market is through implementing the Weak form test by using a regular share price list.

The methodology employed to perform the tests include the serial correlation test , the run test, and the filter rules test. which have been described in chapter seven. If the stock market is efficient in the weak-form , the returns should behave randomly according to the definition of weak-form which asserts that the changes in share prices are independent and the investors in the market cannot use past prices to get abnormal profits.

The weak form test of market efficiency would lead to answer two major questions: First, whether or not the price movement for today or for the present week is totally independent from

yesterday's or the previous week's movement. Second, whether investors are unable to obtain abnormal profit from studying the price movement in the past. When the answer to both questions is "Yes" then investors cannot use the past price movement in predicting the future price, which means that the market is efficient in a weak form, and on the other hand if markets are weak-form inefficient then historical data could be used to determine profitable trading systems; and the investors can use the past price movement in predicting the future prices, that means the market is inefficient in a weak form.

The equation normally used in the weak form test as follows:

$$r_t = \frac{p_t + d_t - p_{t-1}}{p_{t-1}} \quad (8-1)$$

Where :

r_t = the return during interval t.

p_t = the share price at the end of period t.

p_{t-1} = the share price at the end of the previous period.

d_t = dividends paid during the interval.

Because of a lack of reliable data the dividend information is not used in the test, it is assumed that d_t is equal to zero. Thus the

same equation will be altered to
$$r_t = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (8-2)$$

The result of the equation represents the return which in this case equals to the change in share price from one week to another as the price used in the test is the average weekly price .

8.2 The Distributional Analysis of the Data

(Empirical Distributions)

In this section we will report the empirical distribution of all stocks listed on the Saudi market to determine whether the distribution is normal.

The purpose of the tests is to provide preliminary evidence regarding the form of the distributions on the SSM .

The data set is comprised of 5544 observations(198x28) on weekly average prices from January 1992 to December 1995 on the top 28 traded Saudi equities.

The tests of the normality of the distribution of price changes are provided in view of some conflicting evidence on this issue in developed countries

For each price series, a simple logarithmic transform was carried out and the mean and standard deviations computed from the normal method, which gives maximum likelihood estimators. Having computed the mean we then compute the second third and

fourth moments about the mean from which are deduced the Standard deviation, skewness and kurtosis values for each Stock .

The following table (8.1) and graphs (8.1, 2, 3, 4) below summarise the empirical distribution findings for the Saudi data.

From table (8.1) we can notice that most shares have very small averages . This is due to the thin trading on the market . That means shares are not traded every week and it is difficult for investors to liquidate their investment in shares easily. Also, the changes in prices do not occur frequently. Because of the small amount in changes in shares prices or infrequent trading these lead to small values of standard deviations as shown in table (8.1) which means that the chance of a large price fall is relatively low.

TABLE (8.1) THE EMPIRICAL DISTRIBUTION RESULTS

Company	mean	ST.D	skewness	kurtosis
Investment Bank	0.001719	0.049251	0.6327	7.8484
French Bank	-0.00073	0.040138	0.5193	6.8384
British Bank	-0.00073	0.03633	0.4341	7.0452
Arab Nat. Bank	-0.00133	0.039969	-0.0974	8.0822
American Bank	-0.0006	0.036021	0.8778	6.8292
SABIC	-0.00048	0.076164	0.3728	61.7794
SAFCO	0.001221	0.029781	1.3291	10.7962
SARCO	-0.0015	0.062039	-0.6209	15.953
Ceramic	-0.0042	0.039616	-4.6973	59.9648
SAFOLA	0.003692	0.12361	12.0852	161.6581
NIC	-0.00376	0.242248	-0.1821	94.9929
Gypsum	0.002999	0.106374	8.9036	121.6913
Food Products	-0.00137	0.040092	0.3109	6.1156
Arab Cement	-0.00399	0.072321	-9.5959	122.3658
Yamama Cement	0.002068	0.056756	6.6201	68.4123
Saudi Cement	-0.00501	0.057522	-9.5168	116.9593
Qassem Cement	-0.00153	0.03625	-2.7522	20.7652
Southern Cement	0.00301	0.053232	3.3374	35.9391
Yanbou Cement	-0.00153	0.037905	-0.994	18.4977
Eastern Cement	0.002511	0.050056	8.8932	111.8714
Hotels	0.003813	0.042312	0.7865	9.3177
Tihama	0.002792	0.0489	-0.6011	11.5121
Aseer	0.00186	0.07841	-3.5054	42.5496
SCECO Central	-0.0014	0.016347	-0.1445	6.2536
SCECO Western	-0.00036	0.023264	6.0323	65.2879
SCECO Eastern	-0.00117	0.026282	-0.984	14.6126
SCECO Southern	-0.00144	0.235461	0.0149	94.7951
Tabuk Elec. Co.	0.001253	0.01921	1.0947	45.5491
Average	-0.00015	0.063424	0.662607	48.36726

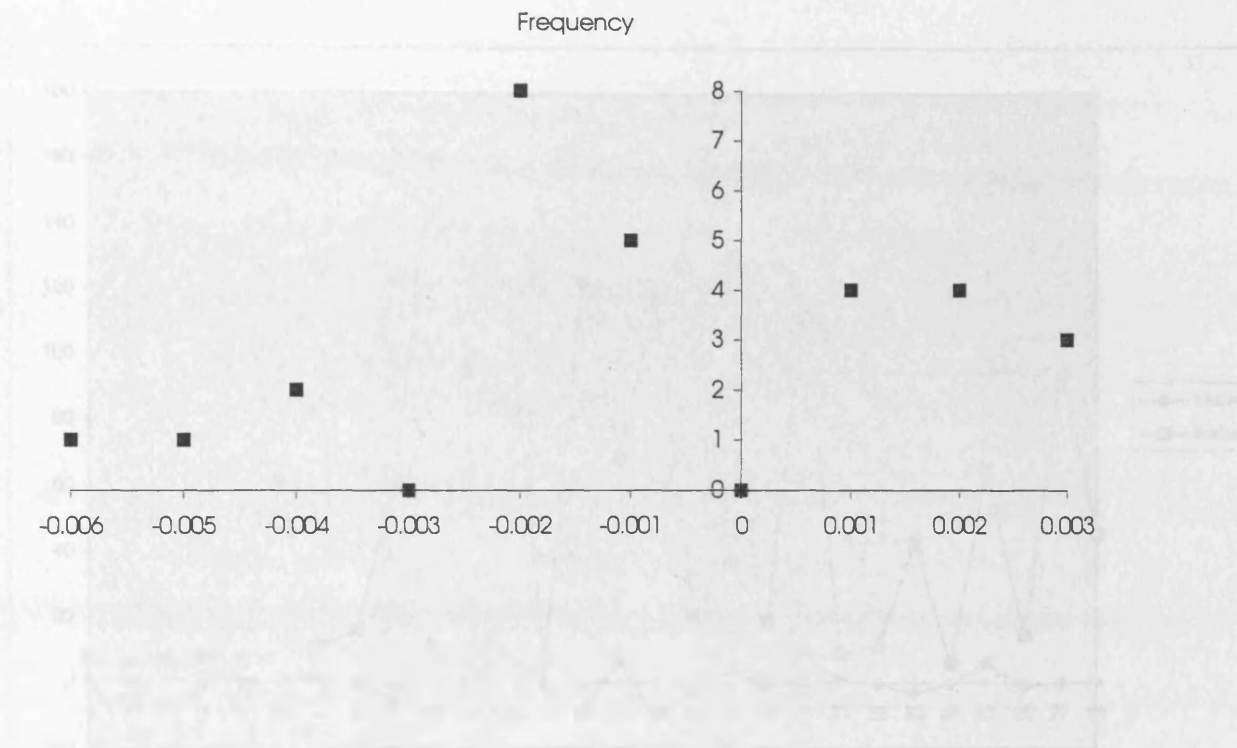
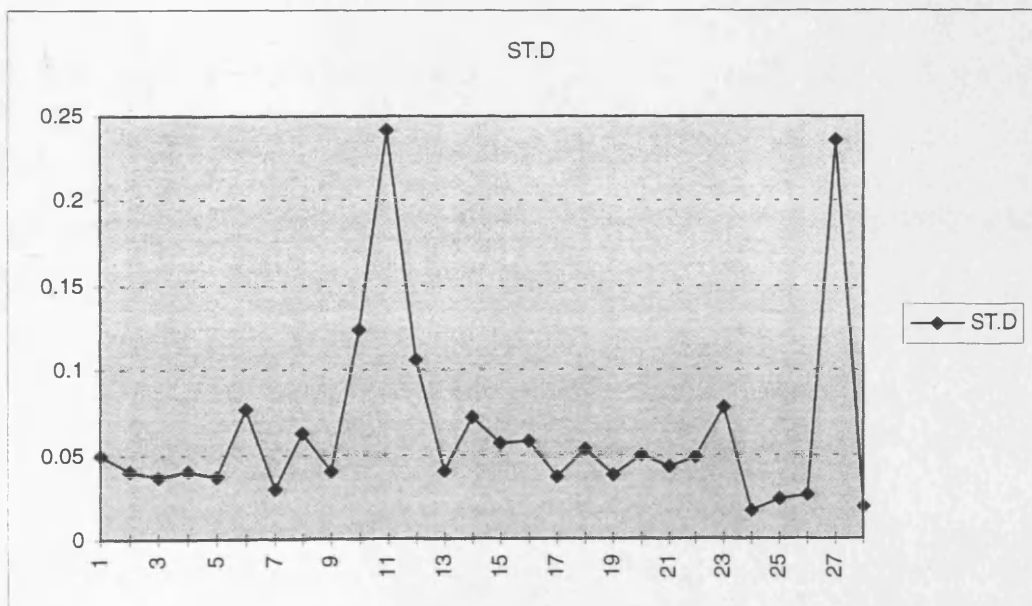
Figure 8.1 Frequents distribution of means**Figure- 8.2** Frequents distribution of Standard deviations

Figure-8.3 Kurtosis and Skewness of log returns.

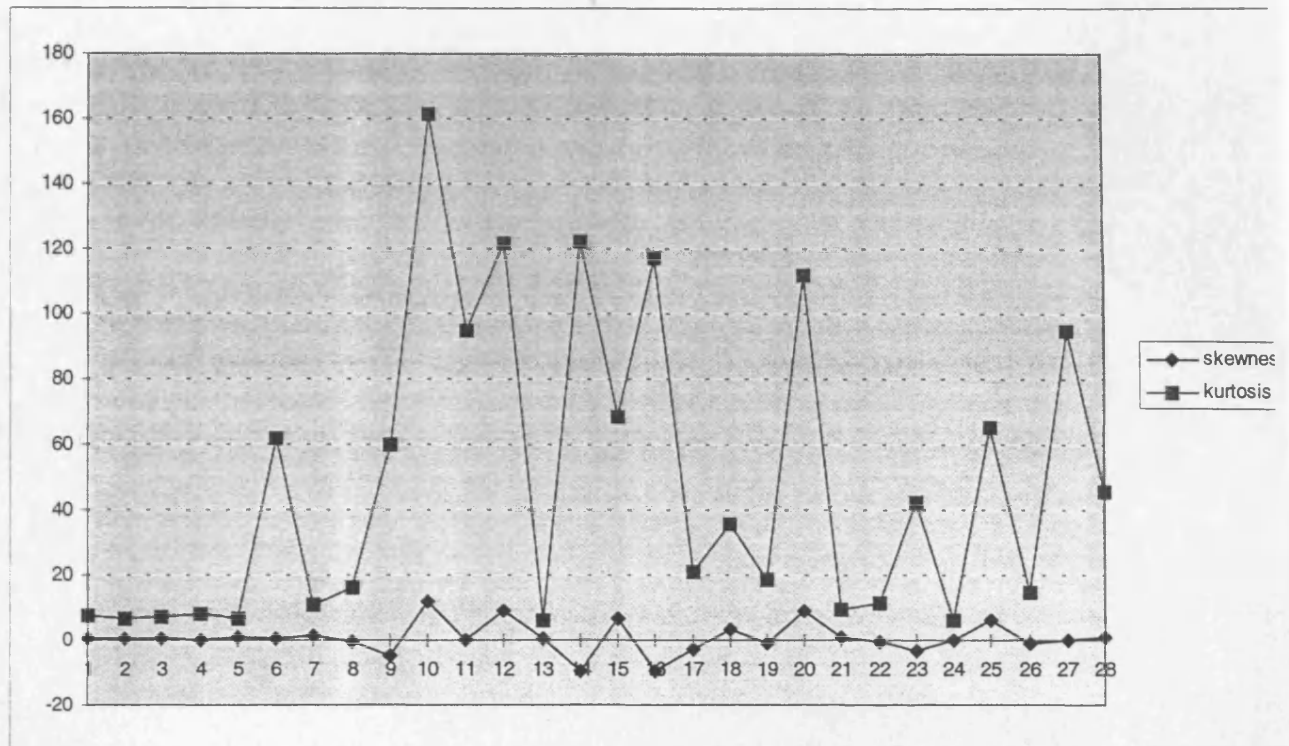
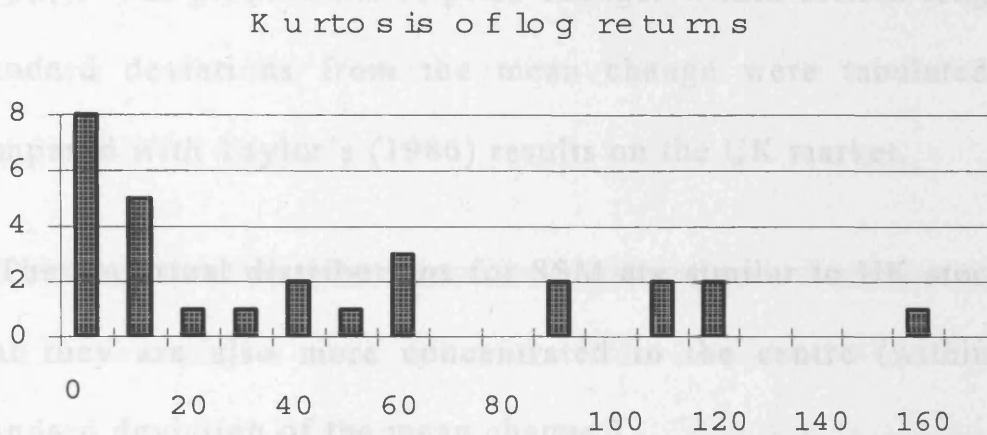


Figure- 8.4 Kurtosis of log returns



As can be seen from figure(1) clearly in the period of the study there are more shares(18 out of 28) which have shown a decline than have advanced.

Frequency distribution of the differences of natural logarithms of individual weekly stock prices were constructed i.e. $\ln(p_t) - \ln(p_{t-1})$. The proportions of price changes within certain ranges of standard deviations from the mean change were tabulated and compared with Taylor's (1986) results on the UK market.

The empirical distributions for SSM are similar to UK stocks in that they are also more concentrated in the centre (within one standard deviation of the mean change)

Also it is possible to compare the magnitude of the average volatility inferred from the above diagram figure (2) with the volatility given in Taylor's study for the UK market . which is clearly close to the mean of the Saudi equities, as is evident from the diagram above.

Table(8.1)and the figure (8.3) show how skewness in log return distributions varies across the companies in our sample.

It is worth mentioning that the estimated skewness parameters for the log share returns of the study is heavily peaked near zero as is consistent with the returns being log normally distributed. Furthermore the skewnesses themselves are broadly symmetric with respect to the modal value of zero.

The theoretical value for the standard error of skewness when sampling from the Normal distribution is $\sqrt{6/n}$ which is approximately 0.1 in our case.

Turning now to the empirical values for kurtosis of the distributions across companies, we see that the theoretical value of 3 for the kurtosis implied by a normal distribution is exceeded in all cases, indicating that returns are distributed with fatter tails than the normal curve would dictate .

Given that the sampling error for estimating the kurtosis of a Gaussian White Noise process can be shown to be $\sqrt{24/n}$, with a 95% confidence level. In our case the sampling error would be the order of 0.3, and 2 standard deviations above the Normal kurtosis of 3 would still be 12 standard errors below the smallest of the observed kurtosis values.

Thus in the case of each data set we have shown that many of the log returns are not distributed according to the Normal distribution . Series that are not apparently normal seem to have extreme values in the tails of the frequency distributions which can effect the values of standard deviation, skewness and kurtosis.

8.3 The independence hypothesis tests

The theory of random walks in share prices implies that successive price changes are independent and are identically distributed . of these two conditions, independence is the most important, since a test of independence amounts to a test of the so-called “weak form” of the efficient market hypothesis

In this section the independence hypothesis will be tested with autocorrelation tests, i.e. parametric tests the Box and Pierce Q statistic . Also, this hypothesis will be tested with Runs tests, i.e., non-parametric tests and in final this hypothesis will be tested with Filter rule, i.e., technique test . By using of Taylor (1986) programs in analysis of data for all the tests in this study.

The results of these tests mentioned above will provide a base for deciding whether the null hypothesis can be rejected or not and help in the determination of the degree of weak-form SSM efficiency of the validity of the null hypothesis .

The hypothesis would be rejected for the entire sample group at 95% confidence level only if 3 or more individual sample stocks turned out to be significant . The total number of rejections is a

random variable and has a normal distribution with a mean of np i.e., $n = 28$ in this study and a standard deviation of $\sqrt{np(1-p)}$

8.3.1 The Autocorrelations Test Analysis

The serial correlation coefficient measures the relationship between the value of a random variable at time t and its value in the previous period .

The hypothesis tested is that the correlation coefficients of successive weekly average price returns on the SSM, at lag $\kappa(\kappa=1, \dots, 30)$ were zero. To test the hypothesis the sample serial correlation coefficients, r_k , were computed for each company across 30 lags (Taylor, 1986; Dickinson,)

The population serial correlation (ρ_a) coefficient is estimated using the sample serial correlation coefficient (r_a). For complete serial independence $\rho_a = 0$, and complete dependence $\rho_a = \pm 1$. Using the null hypothesis that $\rho_a = 0$, a significance test may be performed on the variation of r_a from 0. Here confidence intervals of two and three standard errors are used. The standard error (σ) of serial correlation coefficients is obtained by:

$\sigma = 1/\sqrt{n-1}$ where n is the number of observations. If the distribution has a finite variance, then for large samples, the standard error of the sample serial correlation coefficient, r_k , may be computed as $\sigma(r_k) = 1/\sqrt{N-k}$

where N is the sample size.

The individual coefficients were then tested by examining whether their values were consistent with a population value of zero. The level of significance used was five percent. A two-tailed test was used, because the dependence hypothesis does not stipulate the direction of the correlation coefficient

The population correlation coefficient, ρ_k , between the return of a security over time period $(t-1, t)$ and its return $t-k$ periods earlier, is given by :
$$\rho_k = \frac{Cov(u_{t-k}, u_t)}{Variance(u_t)}$$

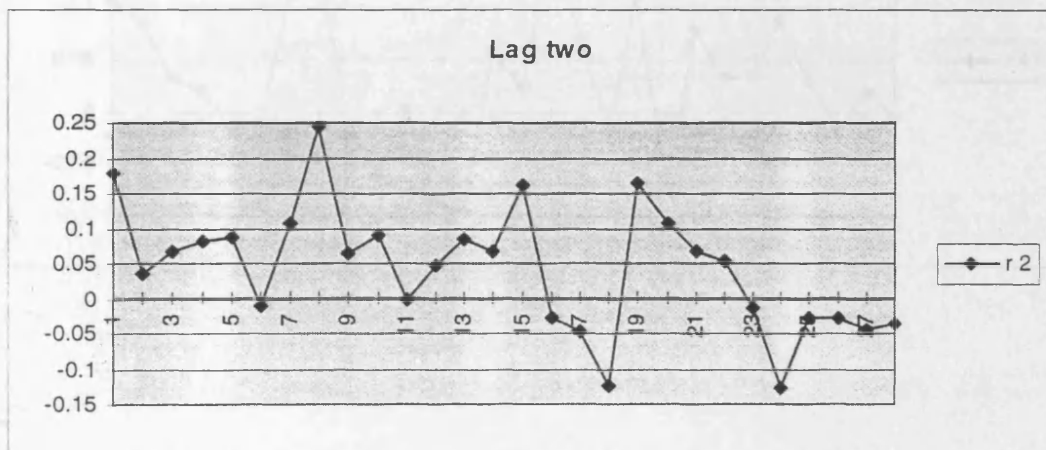
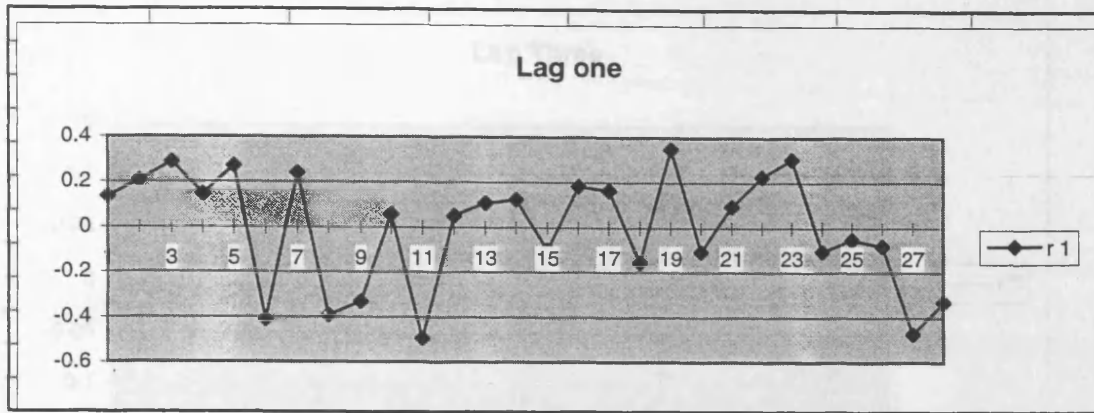
where: $Cov(u_t, u_{t-1})$ = the covariance between the return of a security over time period $(t-1, t)$ and its lagged return $t-k$ periods earlier. (Dickinson, 1992)

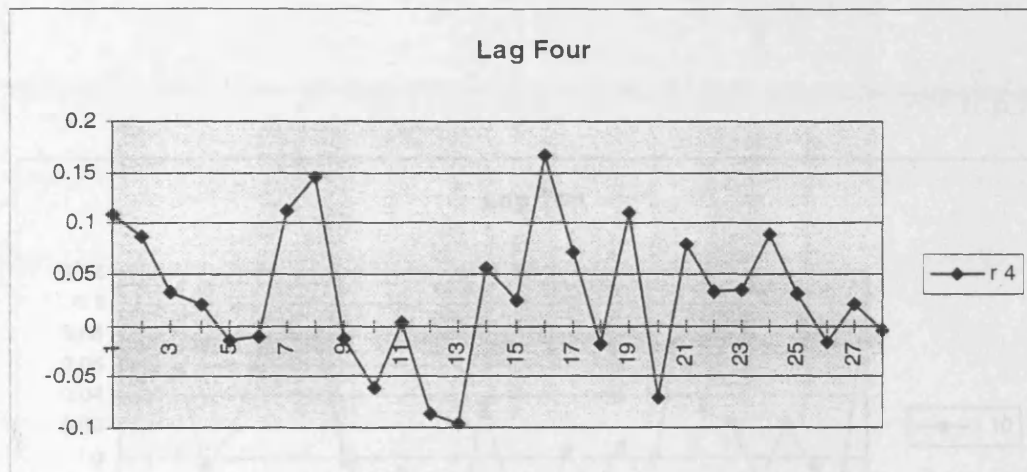
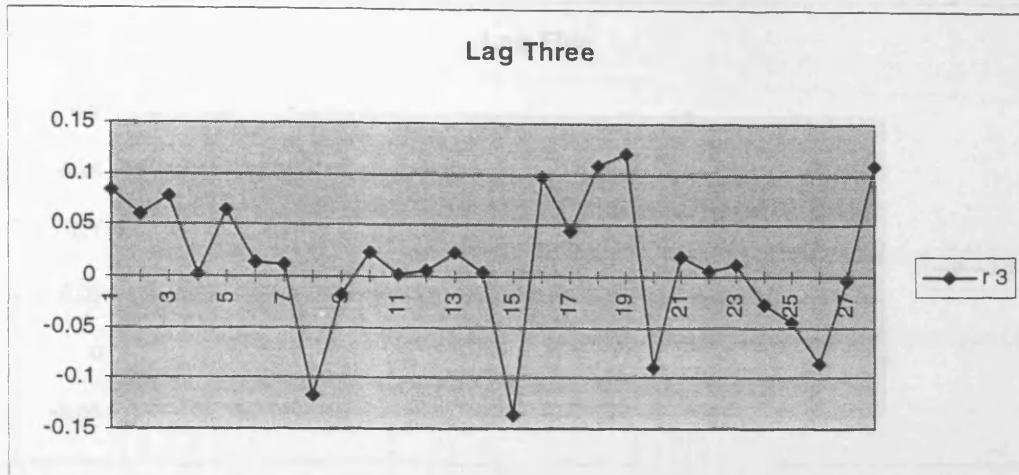
Variance (u_t) = the variance of the return of a security over time period (t-1,t).

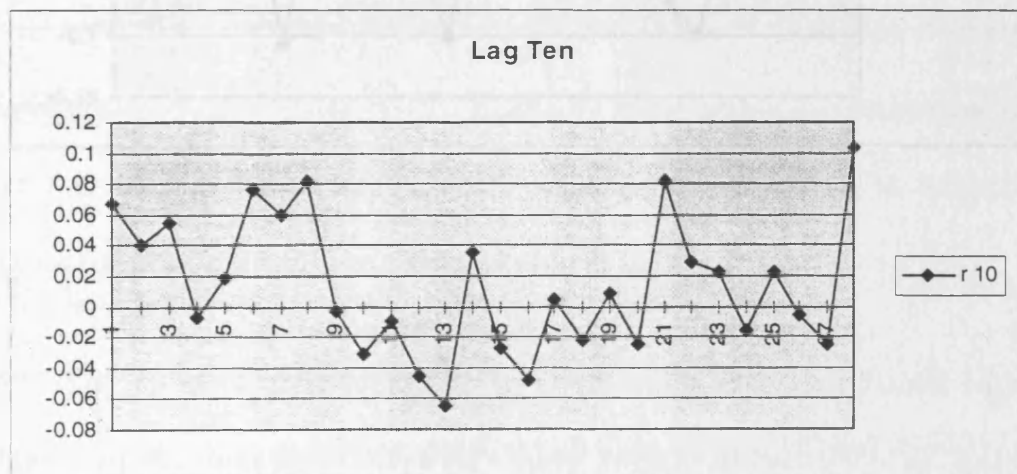
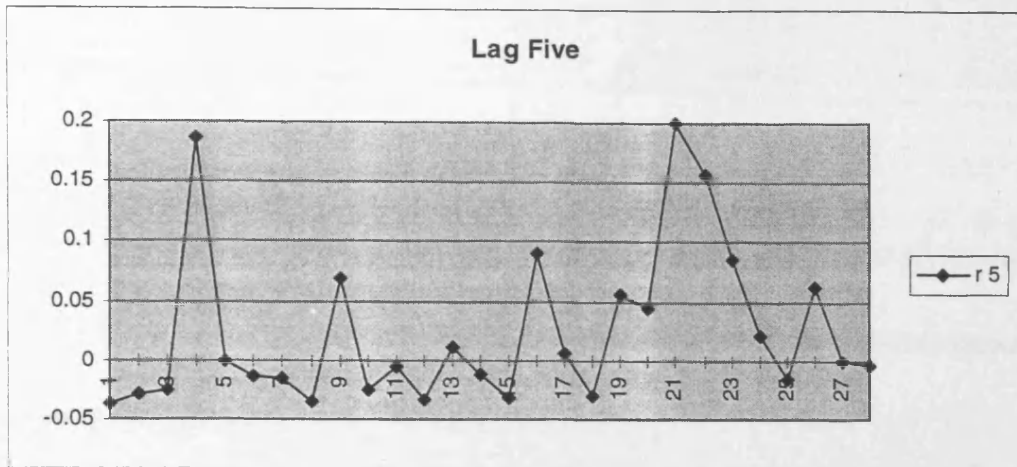
The hypothesis of the weak form efficiency should be rejected if stock prices are serially autocorrelated. Table (8.2) reported the results of the test autocorrelation coefficients for the Stocks Studied (for lag 1-5,10,30)

(8.2) THE RESULTS OF THE TEST AUTOCORRELATION COEFFICIENTS

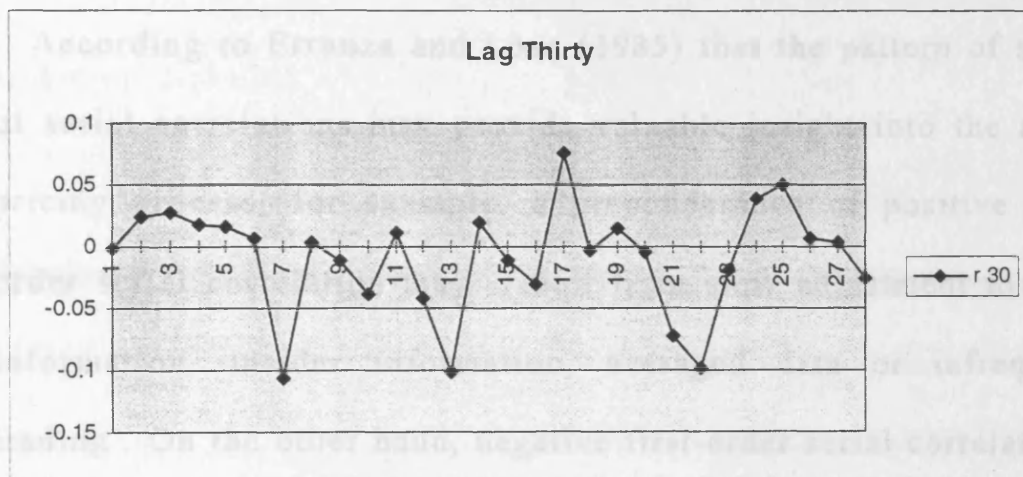
Company	r 1	r 2	r 3	r 4	r 5	r 10	r 30
Investment Bank	0.134	0.178	0.083	0.109	-0.036	0.068	-0.002
French Bank	0.204	0.037	0.061	0.087	-0.028	0.041	0.024
British Bank	0.288	0.066	0.078	0.033	-0.025	0.054	0.027
Arab Nat. Bank	0.145	0.082	0.002	0.020	0.186	-0.007	0.018
American Bank	0.270	0.087	0.065	-0.015	0.000	0.019	0.016
SABIC	-0.411	-0.009	0.013	-0.011	-0.013	0.076	0.007
SAFCO	0.239	0.107	0.011	0.113	-0.015	0.060	-0.107
SARCO	-0.390	0.244	-0.117	0.145	-0.035	0.081	0.004
Ceramic	-0.331	0.065	-0.017	-0.013	0.069	-0.003	-0.012
SAFOLA	0.056	0.090	0.023	-0.061	-0.025	-0.031	-0.038
NIC	-0.494	-0.002	0.002	0.003	-0.005	-0.010	0.012
Gypsum	0.049	0.048	0.005	-0.087	-0.033	-0.045	-0.042
Food Products	0.109	0.085	0.024	-0.097	0.011	-0.065	-0.101
Arab Cement	0.123	0.066	0.003	0.056	-0.012	0.036	0.020
Yamama Cement	-0.099	0.162	-0.136	0.025	-0.031	-0.027	-0.012
Saudi Cement	0.182	-0.027	0.098	0.166	0.090	-0.048	-0.031
Qassem Cement	0.162	-0.047	0.044	0.072	0.006	0.004	0.075
Southern Cement	-0.155	-0.124	0.110	-0.019	-0.030	-0.022	-0.004
Yanbou Cement	0.348	0.164	0.121	0.110	0.056	0.009	0.015
Eastern Cement	-0.107	0.108	-0.089	-0.070	0.044	-0.025	-0.005
Hotels	0.094	0.066	0.019	0.080	0.200	0.082	-0.073
Tihama	0.224	0.052	0.005	0.032	0.157	0.029	-0.099
Aseer	0.302	-0.013	0.011	0.035	0.086	0.022	-0.020
SCECO Central	-0.105	-0.128	-0.027	0.089	0.022	-0.016	0.038
SCECO Western	-0.054	-0.026	-0.045	0.031	-0.015	0.023	0.050
SCECO Eastern	-0.081	-0.027	-0.086	-0.016	0.062	-0.006	0.007
SCECO Southern	-0.471	-0.043	-0.004	0.020	0.000	-0.025	0.003
Tabuk Elec. Co.	-0.330	-0.037	0.110	-0.004	-0.004	0.103	-0.026
Average	-0.004	0.044	0.013	0.030	0.024	0.013	-0.009







We found that most of the companies (60%) of the first lag coefficients are rejecting H_0 at 5 per cent significance level (17 out of 28 companies where $|r_1| \geq 1.96$). Twelve of the sample were negatively autocorrelated which is often expected from this markets with wide fluctuations in returns.



may arise from thin markets errors in prices or errors in adjustment for capital transactions that create reversals in return series.

The advantage of our sign test method has been found in other studies, for example, Broot (1964) found a majority of negative signs in the serial correlation coefficients of weekly changes in log prices of stocks on the New York Stock Exchange. Pama (1965) also found that twenty-three out of the thirty stocks of the Dow Jones Industrial Average of the first order coefficients were

Result and analysis of the Weak-form test in SSM- 202

We found that most of the companies(60%) of the first lag coefficients are rejecting H_0 at 5 per cent significance level (17 out of 28 companies where $\sqrt{n} |r_1| > 1.96$) . Twelve of the sample were negatively autocorrelated which is often expected from thin markets with wide fluctuations in returns .

According to Errunza and Losq (1985) that the pattern of signs of serial correlations may provide valuable insight into the asset pricing process, for example, a preponderance of positive first order serial correlation may result from slow adjustment to new information, insider information, averaged data or infrequent trading . On the other hand, negative first-order serial correlations may arise from thin markets errors in prices or errors in adjustment for capital transactions that create reversals in return series.

The advantage of one sign over another has been found in other studies, for example Moor (1964) found a majority of negative signs in the serial correlation coefficients of weekly changes in log prices of stocks on the New York Stock Exchange. Fama(1965) also found that twenty-three out of the thirty stocks of the Dow Jones Industrial Average of the first order coefficients were

positive . Laurance (1986) who looked at the stock exchanges of Singapore and Kuala Lumpur, found that most of the shares on both markets had positive signs. (Hssan, 1989)

For other lags in this study the number of significant estimates decreases generally. In addition, we can notice the autocorrelation coefficients are large in value that means the base to profitable trading is possible .

For example, the largest value in lag one is 0.348 for Yanbu company. This means that if the price of this company rose 10% in excess of the expected return on that stock this week; it could be expected to rise at an excess of 34.8% over the expected return on the next week .

The evidence from the results suggests that there is significant autocorrelation on stock prices. The largest absolute value in lag one is (0.494) for Nic company . This means that relating past price to present price explains $(-0.494)^2$ or 24.4% of the variation in today price .

A process is said to be strict white noise if the observations which it generates , X_t are independently and identically

distributed. The sample Autocorrelations (R_t derived from the X_t series) are approximately distributed as a normal distribution with mean zero and variance $1/n$ where n is the number of observations

The table below shows a useful application of the above statistic to the set of all companies in our Saudi study, pooling all correlations obtained from all companies (over lag ranges 1 to 30).

Autocorrelation magnitude	Frequency Count
-0.9	15
-0.1	9
-0.08	4
-0.07	6
-0.06	8
-0.05	11
-0.04	14
-0.03	18
-0.02	24
-0.01	31
0	20
0.01	31
0.02	23
0.03	12
0.04	18
0.05	10
0.06	11
0.07	8
0.08	7
0.09	1
0.1	19
0.9	0

This table shows that the number of autocorrelations which lie outside the acceptance region for the Normal distribution $N(0, 1/n)$

is approximately 20% in total for a two tailed test. The lower limit, of the acceptance region given our sample size of 198 is approx. $-0.071 * 1.96$. As can be seen from the table, some 5% of the observations on returns fall below this figure and similarly some 6% of the observations fall above the upper confidence limit for a single observation of a correlation coefficient.

8.3.1.1 Box and Pierce Q Statistic

The Box and Pierce test is the appropriate joint test in this circumstance. The Q-statistic is frequently used in general time series research to test for zero autocorrelation. (Taylor 1986). The hypothesis tested as following:

H_0 : a whole set of r_t is a null set .

If this hypothesis is rejected, the series of stock price changes are independent.

The Q is defined as follows:

$$Q = n \sum_{t=1}^m r_t^2$$

where $n = N-d$

N = the original number of observation,

d = the degree of differencing,

m = the maximum lag considered, and

r_t = autocorrelation coefficient for lag t .

Q is approximately distributed as a Chi-square (χ^2) statistic with (m-p-q) the degrees of freedom . If the series is non-stationary and highly correlated, the average value will be inflated. If the observed series is a white noise, i.e. , the observation in the series are independent and random with expected value equal to zero, then the value of Q will be small, and the set of autocorrelations, taken as a whole, will be compared favourably with a null set. (Box and Pierce 1970).

The Q-statistics computed across 30 lags for each company in this study. Results will be given of two tests, using k=10, and 30 . The decision rule is that the coefficient is significant if $Q_{30} > 43.77$ and $Q_{10} > 18.31$

As in the following table (8.3) the result has been presented for the first 30 autocorrelation coefficients. The null hypothesis of independence is rejected at $Q_{10} > 18.31$ and $Q_{30} > 43.77$. We found that for Q_{10} only seven shares are rejected ,and the rest of the sample, twenty one, not rejected. But at Q_{30} the statistics do not reject the null hypothesis of serial independence for all the shares.

The Box-Pierce results are not consistent with the individual analysis of autocorrelation coefficients, where most of the shares here did not reject the null hypothesis of serial independence.

TABLE(8.3) BOX-PIERCE RESULTS

Company	q10 critical 18.31	q30 critical 43.77		Company	q10 critical 18.31	q30 critical 43.77
Investment Bank	14.44	26.15		Yamama Cement	17.21	18.78
French Bank	19.80	31.30		Saudi Cement	18.92	21.30
British Bank	24.87	35.35		Qassem Cement	20.22	29.00
Arab Nat. Bank	9.35	14.80		Southern Cement	19.03	26.30
American Bank	16.02	36.21		Yanbou Cement	25.38	31.49
SABIC	13.14	15.22		Eastern Cement	8.09	11.26
SAFCO	15.72	36.57		Hotels	4.98	14.02
SARCO	24.90	33.55		Tihama	15.13	26.27
Ceramic	6.98	24.07		Aseer	7.49	34.40
SAFOLA	5.15	7.93		SCECO Central	15.29	30.54
NIC	5.46	6.07		SCECO Western	2.84	13.45
Gypsum	1.12	2.80		SCECO Eastern	15.77	16.56
Food Products	10.68	30.54		SCECO Southern	6.15	17.07
Arab Cement	2.84	3.84		Tabuk Elec. Co.	4.53	5.08

8.3.2 *The Runs Tests Analysis*

As we mentioned in chapter six the idea of the runs test is that if a series of observations is generated by a random process, then the actual number of runs observed should equal the expected number of runs, unlike the serial correlation test, it is not affected by extreme values in the return series. Thus, the test preserves the time order of the observation to test the randomness of the series. However Runs test is a strong test to investigate serial dependence in share price movements. The test is non-parametric and is independent of the normality and constant variance of the data.

As Taylor (1986) Points out, the only non-parametric statistic used to date is the total number of runs. which defined as sequence of price changes of the same sign; positive run is a sequence of consecutive positive returns, a no-change run is a sequence of zero returns, and a negative run has a similar definition. We usefully define the following functional notation, to represent positive, negative, and neutral runs are defined :

$$F(x_t) = \left[\begin{array}{lll} + & \text{for } x_t > 0, & - \text{ for } x_t < 0 \text{ and } 0 \text{ for } x_t = 0 \end{array} \right] .$$

For example, (+, -, - ,-, +; 0,0; +, +) would constitute five runs . If the number of possible number of types of runs (3) is known, the number of observations is greater than 25, and the sample is continuous , then the expected number of runs for a random return series can be determined. In other words if successive returns are not autocorrelated , the actual number of runs will not be significantly different from the expected number of runs .

The results of the runs tests for 28 company the most active in Saudi Stock Market are presented in Table (8.4)

TABLE(8.4) THE RUNS TEST RESULTS

Company	Runs Down	Runs Up	No change	Runs Total	Expected Runs	STD expected runs	Z value
Investment Bank	71	84	42	116	127.6	6.5	-1.78
French Bank	107	76	14	91	109.6	6.5	-2.86*
British Bank	99	86	12	93	110	6.6	-2.58*
Arab Nat. Bank	96	84	17	95	113.9	6.6	-2.86*
American Bank	100	81	16	88	112.6	6.5	-3.78*
SABIC	96	78	23	101	117.6	6.5	-2.55*
SAFCO	82	90	25	96	119.6	6.5	-3.63*
SARCO	34	31	132	87	98.8	5.2	-2.27*
Ceramic	78	48	71	111	129.8	6.5	-2.89*
SAFOLA	111	58	28	108	114.4	6.1	-1.05
NIC	93	74	30	108	121.7	6.4	-2.14*
Gypsum	67	53	77	76	130.9	6.5	-8.45*
Food Products	91	69	37	114	124.8	6.4	-1.69
Arab Cement	77	72	48	130	129.9	6.5	0.015
Yamama Cement	93	64	40	95	125.2	6.4	-4.72*
Saudi Cement	88	78	31	101	122.9	6.5	-3.37*
Qassem Cement	76	90	31	99	122.7	6.5	-3.65*
Southern Cement	86	76	35	90	124.9	6.5	-5.37*
Yanbou Cement	84	81	32	103	123.7	6.5	-3.18*
Eastern Cement	87	81	29	115	122	6.5	-1.08
Hotels	61	71	65	120	132.1	6.6	-1.83
Tihama	54	63	80	117	130.6	6.5	-2.09*
Aseer	78	65	54	119	130.9	6.5	-1.83
SCECO Central	62	59	76	137	131.5	6.5	0.846
SCECO Western	77	59	61	136	131.3	6.5	0.723
SCECO Eastern	55	57	85	125	129.5	6.5	-0.69
SCECO Southern	41	49	107	98	119.2	6.1	-3.48*
Tabuk Elec. Co.	3	6	188	17	18.4	1	-1.4
						Average	-1.59

Large 0.846 Small -8.45

In the table (8.4), the results for the weekly returns are presented and we have included seven columns, as follows : in the first three columns: runs down, runs up ,and no change , the fourth column shows the run total , the expected runs in the fifth column , the sixth column shows the standard deviation of expected runs , and in the last column the standardised variable Z which has been calculated as $[R-E/\sigma]$, and the computed value is significant at the five percent level if it lies beyond its critical value of ± 1.96 .

It can be seen from the table that seventeen out of the twenty-eight shares (i.e. 64%) are significantly different from zero i.e. Z -values which are greater than the critical value of ± 1.96 , and the remaining nine shares have insignificant Z -values . The mean standardised variable for all the shares is -1.59. The absolute mean standardised variable for differencing interval one is 0.846 . The smallest standardised variable is -8.45 .

From the table it is also to be noted that of the 28 companies in the sample, 25 produced a negative Z value and only 3 produced a positive Z value. The negative Z -value indicates that fewer runs

occurred than were expected . This resulted from a large number of trading weeks on which no trade happened.

Also, from table 8.4 we can see that the expected number of runs are greater than the actual number of runs among the majority of stock (25 out of 28). This indicates that some long runs exist in the SSM in the weekly time intervals.

Finally, it appears that the runs test results were in line with the serial correlation coefficient results, we can conclude that according to the result of both tests they would indicate that SSM cannot be supposed to be an efficient market.

8.3.2.1 Further Analysis

In this section , we attempt to compare our results with those obtained from earlier research on other markets in order to find out how the Saudi stock market behaved in comparison with other stock markets using the Runs test . Table 8.6 shows the results which are obtained for some of the major markets around the world. Fama (1965) found 8 standardised variables smaller than -

2, out of the thirty stocks he examined . His absolute standardised mean variable is 1.53 . The results for the Saudi stock market show a seemlier degrees 1.59 of dependence to that implied by Fama's results.

Laurance (1986) reported on his study of the Singapore and Malaysia stock market. He indicated that there is a larger dependency in share prices in Singapore than Malaysia. He reported 17 stocks to have a significant standardised variable for the Singapore Stock Market out of twenty-four shares he examined, and the mean absolute standardised variable of runs for differencing interval one is 2.67. While for the Malaysian stock market , only six shares have shown a significant standardised variable from sixteen stocks he examined and the mean standardised variable is 1.73.

Dryden (1970) reported only negative standardised variables for differencing interval 1. His results indicate larger degrees of dependence for London stock market .

Conad (1973) show a greater departure from randomness in his study for Germany stock market , that forty-eight out of the fifty-

four stocks (i.e. 88%) have shown non-randomness with a mean absolute standardised variable of 3.8.

Also in the case of Swedish stock market has been study by Jennergen (1975) found twenty-seven out of the thirty stocks have a significant standardised variable , and the mean absolute standardised variable of runs for differencing interval one is 4.64.

TABLE 8.5 RUNS TEST COMPARISON FOR SAUDI STOCK MARKET WITH OTHER STUDIES.

Country	Reference	Sample	Z	Z>1.96	%
USA.	Fama(1965)	30	1.53	8	26%
Malaysia	Laurance (1986)	16	1.73	6	37%
Singapore	Laurance (1986)	24	2.67	17	70%
UK	Dryden (1973)	15	3.29	12	80%
Germany	Conad(1973)	54	3.8	48	88%
Sweden	Jennergen (1975)	30	4.64	27	90%
Netherlands	Dorsman(1984)	20	1.69	8	40%
Kuwait	Hassan(1989)	25	2.44	14	56%
Jordan	Hassan(1989)	58	2.3	27	46%
Saudi	Present study Table (8.5) (1997)	28	1.59	18	64%

8.3.3 The Filter Rules Test Analysis

The results of the Filter Rule Tests which we have carried out, reported in the table (8.6) are essentially the same trading rule as used by Alexander (1961) in his test of market efficiency.

According to Alexander (1961) Filter works as follows: if it is true that returns are positively serially correlated, a large return last period is a good indication of a large return this period . An $x\%$ filter rule would have the investor buy those stocks subsequent to periods when their returns exceed $x\%$. Hold these stock until their return falls by $x\%$. Most of the studies involving filter rules involve daily stock return data. As Fama and Blume(1966) explain, Alexander's filter rule is designed to 'test the belief, widely held among market professionals, that prices adjust gradually to new information'

Alexander's argument was that if a market shows a tendency for filter trades to manifest significant improvement on a simple buy and hold strategy then clearly there would appear to be arbitrage opportunities in the market and thus inefficiency. Academics have been until recently rather divided about the merits of studying

filter rules as several authors have asserted that the presence or absence of apparently profitable filter rule trading strategies deduced ex-post may not have direct relevance to the market efficiency.

However, the professional analysts operate in the belief that there exist certain trend generating facts, knowable today , that will guide a speculator to profit if only he can read them correctly. These facts are assumed to generate trends rather than instantaneous jumps because most of those trading in speculative markets have imperfect knowledge of these facts, and the future trend of price will result from a gradual spread of awareness of these facts through the market (Alexander, 1964; Frankfurter and Lamoureux, 1988)

Results for best and worst rate of return obtained following filter rule trading strategy with filter rates in the range between 0.0001 and 0.153 are shown in table (8.6).

TABLE(8.6) FILTER RULE TEST RESULTS

Company	Minimum Return	Maximum Return	buy&hold return	Best Strategy
Investment Bank	-0.0009	0.0008	0.0017	Buy and hold
French Bank	-0.0005	0.0055	-0.0007	filter
British Bank	-0.0013	-0.0012	-0.0007	Buy and hold
Arab Nat. Bank	-0.0010	-0.0009	-0.0013	Buy and hold
American Bank	0.0029	0.0033	-0.0006	filter
SABIC	-0.0008	-0.0008	-0.0005	Buy and hold
SAFCO	0.0015	0.0044	0.0012	filter
SARCO	-0.0014	-0.0011	-0.0015	filter
Ceramic	-0.0042	-0.0042	-0.0042	Buy and hold
SAFOLA	0.0038	0.0054	0.0037	filter
NIC	-0.0034	-0.0020	-0.0037	filter
Gypsum	0.0068	0.0125	0.0030	filter
Food Products	0.0009	0.0009	-0.0014	filter
Arab Cement	0.0014	0.0039	-0.0040	filter
Yamama Cement	0.0023	0.0023	0.0021	filter
Saudi Cement	-0.0042	-0.0036	-0.0050	filter
Qassem Cement	-0.0019	-0.0019	-0.0015	Buy and hold
Southern Cement	-0.0013	-0.0011	0.0030	Buy and hold
Yanbou Cement	0.0004	0.0067	-0.0015	filter
Eastern Cement	0.0048	0.0054	0.0025	filter
Hotels	-0.0041	-0.0041	0.0038	Buy and hold
Tihama	-0.0028	-0.0028	0.0028	Buy and hold
Aseer	-0.0019	-0.0019	0.0019	Buy and hold
SCECO Central	0.0002	0.0002	-0.0014	Buy and hold
SCECO Western	0.0015	0.0015	-0.0004	filter
SCECO Eastern	-0.0001	-0.0001	-0.0012	filter
SCECO Southern	-0.0015	-0.0015	-0.0014	Buy and hold
Tabuk Elec. Co.	-0.0013	-0.0013	0.0013	Buy and hold

It will be interesting at this point to recall the random walk hypothesis testing of each series. One might expect that those time series for which the random walk model was rejected in favour of the price trending model, a filter rule strategy would be more profitable than a buy and hold.

Turning to the interpretation of our results, the last column in the table summarises the situation found for the Saudi stock market. It shows that in slightly less than half the top(13 out of 28) companies, no filter rule, of whatever parameter value, could be found which was more profitable than a buy and hold strategy.

This is a strong indication that the market is efficient. However, given the short nature of the run of observations (198) and the infrequency of the data (weekly), one should caution against reading too much into this one result.

Taken in conjunction however with the other weak form efficient market tests :the runs tests and autocorrelations tests, the overall pattern which emerges is of a market that is predominantly efficient. At any rate given the limited quantity of data available in this study, it has not been found conspicuously inefficient.

8.3.3.1 Comparable Studies

In this section we will compare filter rule test results applied in other stock markets with the results from this study as listed in (table 8.7) .

Fama and Blume (1966) filter analyses of each of the thirty shares which comprise the Dow-Jones Industrial Average produced results which are roughly in agreement with what would be expected on the assumption of efficiency that prices follow a random walk. They found that the average over the thirty shares and twenty-four filters which they employ the average rate of return is 1.85 percent but the corresponding buy and hold rate of return is considerably higher. In other word this study concludes that filter rules are not profitable in comparison to a buy and hold strategy.

Dryden(1970) applied filter rules to three sets of data of UK stock market . He found that; the average rate of return from filter is lower than the average rate of return from buy and hold in most cases, also found that most filter rules are unprofitable relative to buy and hold

Jennergren (1975) applied filter rules to 30 stocks traded on the Stockholm in Swedish stock market. He concluded that the smaller filters were on average not profitable relative to buy and hold.

Alshamali (1989) in his study for Kuwait Stock Market, he found that the results cannot support market efficiency, since abnormal profits are likely by using mechanical trading rules.

In comparing results of SSM to the result above we found the result support mark efficiency i.e. the buy and hold is profitable .

TABLE 8.7 FILTER RULE COMPARISON FOR SAUDI STOCK MARKET WITH OTHER STUDIES.

Country	Reference	Sample	Result
USA.	Fama (1965)	30	Buy&Hold
UK	Dryden (1973)	15	Buy&Hold
Sweden	Jennergren (1975)	30	Buy& Hold
Kuwait	Alshamali (1989)	42	Filter
Saudi	Table (8.5) 1997	28	Buy&Hold

8.4 CONCLUSION

In the first part of this analysis which was the empirical distributions we have seen that many of the log returns are not distributed according to the Normal distribution.

The independence part of the hypothesis has been tested by means of serial correlation coefficient and runs tests, two standard test types used in several earlier random walk studies . In addition, the technique test 'Filter rule' was applied to test the efficiency of SSM. Table 8.8 summaries all the results for all three tests . In order to compare between the result that the autocorrelation tests showed (Table 8.9) that 11 data samples out of the 28 supported the null hypothesis of independence whereas the Q test gave support for 21 samples. While the Q test is itself dependent on the autocorrelation coefficients and from the above discussion these have suspect validity, this large difference might not be too unexpected. In same way to compare between Runs test with the autocorrelation and Q test results showed that of the 28 companies in the study only 10 support the null hypothesis of independence in the Runs test. Since this test is non-parametric the

extreme values will not affect the outcome as the non-normality factor can be disregarded. Comparison shows that 9 data sets out of the 28 support all three tests on independence at the same time and in another hand comparison shows that 7 data sets out of 28 not support an any of the three tests on independence at the same time. The table(8.9) below shows the details. A(*) indicates that the null hypothesis of independence is supported and (-) indicates that the null hypothesis of independence is not supported

TABLE (8.8) SUMMARY

The Test	Autocorrelation test	Q Test	Runs test	All indep.	All Not indep.	Filter Rule	
						Buy and hold	Filter
Total Independent supporting H_0	11	21	10	9	7	13	15

TABLE (8.9) COMPARISON OF THE RESULTS.

Companies	Autocorrelation test	Q Test	AU+Q	Runs test	Results summary	Best Strategy	
Investment Bank	*	*	xx	*	all indep.	Buy and hold	
French Bank	-	-	aa	-	not-indep.		filter
British Bank	-	-	aa	-	not-indep.	Buy and hold	
Arab Nat. Bank	-	*		-		Buy and hold	
American Bank	-	*		-			filter
SABIC	-	*		-		Buy and hold	
SAFCO	-	*		-			filter
SARCO	-	-	aa	-	not-indep.		filter
Ceramic	-	*		-		Buy and hold	
SAFOLA	*	*	xx	*	all indep.		filter
NIC	-	*		-			filter
Gypsum	*	*	xx	-			filter
Food Products	*	*	xx	*	all indep.		filter
Arab Cement	*	*	xx	*	all indep.		filter
Yamama Cement	*	*	xx	-			filter
Saudi Cement	-	-	aa	-	not-indep.		filter
Qassem Cement	-	-	aa	-	not-indep.	Buy and hold	
Southern Cement	-	-	aa	-	not-indep.	Buy and hold	
Yanbou Cement	-	-	aa	-	not-indep.		filter
Eastern Cement	*	*	xx	*	all indep.		filter
Hotels	*	*	xx	*	all indep.	Buy and hold	
Tihama	-	*		-		Buy and hold	
Aseer	-	*		*		Buy and hold	
SCECO Central	*	*	xx	*	all indep.	Buy and hold	
SCECO Western	*	*	xx	*	all indep.		filter
SCECO Eastern	*	*	xx	*	all indep.		filter
SCECO Southern	-	*		-		Buy and hold	
Tabuk Elec. Co.	-	*		-		Buy and hold	
Total Independent supporting H_0	11	21		10	16	13	15

TABLE 8.10 COMPARISON BETWEEN RUNS TEST AND FILTER RULE

Companies	Runs test	Result	Best Strategy	
Investment Bank	*	all indep.	Buy and hold	
French Bank	-	not-indep.		filter
British Bank	-	not-indep.	Buy and hold	
Arab Nat. Bank	-		Buy and hold	
American Bank	-			filter
SABIC	-		Buy and hold	
SAFCO	-			filter
SARCO	-	not-indep.		filter
Ceramic	-		Buy and hold	
SAFOLA	*	all indep.		filter
NIC	-			filter
Gypsum	-			filter
Food Products	*	all indep.		filter
Arab Cement	*	all indep.		filter
Yamama Cement	-			filter
Saudi Cement	-	not-indep.		filter
Qassem Cement	-	not-indep.	Buy and hold	
Southern Cement	-	not-indep.	Buy and hold	
Yanbou Cement	-	not-indep.		filter
Eastern Cement	*	all indep.		filter

Hotels	*	all indep.	Buy and hold	
Tihama	-		Buy and hold	
Aseer	*		Buy and hold	
SCECO Central	*	all indep.	Buy and hold	
SCECO Western	*	all indep.		filter
SCECO Eastern	*	all indep.		filter
SCECO Southern	-		Buy and hold	
Tabuk Elec. Co.	-		Buy and hold	
Total	10	16	13	15

Chapter nine

Summary and Conclusions

9.1 Summary

The Saudi Arabian Stock market has been developed in the same way as other markets around the world, and the evolution of the SSM is very similar to other stock markets.

But in a small market it is unlikely that all kinds of public information will be freely available. Furthermore, some studies show a low level of efficiency in small markets. Different types of efficiency have been explained, depending on what set of information is said to be fully reflected in the price. One indication of a completely efficient market is when no abnormal returns can be made from the information because the current price reflects all the available information.

This study has examined the efficiency of the Saudi Stock Market by applying the weak-form test of the efficient market hypothesis, since the only information available is the prices of past years. To test for weak-form efficiency of SSM, the prices over a four years period 1992-1995 have been analysed statistically.

It is worth mentioning that tests using the semi-strong form of the hypothesis are extremely rare for stock markets in developing countries, perhaps because of the absence of data in an accessible

form and also due to several other factors, which have been described in Chapter Six.

Our empirical examination included tests for empirical distribution of log price changes, auto-correlation tests, runs test, and filter rules.

The purpose of testing the empirical distribution of log price changes was to determine whether the stock price changes are normally distributed. To test the significance of normality of the stock price changes, a simple method of constructing an empirical distribution table was used.

The statistical techniques used for investigating the behaviour of SSM stock prices, as a means of measuring and analysing the SSM's degree of efficiency, included auto-correlation tests, runs tests and the filter rule. To determine the degree of significance of the results of auto-correlation tests, the Box and Pierce Q statistic was applied.

Before testing the basic hypothesis, that the SSM is weak-form efficient, the distribution of stock price changes was examined, because the normal distribution appears to be a good description of the majority of the share prices change series studied. From the

empirical results of this study, the following conclusions can be summarised:

Firstly, the results of the distributions of log price changes were obtained with the simple method of constructing empirical distribution tables and substantial deviations from normal distributions were found in the weekly time intervals. These had more observations around the mean and the fat tails.

Secondly, the results of statistical techniques tests were:

1- from the result of the auto-correlation test we found that, in most of the companies (60%), the first lag coefficients are, statistically, significantly different from zero, (i.e. 40% independent). Twelve of the samples were negatively auto-correlated, which is often expected from thin markets with wide fluctuations in returns. For other lags the number of significant estimates decreases generally. The evidence from the results suggests that there is a significant auto-correlation on stock prices. In other words, the SSM is an inefficient market by this test.

2- The results of the Box and Peirce Q statistic indicate that from the entire set of auto-correlations for lag 10 and 30 there periods were support for 21 samples being independent.

3-From the results of the runs tests we notice that eighteen out of the twenty-eight shares in the sample were significantly different from zero. Therefore the runs test proves that the SSM is inefficient (36% independent).

4- Finally, the result of the filter rule test shows that, in slightly less than half of the companies in the sample, no filter rule, of whatever parameter value, could be found which was more profitable than a buy and hold strategy. however, connecting with the other weak-form efficient market tests, the auto-correlations tests, and the runs tests the overall pattern which emerges is of a market that is predominantly efficient. At any rate, given the limited quantity of data available in this study, it has not been found to be conspicuously inefficient.

However, this weak-form evidence indicates that the Saudi stock market has a lower level of efficiency than other large markets. As Solnik (1973) indicated, small markets tend to have lower levels of efficiency than large, well-traded markets. He suggests the reason

for the lower levels of efficiency to the discontinuity in trading. Tennergren and Krosvold (1974) also tested the hypothesis that the larger the market the greater the efficiency. They found that smaller markets were less efficient.

9.2 Conclusions and Recommendations

The economic interpretation of the results is that the statistical analysis does suggest strongly that the market was not being informationally efficient during the period of study (1992-1995). The main reasons behind this result can be summarised as follows. Firstly, SSM, being similar to others in developing countries, is not as technically organised as developed capital markets, which causes the distribution of information of stock prices to be only between the financial community. Secondly, as we have mentioned earlier in Chapter Seven, the trading volume in the SSM is very low only 15% from the total issued shares, and much more unstable than one would find in the well-developed capital markets. Accordingly, it may

take considerable more time to adjust fully to the information than would otherwise be expected in the well-developed capital markets (Dokery and Kavussanos, 1996). Consequently, most investors are unable to predict the same results on information received and that will reflect on their dissuasion to sell or buy their shares.

As some researchers suggest (Samuels, 1976; Dokery, 1996), there are three factors that would lead to a prior classification of an inefficient market. These are newly established markets, small size and lack of sufficient regulation and information disclosure.

Accordingly, in the case of the SSM, some of the factors mentioned above are likely to affect the market, such as:

- The SSM is a new established market that, the active trading has been only less than 20 years.
- the small size of the stock market with only 89 traded Saudi companies and with share dealings almost limited to Saudi companies and Saudi citizens.
- The market capacity is unsuitable to provide services capable of meeting the needs of the expanding private sector;

- the absence of the co-operation between the commercial banks and the financial market is due to the lack of suitable investment channels and diversified savings instruments; (The Sixth Development Plan 1995)

- the practical disclosure of information is still unsatisfactory.

However, as we have discussed early in Chapters Two and Five the capital market grew substantially in the Fifth Plan period (1990-1995) in terms of volume and value of shares traded. Still, some constraints are impeding the capital market's effectiveness in mobilising and directing savings towards investment channels, and have reduced the market's ability to absorb and trade government equity shares in some of the public sector enterprises proposed for privatisation.

The main target of the Sixth Plan strategy is develop the private sector, through the capital market which will be developed through many policies.

Accordingly, to improve the stock market ability and to make it more active and efficient, some issues need to be dealt with in order to improve the performance of SSM, including the following:

1- Improvement of the efficiency of the stock market should be accompanied by the liberalisation of the financial sector. In other words, to develop the stock market it is important that the government continues to followed careful macroeconomics policies. Market efficiency could be improved also through the establishment of independent sources for the collection, analysis and dissemination of data about the performance of individual joint-stock companies;

2- Most of the domestic investors could not analyse the information about the stock market and the performance of Joint companies, so the amount of shares in trading are very low about 15% from the total shares; also the majority of the investment money is in estate property or as banking deposit.

3- The Universities and research Centres have to carry their responsibility for the SSM through the establishment of conferences and working-groups to connect the academic researcher with practical businessmen to meet their problems and find the suitable solutions. Furthermore , short courses and training for investors should be established by the Economics and Finance Departments, which will be helpful and useful;

4- Recently, SAMA the allows foreigners to deal in the capital market under specific rules, by established new "Investment Fund" by American bank; this new step should be no longer to analyse the performance and take the right decision to allow others banks to establish same business.

5-The privatisation of the government-owned companies should be accelerated, and companies wishing to go public in order to increase the supply of shares available for investment should be encouraged;

6- To increase investors' confidence in the market, the sources of information and their quality regarding Saudi joint-stock companies should be improved and made available to the public. A number of specific points can be undertaken to further increase the investors confidence, such as: an improvement in accounting and reporting standards; simplifications of information; and an improvement in the law to ensure that private contracts are avoided.

7- To allow the brokers to take their positions in the market as market-makers and increase investors' confidence in them, regulations could be enforced to license these brokers and to ensure that they carry out their activities under control.

8- The regulations of shares trading needs to be developed and improved regularly to simplify the procedures of buying and selling; and to avoid the barriers in market activities such as insider trading and the concentration of holdings.

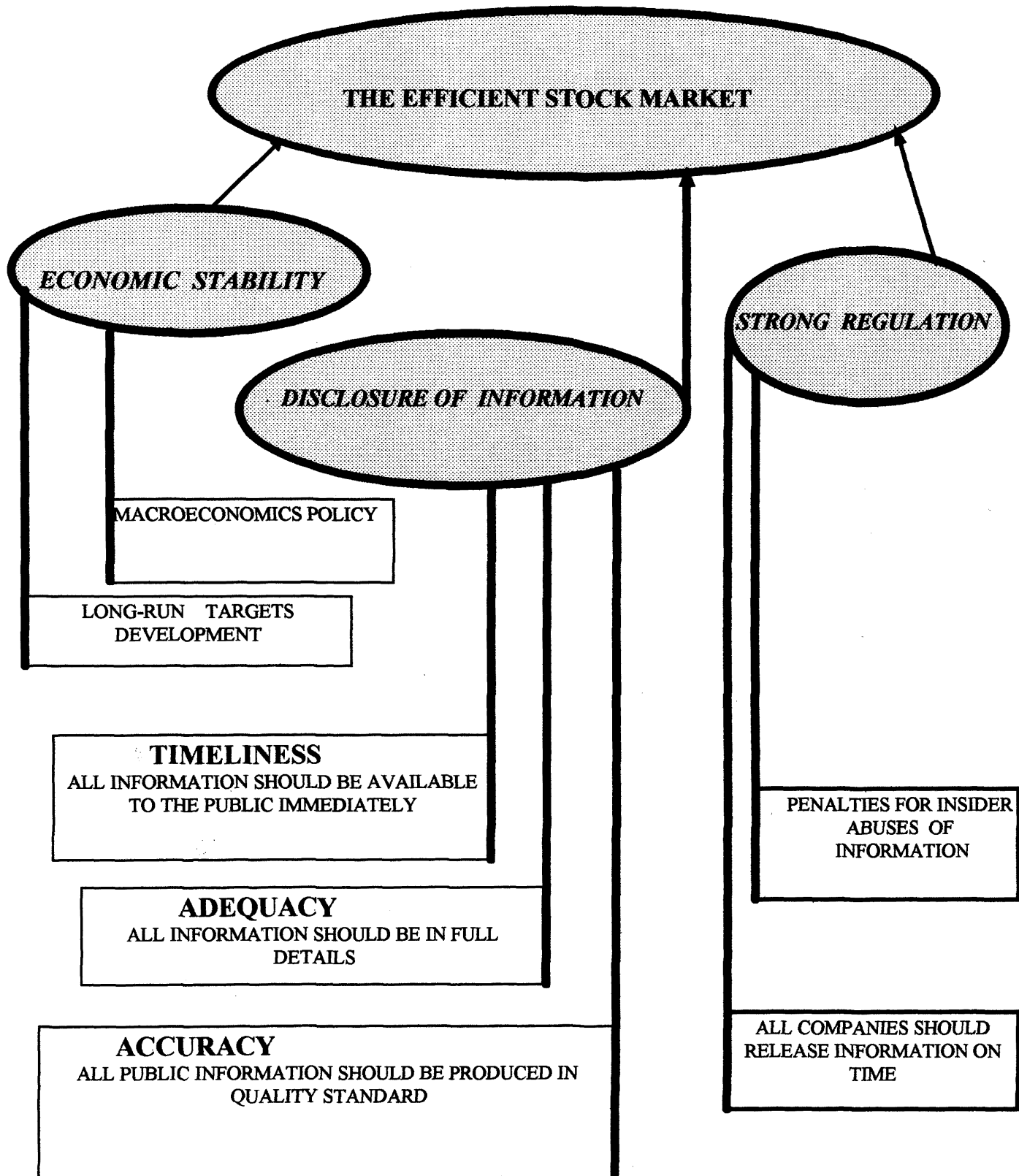
9- Co-operation among the countries of the Gulf Co-operation Council should be increased to bring the stock markets of the GCC countries towards a greater unity, by allowing the GCC citizens to buy shares of companies registered in any one of the countries in the Council. However, the regulatory environment is very important, which means that without effective regulation and its enforcement, the market will loose the confidence of the international investors.

10- Finally, three factors are necessary for an efficient stock market, these are: stability economics; disclosure information and strong regulation, as shown in figure (9.1).

9.3 Future studies recommended

As seen from this study, SSM is a new market and is within the developing market classification. Thus, there are many subjects and activities which it still needs to explore and evaluate, for example:

- The investment funds in the banks are a newly established practice but indications are that they are to become the market-makers according to the amount of their capital;
- Also, the semi-strong form test of this market should be conducted when the data is available;
- And the importance of privatisation and its impact on the international market, at least within the Gulf States needs to be explored and evaluated;
- Lastly there is a need to study all the stock markets in Gulf states in total and evaluate the unification of those markets.

Figure 9.1 the three factors essential for an efficient stock market

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