Long-Run Performance of Greek Initial Public Offerings (IPOs)

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January 2012

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ABSTRACT

The aim of the research report is to analyze and discuss the long-run performance of Greek IPOs during the period 1995 – 2007, which is the most active period in the modern history of the Greek Stock (Athens) Exchange, comprising one bull and one bear equity market. The analysis is performed both on the aggregate period and on three sub-periods and the outcome is also discussed in conjunction with empirical evidence from the international market based on relevant literature. The report presents the pros and cons of IPOs in general and the regulatory framework of IPOs in Greece, and finally examines factors, which may influence the long-run performance of IPOs.

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Chapter 1
Introduction

1.1 Aim of the Research Report - Dissertation

The aim of the research report – dissertation is to analyze and discuss the long-run performance of Greek IPOs during the period 1995 – 2007, which is the most active period in the modern history of the Greek Stock (Athens) Exchange, comprising one bull and one bear equity market.

1.2 Structure of the Research Report

The report is divided into 7 chapters. Chapter 1 presents the aim and structure of the dissertation.

Chapter 2 discusses the pros and cons of a company going public. It explains the importance of this decision, the benefits arising from an IPO for a company (such as capital proceeds, transparency, daily valuation and liquidity), as well as the drawbacks from such a step (for example gradual loss of management control, issuing and listing costs and greater focus on short-term performance).

Chapter 3 presents the regulatory framework of IPOs in Greece with an emphasis on the prerequisites and the procedure of a company going public.

Chapter 4 reviews academic dissertations and studies of the Greek as well as the international IPO literature where the under pricing phenomenon of IPOS is observed and tested. The literature review indicates that there is a positive performance in IPOs during the initial trading days, a fact that does not necessarily hold for the long run.

Chapter 5 constitutes the core section of the research report as it analyses and discusses the long run performance of Greek IPOs during the period 1995 – 2007. The analysis is performed both on the aggregate period and on three sub-periods and the outcome is also discussed in conjunction with empirical evidence from the international market based on relevant literature.

Chapter 6 examines factors, which may influence the long-run performance of IPOs (such as firm size, age and elections' year) and finally Chapter 7 presents the report's conclusions in synopsis.

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Chapter 2
Initial Public Offerings (IPOS) – Pros and Cons

2.1 Listing on the Stock Exchange

The listing of a company's shares on the Stock Exchange constitutes an important step in the life of an enterprise. The importance is basically attributed to the fact that the enterprise has the ability to access yet another source of financing[1], which the large majority of enterprises do not have. This means that the enterprise can raise a significant level of capital that can be used to support critical investment plans and therefore to provide a significant competitive advantage and important driver for the company's future growth.

2.2 The Pros and Cons of Going Public

Reasons in Favour of Going Public

The listing of a company's shares on the Stock Exchange certainly means the enlargement of the company's owners due to the dispersion criterion. The regulation of the Athens Exchange stipulates that the company should have sufficient dispersion of its shares to the public. An increase of the number of shareholders means that the control of the initial shares (shares prior to the listing) is limited. The question therefore that arises is the following: What are the reasons that lead a company to go public? Answers to the above question can be offered as follows:

- The enterprise may require additional capital in order to capture new important investment opportunities.
- Some of the initial (founding) investors of the company, such as venture capital companies, may want the enterprise to buy their stocks so they can invest this capital in more efficient activities.
- The company may also wish to use the shares as part of a remuneration program for its employees. The listing of stocks renders this easier as their value is determined freely in the stock market.
- The listing of a company's stocks via a public offering does not include all or even the majority of the company's shares.

[1] Avanidhar Subrahmanyam and Sheridan Titman, 1999, "The Going-Public Decision and the Development of Financial Markets", The Journal of Finance, Vol. 54, No. 3., pp. 1045-1082

- Going public does not require collateral or guarantees, as required to receive a loan[2].
- Going public is accompanied with an increase of the share capital and in this way the credit ability of the company is also increased. Consequently, due to the reliability that characterizes listed companies, the latter may succeed better terms of bank lending.
- Beyond the direct raising of capital, going public gives the company access to investors for future needs in capital at any time (i.e. share capital increases).
- It provides the company with prestige and reliability towards its customers, suppliers, but also the public authorities because of the use of specialized knowledge of the advisers and underwriters. In this manner, the company gets one step ahead its competitors.
- It decreases taxes for the company and in case of transfer of listed shares shareholders are exempt from paying tax on capital gains. This may vary from country to country.
- It attracts many other companies to enter into agreements, strategic alliances or even mergers or acquisitions.
- It constitutes a way of daily valuation for the company through the stock market.
- It facilitates the attraction of new dynamic executives in the company.
- Both the company and its products become more popular to a broader audience.
- Comparative advantage against competitors is achieved (access to sources of capital, projection and publicity).
- Investors control and put “pressure” on the company’s management for better performance.
- The company is monitored by financial analysts (control of forecasts, identification of weaknesses, comments).
- The financing options for investment plans are extended (reduction of dependence on bank debt, more aggressive investment policy).
- The structure of the balance-sheet becomes healthier (proportion of debt / equity, reduction of financing cost).
- Positive effect on profitability (reduction of business risk).

The Athens Exchange as a financing market can offer the following advantages in the context of Greek reality:

- The Athens Exchange, as a source of capital, provides companies with a very significant and competitive alternative source of financing and enables the implementation of important investment plans, which wouldn’t be feasible if dependent on the traditional sources to raise capital, such as bank loans.
- The Athens Exchange leads to the improvement of the capital structure of the domestic corporate community. E.g. The participation of equity in the total capital of the Greek industry reached 45% in 1997, from 28% in 1990. That development provided a rationalization in the market, as it ensured

[2] Jason Draho, 2006, The IPO Decision: Why And How Companies Go Public, Edward Elgar Publishing

independent and self-reliant growth, as well as long-term sustainability in the Greek industry.

The Athens Stock Exchange as a source of capital leads to the dispersion of assets, a fact that contributes positively to the strengthening of the Parliamentary Democracy and the Free Democratic Economy.

Today's capitalism has become a reality. Roughly one million Greeks, almost 23% of the active population, invest in the Athens Stock Exchange. Thus they participate in the national wealth.

This dispersion has also a regional character, as more than the 40% of the capital placed daily in the Athens Exchange comes from investors out of Athens.

Furthermore, the Athens Exchange as source of capital allows the realization of the most complete form of privatisation, which consists of the sale of public assets to private buyers. Privatisation by means of selling stocks through the capital market to the broader investment public was used widely in the developed countries.

For example, the division of the Hellenic Telecommunications Organization's (OTE's) capital in millions of shares has been characterized as a milestone in the history of the Greek Capital market. Of course it should be mentioned that the listing of government owned companies also serves payment purposes, as was the case of the former state owned telecom organization of Greece.

Reasons against Going Public

On the other hand there is the conscious decision of the administration of a company to remain a private company with a small number of stockholders.

The basic reasons that lead a company to remain a private company[3], beyond the cost of going public, are the following:

a) Maintaining control of the company from existing stockholders,
b) The pride that is attached to ownership of the company
c) The ability that is provided to the businessman or business group to realize their vision
d) The maintenance of a participating ownership culture amongst the company's employees.

The secondary reasons, that emanate from the above and lead a company to remain private, are the following:

[3] Sinnett William M., 2002, "Why Private Companies Stay Private", Financial Executive, pp 51-53

1) The company's management focuses on its long-term growth and not on the short-term growth of earnings and the share price. The pressure put by the market on the company's management for impressive short-term performance, which frequently leads to scandals against shareholders, is avoided.
2) The company's management avoids the interventions of other "bosses" out of the company in the decision-making process that relates to employees, products and investments[4].
3) The investment decisions regarding to the introduction of new products are made according to the market's capabilities and not based on the cost of capital, whose measurement faces difficulties and thus may not be reliable.

The decision of a company to remain private imposes certain restrictions as regards to the company's future evolution and growth:

- The company does not have full access to the sources of financing available in the markets. The internal financing constitutes the basic source of financing and is reinforced by short-term and long-term lending capital.
- The financing organizations ask from the stockholders to provide their personal assets as guarantee for the agreement in order to complete a financing agreement.
- The stocks of such companies are not liquid, because they are not often a subject of transaction. In this case, the determination of the valuation of a non public company is based on the methodology which also relates to the tax frame of the particular country.

Of course it is necessary to point out that the adoption of this valuation process differs from the valuation of listed companies and can lead to an overvaluation or under valuation of the price of the stock.

2.3 The Cost of Going Public

The cost of going public[5] should be weighed up against the advantages of listing on the stock exchange in order to make the final decision. Going public involves certain expenses. The listing expenses include the following categories: a) administrative expenses or transaction costs and b) cost of valuation. The cost of listing on the Athens Exchange ranges from 4% to 8% of the value of the issue. The listing process on the Athens Exchange requires the services of underwriters and other experts. Moreover it requires expenses for the publicity and for the writing and circulation of the issue prospectus. It must be also pointed out that the total expenses, according to the existing tax frame, can be amortized within five years.

[4] Tim Jenkinson, Alexander Ljungqvist, 2001, Going Public: The Theory and Evidence on How Companies Raise Equity Finance, Oxford University Press, USA
[5] Ritter, Jay R, 1989, "The Costs of going public", Working paper (University of Michigan. Graduate School of Business Administration. Division of Research) ; -- no. 487.

It is noteworthy to provide a brief description of listing expenses.

- The administrative expenses are distinguished in the following 2 categories:

    1. Direct expenses that arise from the issuer or the intermediary organization that assists in the issue. For example, advertisements related to the issue, dues of listing on the Athens Exchange, legal and other expenses.
    2. The expenses and fees of the underwriter and issue advisor. These expenses are paid either with the form of the difference between the listing price and the price on the issuer, or as a percentage on the total performance, directly from the company. In Greece, the second payment method is customary, and the price difference from the price finally received from investors is named explicit or gross spread.

- The production cost mainly concerns the preparation of the issue, namely all the required audits (financial, legal and tax) as well as the required formal procedures for the realization of the issue, that is to say the submission of relative documentation to the Hellenic Capital Market Commission.

The reputation and competitiveness of the underwriter constitute an important factor for the success of the issue and consequently its fee is not determined only by the direct expenses linked to the sale of issue, but also by his ability to undertake the new offering successfully. This is explained also by the fact that organizing the issue overall requires a particularly complicated and time-consuming process, the planning of which may considerably increase the overall cost.

- The underwriting of a new issue also involves the undertaking of investment risks from the side of the underwriter and consequently a cost of underwriting. The underwriter in the frame of the process of the underwriting guarantees the sale of the securities and assumes relative risks by buying the non sold securities at a specified price, if such are not absorbed by the investment public so that the issue may be concluded successfully. If the market price is lower than the listing price, and consequently the issue is not absorbed partially or totally, the underwriter will suffer loss, provided that the underwriter is forced to buy the part of the issue that was not absorbed in the listing price.

The danger that an underwriter faces is twofold. The one side concerns the uncertainty of market and the probability that it may change at the time that intervenes between the underwriting agreement and the realization of the sale of the securities and is named “waiting risk”. The second concerns the incorrect estimate of the expected market price, which constitutes the base to determine the listing price, and is named “pricing risk”.

The underwriting cost depends on the factors that affect the waiting and price risk. Some of such factors correspond to the duration of the time between the

determination of the price and issue time, the uncertainty on the market price of the titles, the degree of instability of the market, the information the underwriter has in his disposal in order to make the valuation of the securities and his experience and ability to realize this assessment.

- The services of distribution or disposal refer to the organization of the effort to inform investors, attract them so that they register or give purchase orders for new securities and the final distribution and delivery of securities to the buyers. It is essential for the underwriter to allocate enough access channels throughout a large number of investors. These correspond to the distribution cost.

Research has proved that factors such as the international disposal of the securities and the average market volume per investor affect the distribution cost. One of the most basic factors however constitutes the right valuation of the price of the share and its relation to the market price.

If there is high positive deviation between the two, then the issue will not be covered completely. But if the deviation is negative then the issue will be covered relatively in a short period of time, provided that investors judge it is profitable to buy the share.

- The valuation refers to the estimate of the value of the company and therefore to determining the share price. The mission of underwriters focuses on defining, with the largest possible accuracy, the listing price, in order to approach the market price as more efficiently as possible. The difference between the estimated price and the market price constitutes the implied cost or valuation cost.

The correct valuation of the share price requires the right estimation of the internal value of the share, as well as the conditions of demand and supply in the market. The underwriter is responsible for the collection and study of all the necessary information required for the above task.

The larger the instability of the capital market and the volatility of the price, the more difficult the collection of necessary information for the price estimation, and therefore the larger the valuation cost. The powerful reputation and experience of the underwriter often constitute a guarantee for the company and investors as regards to the correct estimation of the share price. This is true because an experienced underwriter has larger capabilities and a more complete knowledge of the market and therefore can determine the share price more accurately. Nevertheless the presence of an experienced underwriter, due to its stronger capabilities, will considerably increase the valuation cost.

Companies wish to achieve the highest possible listing price in the primary market so as to collect greater capital proceeds. On the other hand underwriters tend to underestimate the share because if the share price is

considered high in the primary market, then there is risk that all the shares may not be sold. If this happens then, apart from the fact that underwriters are obliged to buy the shares that have not been purchased from the broader investment public, there is also risk that the share price will be declining during the initial trading day of the share in the secondary market of Athens Exchange. As to the valuation of the stocks, there is a conflict between underwriters and the company. For the valuation of the stock we should take the following into consideration:

a) the change in the share price and
b) the change in the general price level of shares listed on the Athens Exchange.

Specifically, it is calculated the change in the share price of a company in relation with the change of the Athens Stock Exchange Index. The following equation is utilized:

$$\frac{(P1 - P0)}{P0} : \frac{(Ä1 - Ä0)}{Ä0} = \left(\frac{P1}{P0} - 1\right) : \left(\frac{Ä1}{Ä0} - 1\right)$$

$$\left(\frac{P1}{P0} \times \frac{Ä1}{Ä0}\right) - 1$$

$$\left[\left(\frac{P1}{P0} \times \frac{Ä1}{Ä0}\right) - 1\right] \times 100$$

Where,

P1 = closing price of share on the initial trading day on the Athens Exchange,

P0 = issue price of the share in the primary market,

Δ1 = closing price of the index on the day the share price is determined in the primary market,

Δ0 = index price during the day the share price is determined in the primary market.

If the price from the above relationship is positive, then there is a discount, if it is negative then there is an over-valuation in the primary market

Example

The following data are given:

P1 = €1,200, P0 = €1,000, Δ1 = €2,400, Δ0 = €2,200

Using these numbers it is found:

$$\left[\left(\frac{1200}{1000} \times \frac{2200}{2400}\right) - 1\right] \times 100 = 10\%$$

Chapter 3
The Regulatory Framework of Initial Public Offerings in the Athens Exchange[6]

3.1 Prerequisites for Listing of Stocks and Classification into Segments in the Athens Exchange

The prerequisites for listing of stocks in the securities market of Athens Exchange are determined by Law 3371/2005 and the Athens Exchange Rulebook. The following articles of Rulebook determine the frame for listing of stocks in the securities market.

Article 3.1.1.

(1) The admission for the first time of Transferable Securities of issuers to the Securities Market and their classification into the segments 'Mid & Small Cap', 'Big Cap', 'Exchange-Traded Funds' and 'Structured Financial Products', is carried out subject to fulfilment of the requirements laid down in the aforesaid paragraph depending on the case in question. For the purposes of the above, 'issuers' shall mean those persons as provided in legislation in force which list Transferable Securities in the Securities Market of ATHEX.

(2) The admission of Transferable Securities to the Securities Market and classification into the aforementioned segments requires a decision of ATHEX which is taken in accordance with the stipulations of Rulebook.

(3) With regard to both the admission of stocks and the regular review held in accordance with the provisions of § 3.1, preference stocks are classified in the same segment as the issuer's common stocks.

(4) Listed Transferable Securities that fulfil: a) the criteria of § 3.1.2.4. are classified in the 'Low Free Float, Low Liquidity and Special Trading Characteristics' Segment and b) the criteria of § 3.1.2.5. are classified in the 'Under Surveillance' Segment.

[6] This chapter is based on the *ATHEX Rulebook*, version 8, www.ase.gr

Article 3.1.2.1. Prerequisites for the 'Mid & Small Cap' Segment

The admission for the first time of stocks to the Securities Market and their classification into the 'Mid & Small Cap' Segment requires, in addition to the preconditions of Law 3371/2005, cumulative fulfilment also of the following preconditions:

Article 3.1.2.1.1. Shareholders' Equity

At the time of filing of the listing application, the shareholders' equity of the issuer must be at least three million (3,000,000) euro on a consolidated basis or, in the event of non-consolidation, the aforesaid criterion must be satisfied by the issuer alone. This precondition does not apply to the admission of an additional series of stocks of the same category as those already admitted for trading.

Article 3.1.2.1.2. Financial Statements

(1) The issuer must have published or submitted for publication, in accordance with the provisions of legislation in force, its annual financial statements for at least three (3) fiscal years prior to its listing application. In the case of foreign companies, publication must be in accordance with I.A.S./I.F.R.S. or, in the case of issuers of some third country, with equivalent accounting standards (by way of indication US GAAP) pursuant to provisions in force.

(2) The financial statements must have been audited by a certified auditor. If the company prepares also consolidated financial statements, the same applies to these statements too, as well as to the statements of the companies included in the consolidation, according to the full consolidation method, of the last – prior to submission of the listing application – published fiscal year.

(3) Issuers that have published financial statements for less than three fiscal years shall be admitted for trading only after the approval of the Hellenic Capital Market Commission.

Article 3.1.2.1.3. Profitability

(1) The issuer must report minimum profits before taxes and minority interest for the last three years of four million (4,000,000) euro and not less than one million (1,000,000) euro per year, earnings before interest, tax, depreciation and amortization (EBITDA) for the last three years of at least six million (6,000,000) euro and not less than one million five hundred thousand (1,500,000) euro per year, on a consolidated basis or on a non-consolidation basis if there are no other companies.

(2) The precondition of the preceding paragraph is not applicable:

a) to issuers which by virtue of special provisions are obliged to submit an application for admission for trading on ATHEX within a specific period of time or to companies which obtain approval from the Hellenic Capital Market Commission in accordance with § 3.1.2.1.2. (3),
b) to issuers with capitalization (estimated listing price multiplied by the number of shares to be listed at the time the listing application decision is taken) higher than 300 million euro, following a relevant decision of the Board of ATHEX,
c) to the admission of an additional series of stocks of the same category as those already admitted,
d) to issuers with stocks admitted for a second time to the Securities Market of ATHEX following a relevant decision of ATHEX.

Article 3.1.2.1.4. Free Float

(1) The issuer must have an adequate free float (proportion of listed stocks freely available for trading) by not later than the time of receipt of the decision approving its admission for trading. The free float is deemed to be adequate in the following instances:

a) when the stocks to be admitted are distributed among the general public in a percentage of at least twenty-five percent (25%) of the total stocks of the same category and more specifically are distributed to at least two thousand (2,000) persons, none of whom holds more than two percent (2%) of the total stocks for which admission is being requested, or
b) when, in the case of issuers with capitalization at least equal to or higher than one billion (1,000,000,000) euro, stocks are distributed in a percentage of at least fifteen percent (15%) of the total stocks to at least ten thousand (10,000) persons, none of whom holds more than two percent (2%) of the total stocks for which admission is being requested. Specifically in the case of portfolio investment companies, the minimum number of persons to whom the stocks are distributed in accordance with the above instances a) and b) is three hundred (300).

(2) For the purpose of estimating the adequacy of the free float, the percentages of the issuer's share capital held by the following persons will not be taken into account: members of its Board of Directors, management officers of the issuer, relatives within the first degree of kinship of existing shareholders that directly or indirectly hold at least five percent (5%) of its share capital, and of its management officers, or existing shareholders that acquired shares in the calendar year preceding the year of submission of the listing application, unless they are institutional investors or venture capital companies.

(3) By way of exception, it is permitted for stocks to be admitted for trading on the Securities Market without fulfilling the free float criterion stipulated in §3.1.2.1.4. (1) at the time the decision is taken approving their admission for trading, provided a free float has been achieved of not less than five percent (5%) and provided for the purpose of achieving an adequate free float following admission, the procedure laid down in § 2.5.2. is followed.

(4) In cases where the issuer's stocks are already being traded on other, outside Greece, regulated markets of one or more EU member states or third countries, or are to be listed simultaneously on other such markets, for the fulfilment of the free float criterion of § 3.1.2.1.4. (1) the existing free float on the relevant exchanges or the free float to be achieved on the other exchanges respectively is also taken into account. In such cases, stocks must have been distributed in Greek territory – according to DSS data – in a percentage of not less than five percent (5%) of the total stocks to at least 100 persons, none of who holds more than two percent (2%) of the total stocks for which admission is being sought.

(5) In the case of the admission for trading of an additional series of stocks of the same category as those already admitted, ATHEX determines the adequacy of the free float in accordance with the specific provisions contained in the Rulebook.

Article 3.1.2.1.5. Tax Audit

The issuer must have undergone a tax audit, with respect to all tax matters, for all the fiscal years that its annual financial statements – with the exception of the most recent – have been published at the time of submission of the listing application. If the issuer has the obligation to prepare consolidated financial statements, the tax audit obligation of the preceding subparagraph applies also to those companies which should have been included in the last consolidation prior to submission of the listing application, on the basis of the full consolidation method, for those fiscal years in which consolidated financial statements have been prepared with the exception of the last. If the registered office of the issuer or of the company which, pursuant to the preceding subparagraphs, must undergo a tax audit, is not in Greece, the audit shall be carried out by a recognized auditing and accounting firm of international standing, which shall prepare a special report on any tax obligations the company may have.

Article 3.1.2.1.6. Corporate Governance

The issuer must comply with the provisions in force pertaining to corporate governance.

Article 3.1.2.1.7. Prohibition on the Transfer of Stocks

(1) Shareholders, who at the time of approval of the listing of stocks on the Securities Market are participating with a percentage of more than 5% in the share capital of the issuer, shall be permitted to transfer during the first (1st) year after the listing stocks that represent a maximum of twenty-five percent 25% of their total stocks. The provision of the preceding paragraph is not applicable in cases of transfer due to inheritance, quasi-universal succession or bequest, transfer between shareholders that are subject to the provision of the preceding paragraph, transfer of a block of stocks to a strategic investor that expressly undertakes the obligation not to transfer stocks in excess of the limit stipulated in the preceding subparagraph, or transfer to a Member that is acting as Market Maker.

(2) The provisions of the preceding paragraph apply also in the case where the issuer's stocks are transferred to another segment of the Securities Market.

(3) Specific issues pertaining to the obligation not to transfer stocks, and in particular the procedure and necessary supporting documents for lifting the transfer prohibition, may be regulated by virtue of a Decision of ATHEX.

Article 3.1.2.1.8. Sponsor

(1) The issuer must appoint a Member of the Securities Market having the right to provide underwriting services in a public offering as its Sponsor for the two (2)years following initial listing on the exchange. The Sponsor shall have the following obligations:

a) it must have been duly licensed as a Market Maker for the respective stock and enter buy and sell orders (quotes) in accordance with the provisions stipulated in this Rulebook,
b) it must publish an analysis of the issuer on completion of twelve (12) months' trading on ATHEX and
c) it must make two (2) presentations of the issuer annually to investors in the Athens Exchange.

(2) The obligations of the preceding paragraphs are not applicable in cases where the issuer's stocks are transferred to another segment of the Securities Market.

Article 3.1.2.1.9. Formation of a Group

For the purpose of approving the listing of an issuer's stocks, ATHEX may – if it considers that the activity of the issuer that has submitted an application for the listing of its stocks does not display cohesion and completeness, resulting in the creation of some danger for the investing public – request the

acquisition of associated (in the sense of article 42e of Codified Law 2190/1920) companies and/or companies having the same shareholder structure, by the issuer or the absorption of specific companies or divisions of companies associated (in accordance with the above) with the issuer that submitted the application or even additional guarantees which ATHEX considers necessary for protecting the interests of the investing public. For the performance of these actions, ATHEX may set a reasonable time limit, after the lapse of which, if no action has been taken, the listing application will be rejected.

Article 3.1.2.1.10. Evaluation of an Issuer's Suitability

For the purpose of approving a listing application, ATHEX may request and evaluate additional details pertaining to the suitability of the stocks of the issuer for their listing on a specific market, particularly with respect to the financial situation of the issuer, its sector of activity and general course, the management and handling of corporate affairs and the quality of its corporate governance procedures. This evaluation is carried out on the basis of the data provided to ATHEX in the suitability questionnaire and the corporate profile form, which are submitted in accordance with a relevant Decision of ATHEX upon commencement of the listing procedure.

Article 3.1.2.1.11. Minimum Value of Stocks Offered

In the case of a public offering, the total value of the stocks offered must be at least two million (2,000,000) euro. This requirement does not apply in the case of a secondary or parallel listing.

Article 3.1.2.2. Prerequisites for the 'Big Cap' Segment

The admission for the first time of stocks to the Securities Market and their classification into the ‘Big Cap’ Segment requires fulfilment of all the preconditions of § 3.1.2.1. and additionally of the following preconditions, which are calculated on a consolidated or individual basis, depending on the case.

Article 3.1.2.2.1. Shareholders' Equity

The issuer’s shareholders’ equity must be at least fifteen million (15,000,000) euro at the time of submission of the listing application.

Article 3.1.2.2.2. Profitability

The issuer must report minimum profits before taxes for the last three years of twelve million (12,000,000) euro and not less than three million (3,000,000) euro per year, earnings before interest, tax, depreciation and amortization (EBITDA) for the last three years of at least sixteen million (16,000,000) euro and not less than four million (4,000,000) euro per year. This precondition is

not applicable in the cases of issuers whose stocks are admitted to the Securities Market by making use of the profitability exception set out in instances (a), (b) and (d) of § 3.1.2.1.3.

Article 3.1.2.2.3. Capitalization

The issuer's total capitalization must be at least one hundred and fifty million (150,000,000) euro, as determined on the basis of the lowest price of the price range of the public offering.

Article 3.1.2.2.4. Exemption

The preconditions of §§ 3.1.2.1.7. and 3.1.2.1.8. are not applicable in the case of issuers that fulfil the requirements of §§ 3.1.2.2.1. and 3.1.2.2.2.

Article 3.1.2.3. Regular Review of Classification in the 'Big Cap' and 'Mid & Small Cap' Segments

The classification of stocks in the Big Cap and Mid & Small Cap segments shall be subject to regular half-yearly review. The review requires a decision of ATHEX which is taken in the months of October and April, unless a different date is specified by ATHEX in a relevant announcement. Any changes resulting from the review shall come into force as of the date of effect of any changes made during the regular half yearly reviews of the composition of the FTSE/ATHEX indexes. In the event of the transfer of stock from one segment to another, all other types of the stock of the same issuer are also compulsorily transferred thereto. Regarding the review of classification in the above segments, the criteria of the following paragraphs shall be applicable.

Article 3.1.2.3.1. Transfer from the 'Mid & Small Cap' Segment to the 'Big Cap' Segment

A stock may be transferred from the Mid & Small Cap Segment to the Big Cap Segment during the first review in which it is ascertained that the stock meets one of the following criteria:

a) Its total capitalization is higher than one hundred million (100,000,000) euro.
b) Its free float is higher than twenty percent (20%).
c) Its liquidity is higher than twenty percent (20%).
d) The stock has not had, during the six-month prior to the review, a weighted velocity of over two hundred percent (200%).

Article 3.1.2.3.2. Transfer from the 'Big Cap' Segment to the 'Mid & Small Cap' Segment

A stock is transferred from the Big Cap Segment to the Mid & Small Cap Segment in the following cases:

a) If it is ascertained that in two successive reviews the stock meets one of the following criteria:

i) Its free float is less than twenty percent (20%) and higher than eighteen percent (18%).
ii) Its liquidity is less than twenty percent (20%) and higher than fifteen percent (15%).
iii) Its average capitalization is less than one hundred million (100,000,000) euro and higher than ninety-five million (95,000,000) euro.
Transfer may be in effect even if the criterion is different at each review.

b) If, in the first review, it is ascertained that the stock meets one of the following criteria:

i) Its free float is less than eighteen percent (18%).
ii) Its liquidity is less than fifteen percent (15%).
iii) The average capitalization for the six-month period is less than ninety five million (95,000,000) euro.

Article 3.1.2.3.3. Special Provisions

(1) Stocks are classified in the Big Cap segment with the assent of the issuing company. Issuers that are classified in this segment are subject to the additional obligations of § 4.1.4.3 of the Rulebook.

(2) During the review, the capitalization criterion is examined on the basis of the average capitalization of the six-month period preceding the review. For the purposes of these presents, the six-month period preceding the review is, in the case of the first six-month period, the six-month period ending on the last business day in the month of September and, in the case of the second six month period, the six-month period ending on the last business day in the month of March.

(3) For the purpose of calculating liquidity, the average for the six-month period preceding the review is taken into account. For the purpose of this calculation, double the aggregate of daily liquidity for the period under examination is taken into account.

(4) The free float criterion is examined on the basis of the data for the last business day of the months of September and March, as these data emerge from the data of the DSS. The free float is calculated as the aggregate of the percentages of participation in the share capital of the issuer of the total stocks participating with a percentage of less than two percent (2%) in the share capital of the issuer.

(5) If at the time of the first listing of stocks the free float criterion was determined on the basis of instance (b) of § 3.1.2.1.4. (1), the adequate free

float percentage for classifying or keeping the issuer's stocks in the Big Cap Segment is determined as follows:

a) For the period from first admission until the third (3rd) regular review that follows the first (1st) calendar year of the year of first admission, the said percentage should be no less, at the time of the review, than four-fifths (4/5) of the free float percentage of instance (b) of § 3.1.2.1.4. (1).
b) After the lapse of the time period under a), the said percentage should not be less, at the time of the review, than four-fifths (4/5) of the free float percentage of instance (a) of § 3.1.2.1.4. (1).

In all cases, this percentage cannot be less than five percent (5%).

Article 3.1.2.4. 'Low Free Float, Low Liquidity and Special Trading Characteristics' Segment

(1) Stocks of issuers are classified in the Low Free Float, Low Liquidity and Special Trading Characteristics Segment, provided one of the following conditions is met:

a) The free float of the stocks is less than fifteen percent (15%) of total common stocks.
b) Their liquidity is less than five percent (5%).
c) Their trading price is less than thirty eurocents (0.30).
d) If, due to extraordinary events announced by the issuer, by way of indication a public offering or other acquisitions of holdings, the free float falls below ten percent (10%).
e) The issuer's total annual receipts from its productive activity is less than three million (3,000,000) euro.

(2) If, at the time of the first admission for trading of stocks, the free float criterion was determined on the basis of instance (b) of § 3.1.2.1.4. (1), instance (a) of the preceding paragraph is not applied. In such a case, low free float is taken to be a free float that is less than two-fifths (2/5) of the percentage of the initial listing. Under no circumstances can this percentage be less than five percent (5%).

(3) By virtue of its decision, ATHEX may specify the way in which the criteria pertaining to these Segments are applied.

Article 3.1.2.5. 'Under Surveillance' Segment

(1) The Under Surveillance Segment is reserved for the stocks of issuers which are admitted when at least one of the following criteria is met:

a) The issuer has negative net worth.

b) The issuer's losses in the fiscal year are greater than thirty percent (30%) of net worth and the issuer has not convened a General Meeting for the purpose of increasing its share capital.
c) The issuer has sizeable overdue debts.
d) Submission of an application for the issuer to be made eligible for the provisions of articles 44 to 46 of Law 1892/1990.
e) An announcement has been made or events have occurred, which give rise to serious doubts or uncertainty about the issuer's ability to continue its business activity.

(2) The criteria of instances a) and b) of the preceding paragraph are examined on the basis of the annual consolidated financial statements and, in the event that consolidated financial statements are not prepared, on the basis of the financial statements of the parent company. The financial results shall be considered to be the group's results after tax and minority interests or, in the case where consolidated financial statements are not prepared, the results after tax.

(3) In cases of the indirect admission of an unlisted company or of a listed company which decides to become active in a branch that is not related or complementary to its activity, and provided there is a significant impact on the economic fundamentals of the listed company, its stocks may be transferred to the Under Surveillance segment for a period of at least six (6) months. The stocks shall remain in this segment at least until publication of the first half yearly or annual financial statements to be published after the aforesaid six month period and which show the results and asset position of the listed company following its commencement of activity in the new branch.

(4) In cases of a listed company which decides to become active in a branch for which special terms and conditions have been instituted for admission to the Securities Market, or of a listed company which decides to become active in a branch for which the obtaining of special administrative or other types of permits is required, the stocks of the listed companies are transferred to the Under Surveillance segment until such time as the licenses are obtained or the terms and conditions are fulfilled, as the case may be.

(5) Stocks are also placed under surveillance when their issuers commit a breach of the obligations laid down in Sections 4 and 5, as well as in the case of the lifting of suspension in accordance with § 5.4 of the Rulebook.

(6) In the case of lifting of suspension, the stocks of the issuer remain in the Under Surveillance Segment for one (1) month and are then transferred to the Mid & Small Cap Segment.

(7) The stocks of issuers are also placed in the Under Surveillance segment if the Hellenic Capital Market Commission ascertains a) vague or negative observations in the report of the certified auditor, b) omissions in the periodic or annual financial statements, inadequate or incorrect observance of

obligations pertaining to the preparation or publication of the annual or half-yearly financial report or of the quarterly financial statements, in relation to the stipulations of legislation in force, c) failure of the issuers to comply with legislation on corporate governance or the ascertainment of serious omissions in its implementation. Stocks are transferred to the Under Surveillance segment following ascertainment of the relevant reasons by the Hellenic Capital Market Commission, or at the latter's request, by ATHEX in the next session after the receipt by ATHEX of the notification regarding the aforesaid ascertainment or request. The Board of Directors of ATHEX is informed of stocks being transferred to this segment at its immediately following meeting.

(8) In forming its opinion as to whether stocks should be placed in the Under Surveillance Segment or not, ATHEX may additionally take into consideration details that have been made known by the company and which adequately substantiate the fulfilment or not of the criteria for placing stocks under surveillance.

(9) For the purpose of transferring to the Under Surveillance segment the stocks of issuers which have been placed, in the exercise of their activity, under special supervision by a Competent Authority, information or opinions are also taken into consideration that have been made known to ATHEX by that Authority. In the event that the Competent Authority fails to respond to ATHEX's request to be notified regarding the above information or opinions, ATHEX may, within a reasonable time period, place the stocks of the issuer in question in the Under Surveillance Segment even without the assistance of the aforesaid Authority.

(10) ATHEX may, by virtue of its decision, specify the manner of applying the criteria for placing stocks in or removing them from the Under Surveillance Segment.

Article 3.1.2.6. Review of Classification in the 'Under Surveillance' Segment and 'Low Free Float, Low Liquidity and Special Trading Characteristics' Segment

(1) The check relating to the classification of stocks in the Under Surveillance Segment in accordance with instances a), b) and c) of § 3.1.2.5. (1) is carried out once a year, during the first meeting of the Board of Directors of ATHEX after the deadline set for the publication of annual financial statements, unless ATHEX has set some other date in a relevant announcement.

(2) The check relating to the classification of stocks in the 'Low Free Float, Low Liquidity and Special Trading Characteristics' Segment with respect to instances a) and b) of § 3.1.2.4. (1) is carried out twice a year in the months of April and October, unless ATHEX has set some other date in a relevant announcement.

(3) The review for the classification of stocks in the Under Surveillance segment, in accordance with instances (d) and (e) of § 3.1.2.5. (1), with §§ 3.1.2.5. (3) to (5) and § 3.1.2.5. (7), takes place during extraordinary reviews.

(4) In order for stocks to be reinstated, the following requirements must be satisfied cumulatively:

(a) The reasons for placing the securities in the segment must no longer apply.
(b) At the time of review, none of the criteria must be met for placing the securities in the segment.
(c) The auditors' report that accompanies the financial statements has their approval. When they are removed from the above segment, the issuer's stocks are placed in the Mid & Small Cap segment or Big Cap segment depending on the criteria they fulfil. This classification of companies is carried out during the first regular review held after removal of the stocks from the Under Surveillance Segment. In forming its opinion as to the review of whether stocks should be in the Under Surveillance or not, ATHEX also considers the need to ensure the smooth operation of the market and protect investors.

(5) Reinstatement in instances a) and b) of § 3.1.2.4. (1) takes place in principle during the regular half-yearly review. The removal of an issuer's stocks from the aforesaid segment may also be decided outside the framework of the regular review at the request of the issuer, particularly if at the time of admission of a supplementary series of stocks from a share capital increase of the issuer, the latter is considered to have an adequate free float.

(6) Reinstatement in instances a), b) and c) of § 3.1.2.5. (1) takes place after submission of a request by the issuer and on the basis of the financial statements for each calendar half year. In the event of classification in this segment for reasons pertaining to a reduction of shareholders' equity, reinstatement is also permitted outside the framework of the regular half-yearly review, provided the shareholders' equity is increased. In such a case, reinstatement takes place at the time of admission of the new stocks resulting from the increase.

(7) If classification in the Under Surveillance segment took place during an extraordinary review, reinstatement in the initial segment may takes place outside the framework of the regular review, provided the reasons for the aforesaid classification no longer apply and there are no other reasons for such classification.

(8) Specifically in cases in which classification in the 'Low Free Float, Low Liquidity and Special Trading Characteristics' Segment took place due to a low trading price (less than € 0.30), reinstatement takes place provided the trading price is higher than € 0.40.

(9) In cases of classification in the Under Surveillance Segment following ascertainment by the Hellenic Capital Market Commission of the reasons for such classification or at its request, reinstatement is carried out by ATHEX following the forwarding to it of the assent of the Hellenic Capital Market Commission.

(10) By its Decision, ATHEX may specify the method of calculation and application of the criteria, requirements and details which must be taken into consideration for the purpose of implementing § 3.1.2.6. (4).

Article 3.1.2.7. Special Provision

The stocks of companies, other than portfolio investment companies, whose capital has been placed primarily in other listed companies, will not be accepted for listing.

3.2 The Procedure for Admission

The procedure for examining listing applications is conducted in accordance with the stipulations contained in the following articles of Athens Exchange Rulebook. By virtue of its Decision, ATHEX may specify all relevant details such as, in particular, the time limits for examining listing applications, including the time limits for examining and submitting supplementary data.

Article 3.1.8.2.1. Stage 1: Evaluation of the Listing Application by ATHEX

(1) The issuer or the Offeror files, jointly with the Consultant, and if there is no Consultant, jointly with the Lead Underwriter, an application for the listing of its stocks on ATHEX under the following terms:

a) The issuer may request the admission of its stocks also to a Market or segment thereof other than that to which its main application relates.
b) The application is accompanied by a supplementary questionnaire pertaining to suitability together with the necessary supporting documents specified by Decision of ATHEX.
c) Any application with incomplete supporting documents will not be accepted. The respective dossier may be supplemented only by means of a new application.

(2) ATHEX then checks the dossier and listing requirements, whilst the listing requirements and assessment of the issuer's suitability are also checked and evaluated.

(3) ATHEX notifies the Consultant and/or Lead Underwriter and the issuer or the Offeror, and if there is no Consultant, the Lead Underwriter, in writing concerning any ad hoc requirements which may be set by ATHEX in order for it to accept the listing application.

(4) The Consultant, and if there is no Consultant the Lead Underwriter, replies in writing concerning the requirements set in accordance with the preceding paragraph.

(5) Special reference is made to the requirement of an adequate free float, which may be achieved after the public offering in accordance with § 2.5.2 of the Rulebook.

(6) It is not necessary for the above procedure to be completed before the issuer submits the application to the Hellenic Capital Market Commission for the approval of its prospectus and the granting of permission for the public offering as the case may be.

(7) ATHEX decides whether to accept the listing application.

Article 3.1.8.2.2. Stage 2: Approval of Admission

(1) Prior to the holding of the public offering, the following take place:

a) The issuer, via the Consultant, and if there is no Consultant via the Lead Underwriter, must submit to ATHEX a photocopy of the approved prospectus, whenever this is required by provisions in force, in dissertation and electronic form in order for it to be published on the ATHEX website.
b) The issuer, via the Consultant, and if there is no Consultant via the Lead Underwriter, must submit to ATHEX a photocopy of the decision of the Hellenic Capital Market Commission approving the content of the prospectus, whenever this is required by provisions in force, and of the permit granted by the Hellenic Capital Market Commission for the holding of the public offering.
c) In all cases, ATHEX may receive the above permit directly from the Hellenic Capital Market Commission.

(2) After the public offering, the following take place in the order presented:

a) The issuer, via the Consultant, and if there is no Consultant via the Lead Underwriter, must submit to ATHEX the supporting documents for the taking of the decision on admission, as these documents are specified by virtue of a Decision of ATHEX, within five (5) business days from the completion of the public offering.
b) ATHEX decides on admission.
c) In the case of admission with application of the exemption regarding adequate free float as provided in § 3.1.2.1.4. (3), admission is approved with the condition subsequent that no free float has been achieved.

Article 3.1.8.2.3. Stage 3: Commencement of Trading

In this stage, the following take place in the order presented:

> a) The issuer or the Offeror submits to ATHEX, jointly with the Consultant, and if there is no Consultant jointly with the Lead Underwriter, the supporting documents for the taking of the decision on admission, as these documents are specified by virtue of a Decision of ATHEX.
> b) ATHEX checks the completeness of the supporting documents submitted by the issuer.
> c) Trading in the issuer's stocks commences within fifteen (15) calendar days from the date on which ATHEX approved the admission of the stocks.

i) The listing application is rejected by ATHEX in the case of non-fulfilment of the listing requirements stipulated in this Section or of any ad hoc requirements which may have been set by ATHEX. In the case of rejection of an application, ATHEX duly informs the Hellenic Capital Market Commission and notifies the rejection to the issuer and the Lead Underwriter or Consultant. In the case of rejection of an application in accordance with the preceding subparagraphs, the issuer who filed the listing application may, within ten (10) calendar days of receiving notification of the decision of ATHEX, request the revocation of the decision of ATHEX rejecting the application, setting out the grounds on which its request is based. If the request is accepted by ATHEX, the admission procedure is resumed from the stage it had reached.

ii) The listing application is also rejected by ATHEX if the prospectus is not approved by the Hellenic Capital Market Commission. In the case of rejection of a listing application, the Hellenic Capital Market Commission is informed accordingly and the rejection is notified to the issuer and the Lead Underwriter.

d) In order for the trading of the issuer's stocks to commence on ATHEX, the clearing of the stocks must have been performed in accordance with the law and all subscriptions (lump sum and periodic) stipulated by Decision of ATHEX in cases of new admissions must have been paid.

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Chapter 4
Literature Review of Initial Public Offerings

[Please note that there are additional references of IPO literature in Chapter 5 of the research report.]

4.1 Introduction

In the context of initial public offerings, the behaviour of share prices during their initial listing date on the stock market and during the period even after the first three years following their listing has been examined by various studies and discussions both within the scientific community and amongst those participating in the market. The international bibliography mentions the "under-pricing phenomenon" of initial public offerings (indicatively it is mentioned the research by Ritter (1984), (1991) and (2003), Lee et al. (1996b), Kunz and Aggarwal (1994), Krishnamurti and Kumar (1999), Levis (1993)) during the first trading days. This suggests that the new companies list their shares on the stock market under priced, namely they define an issue (offering) price lower than the real value of the company in order to render the IPO attractive for investors and to achieve a full absorption and/or over-coverage of the IPO.

4.2 IPOs in Greece

As regards to the IPO market in the Greek stock exchange, the several studies that have been performed [Tyligada (1994), Kazantzis and Levis (1995), Papaioannou and Travlos (1995), Papamathaiou (1996), Travlos, Papaioannou, Philippas and Safieddine (1997), Nounis (2000), Georgiadis (2003)] converge to the conclusion that share prices of newly listed companies present positive performance during the initial trading days. However, this does not absolutely hold for their long-term performance.

Specifically, in her research, Tyligada examined the listing of new companies on the Athens Stock Exchange for the period 1971-1994. The share prices were under priced by 40% on average. Papaioannou and Travlos examined the period 1/1/1987-28/9/1994, and reached the conclusion that the average investment return gained by those who purchase shares during IPOs and subsequently sell such during the first listing day, is almost 34% higher than the stock market return during the same period.

The research by Kazantzis and Levis on IPOs in the Greek stock market for the period 1987 – 1991 provided an average initial return of 48.5%. In another dissertation, Papamathaiou examined the public offerings for the period 1987-1995 and found an average initial return of 20.37%.

Moreover, Kazantzis and Thomas examined IPOs for the period 1987-1994. Their findings indicated an average initial return of 50.89% and an adjusted (for market changes) return of 51.73%. Also, Kollintzas, Sfakianakis and Tyligada jointly examined the new share listings during the period 1972-1994 and found an average initial return of 26.3%. In another study, Lazaridis, Livanis & Kolyvopoulos examined IPOs for the period 1995-1999. According to their results, IPOs during the period were under priced by 113.63% on average. On the contrary, during the period even after the first three years following their initial listing on the stock market, the average return was 40.22%.

In a more recent study, Nounis examined the period 1976-2003 and found an average return of 27.5% for the 345 public offerings that took place during the period, while the respective calculated average weighted return reached 39%.

Finally, Livanis *et al* (2005) studied the return during the initial 3 trading days of newly listed shares in two sub-periods (from 1995 to 1999 – a boom period for the Greek stock market – and from 2000 until 2003 – a downside period for the General Index and a period characterized by lack of trust in the stock market from a significant portion of investors) in order to derive the most representative results as possible. The results indicated an average initial return of 106.8% for the period 1995-1999 and an average initial return of 39% for the period 2000-2003.

4.3 International Evidence in IPOs

The international bibliography on the performance of IPOs indicates that listings of new shares on stock markets overall bear positive initial returns. The results from 45 different countries, as such are aggregately presented by professor J.R. Ritter, present average returns for the first or third day of trading ranging from 4.2% (Russia) until 164.5% (China). In detail, as presented in the following table, the average initial returns of IPOs in 45 capital markets examined globally were as follows:

TABLE 1: Average Initial Returns of IPOs in 45 Capital Markets

Country	Source	Sample Size	Time Period	Avg. Initial Return
Argentina	Eijgenhuijsen & van der Valk	20	1991-1994	4.4%
Australia	Lee, Taylor & Walter; Woo; Pham; Ritter	1,103	1976-2006	19.8%
Austria	Aussenegg	96	1971-2006	6.5%
Belgium	Rogiers, Manigart & Ooghe; Manigart DuMortier; Ritter	114	1984-2006	13.5%
Brazil	Aggarwal, Leal & Hernandez; Saito	180	1979-2006	48.7%
Bulgaria	Nikolov	9	2004-2007	36.5%
Canada	Jog & Riding; Jog & Srivastava; Kryzanowski, Lazrak & Rakita; Ritter	635	1971-2006	7.1%
Chile	Aggarwal, Leal & Hernandez; Celis & Maturana; Ritter	65	1982-2006	8.4%
China	Chen, Choi, and Jiang (A shares)	1,394	1990-2005	164.5%
Cyprus	Gounopoulos, Nounis, and Stylianides	51	1999-2002	23.7%
Denmark	Jakobsen & Sorensen; Ritter	145	1984-2006	8.1%
Finland	Keloharju	162	1971-2006	17.2%
France	Husson & Jacquillat; Leleux & Muzyka; Paliard & Belletante; Derrien & Womack; Chahine; Ritter	686	1983-2006	10.7%
Germany	Ljungqvist; Rocholl: Ritter; Vismara	700	1978-2008	25.3%
Greece	Nounis, Kazantzis & Thomas	363	1976-2005	25.1%
Hong Kong	McGuinness; Zhao & Wu; Ljungqvist & Yu; Fung, Gul, and Radhakrishnan; Ritter	1,008	1980-2006	15.9%
India	Marisetty and Subrahmanyam	2,811	1990-2007	92.7%
Indonesia	Hanafi; Danny; Suherman	339	1989-2008	21.5%
Iran	Bagherzadeh	279	1991-2004	22.4%
Ireland	Ritter	31	1999-2006	23.7%
Israel	Kandel, Sarig & Wohl; Amihud & Hauser; Ritter	348	1990-2006	13.8%
Italy	Arosio, Giudici & Paleari; Cassia, Paleari & Redondi; Vismara	268	1985-2008	16.4%
Japan	Fukuda; Dawson & Hiraki; Hebner & Hiraki; Pettway & Kaneko; Hamao, Packer, & Ritter; Kaneko & Pettway; Ritter; TokyoIPO.com	2,628	1970-2008	40.1%
Korea	Dhatt, Kim & Lim; Ihm; Choi & Heo; Mosharian & Ng; Cho; Ritter	1,490	1980-2008	55.2%
Malaysia	Isa; Isa & Yong; Yong	350	1980-2006	69.6%
Mexico	Aggarwal, Leal & Hernandez; Eijgenhuijsen & van der Valk	88	1987-1994	15.9%
Netherlands	Wessels; Eijgenhuijsen & Buijs; Jenkinson, Ljungqvist, & Wilhelm; Ritter	181	1982-2006	10.2%
New Zealand	Vos & Cheung; Camp & Munro; Ritter	214	1979-2006	20.3%
Nigeria	Ikoku; Achua	114	1989-2006	12.7%
Norway	Emilsen, Pedersen & Saettem; Liden; Ritter	153	1984-2006	9.6%
Philippines	Sullivan & Unite; Ritter	123	1987-2006	21.2%
Poland	Jelic & Briston; Ritter	224	1991-2006	22.9%
Portugal	Almeida & Duque; Ritter	28	1992-2006	11.6%
Russia	Ritter	40	1999-2006	4.2%
Singapore	Lee, Taylor & Walter; Dawson; Ritter	519	1973-2008	27.4%
South Africa	Page & Reyneke	118	1980-1991	32.7%
Spain	Ansotegui & Fabregat; Alvarez Otera	128	1986-2006	10.9%
Sri Lanka	Samarakoon	115	1987-2007	48.9%
Sweden	Rydqvist; Schuster; Simonov; Ritter	406	1980-2006	27.3%
Switzerland	Kunz,Drobetz, Kammermann & Walchli; Ritter	159	1983-2008	28.0%
Taiwan	Chen	1,312	1980-2006	37.2%
Thailand	Wethyavivorn & Koo-smith; Lonkani & Tirapat; Ekkayokkaya and Pengniti	459	1987-2007	36.6%
Turkey	Kiymaz; Durukan; Ince; Kucukkocaoglu	315	1990-2008	10.6%
United Kingdom	Dimson; Levis	4,198	1959-2008	16.3%
United States	Ibbotson, Sindelar & Ritter; Ritter	12,028	1960-2008	16.9%

(Source: Ritter et al, "Initial Public Offerings: International Insights", Pacific-Basin Finance Journal Vol. 2, pp. 165-199, Updated July 27, 2009)

In the U.S.A., the average initial return of the investment in IPOs during the period 1960-2008 amounted to 16.9%, in the United Kingdom the respective return for the period 1959-2008 amounted to 16.3%, in Germany the average return for the period 1978-2008 was 25.3%, while in France the return amounted to 10.7% for the period 1983-2006. In Italy, the IPO market presented an average return for the first day of 16.4% for the period 1985-2008, in Spain 10.9% for the period 1986-2006, in Portugal 11.6% for the period 1992-2006, in Sweden 27.3% for the period 1980-2006, in Switzerland 28% for the period 1983-2008, and in Austria 6.5% for the period 1984-2006.

In Canada the initial return of new listings corresponded to 7.1% on average for the period 1971-2006, in Brazil 48.7% for the period 1979-2006, in Mexico 15.9% for the period 1987-1994 and in Chile 8.4% during the period 1982-2006. Also, the average initial return of IPOs in Japan was 40.1% during 1970-2008, in Hong Kong the return corresponded to 15.9% during 1980-2006, in India to 92.7% during 1992-2007, in Iran 22.4% during 1991-2004, in Indonesia 21.5% during 1989-2008, in Korea 55.2% during 1980-2008 and in Malaysia 69.6% during 1980-2006.

Finally, the returns of IPOs were derived also for New Zealand (20.3%), Nigeria (12.7%), Norway (9.6%), Philippines (21.2%), Poland (22.9%), Singapore (27.4%), South Africa (32.7%), Taiwan (37.2%), Thailand (36.6%), Turkey (10.6%), Belgium (13.5%), Cyprus (23.7%), and Sri Lanka (48.9%).

Chapter 5
Long-Run Performance of Greek Initial Public Offerings (IPOs)

5.1 Introduction

In this chapter, the long-run performance of IPOs on the Athens Stock Exchange is examined during the period 1995 – 2007 by calculating and analysing monthly and cumulative returns of the newly listed Greek stocks over that period. The core objective is to test the market adjusted as well as the absolute cumulative returns investors realized by placing their funds into newly listed stocks on the Athens Exchange during the most developed phase in the history of the Greek equity market. The period 1995 – 2007 consists of a bull market phase that ended with the General Index peak in the first half of 1999, when transaction value and investors' interest reached an all time high, of a downward trend during the period 2000 – 2003 and of a market reversal from 2004 up to 2007. In a second stage, an attempt is made to compare the findings from the Greek IPO market with the ones presented in the international literature covering long-run IPO returns in various international markets, placing at the same time a special emphasis on the US market. It is important to note that this research dissertation attempts to assess any potential out performance or under performance of IPOs based on benchmark indices. Thus IPO returns are examined mainly on absolute but also on relative terms.

In order to calculate monthly and cumulative returns of Greek IPOs, the initial trading day closes of the newly listed stocks as the starting basis were utilized, based on the Daily Price Close Bulletin of the Athens Exchange. This approach is also in line with similar ones found in international literature covering long-run IPO returns and is justified on the basis that the broader investment community is not normally in a position to purchase newly listed stocks during initial public offerings due to lack of supply and due to other structural factors of the IPO procedure. The times series of Greek IPOs were also adjusted for any corporate action taking place during the period under consideration, such as share capital increase due to rights issue, stock split, and bonus share issue.

5.2 Data and Methodology

The Athens Exchange saw the listing of 245 new stocks during the period 1995 – 2007 as depicted in table 1. The largest number of new listings occurred in year 2000 with 53 companies floating theirs shares on the domestic equity market. 1999 was the second most active year for Greek IPOs with 37 new listings. For the remaining years of the period we consider, the domestic market experienced lower numbers of new listings: There were 20 listings in years 1995 and 1996, 12 in 1997, 23 in 1998, 21 in 2001 and 2002, 15 in 2003, 11 in 2004, 2 in 2006 and 4 in 2007. It is important to note that IPOs were categorized per year based on the stock's initial trading day and not on the period of the initial public offering. Other research dissertations in the international literature may classify IPOs on the basis of the offering period.

TABLE 1: Frequency of IPOs by Year

Year	Number of IPOs	Year	Number of IPOs
1995	20	**2002**	21
1996	20	**2003**	15
1997	12	**2004**	11
1998	23	**2005**	6
1999	37	**2006**	2
2000	53	**2007**	4
2001	21	**Total**	**245**

Note: IPOs are categorized per year based on the stock's initial trading day.
Source: Athens Exchange – www.ase.gr

In the context of this research dissertation, the period 1995 – 2007 was divided into 3 sub-periods: 1995 – 1999, 2000 – 2003 and 2004 – 2007. That approach was deemed necessary due to the following factors: (a) Each sub-period possesses different characteristics with regard to the dynamics and outlook of the Greek equity market. We present and in part discuss those characteristics in the following section of this chapter. (b) It is likely that long-run IPO returns are affected by each equity cycle's specific driving factors. For example, it might be the case that rising equity prices are an additional facilitator factor enhancing long-run IPO return during a specific time period. According to J. R. Ritter, equity market cycles were determinant factors of US IPO long-run returns during the period 1980 – 2006 as implied in the data of average 3-year returns in a following table (Section 5.4).

Therefore, it is likely the utilization of the 3 sub-periods to shed further light to whether the potential under pricing phenomenon of IPOs that is frequently discussed and challenged in the international literature is also a case in the

Greek equity market. More importantly, it is critical to observe any possible qualitative relation between under pricing of IPOs and the domestic market's conditions prevailing in different equity cycles.

The following figure presents the closing prices of Athens Exchange's General Index during the period under consideration. By this chart, the three sub-periods, denoted with vertical lines, that the domestic equity market experienced during the longer period 1995 – 2007 become clear implying different valuation cycles and investor expectations.

FIGURE 1: General Index of Athens Exchange, Period 2/1/1995 – 2/1/2008

Source: Athens Exchange data.

More specifically, the Athens General Index reached its peak during the year 1999, completing a typical bubble phase in September of that year. It is not irrelevant to note that 1999 was a period of massive engagement of local retail investors with Greek stocks, exacerbating the favourable however fragile market psychology. After the fall of that year, the Greek equity market entered into a violent downward trend as a result of the excessive and unjustified valuations realized previously (price earnings ratios greater than 50 times was a common characteristic among the majority of Greek stocks at the time) and due to the broader negative international equity market outlook, which lasted until the year 2003. Following that year, Greek reverse their trend from the especially low levels of the previous year entering in an upward course up to the year 2007, when the international credit crisis begun to show its momentum.

Therefore the long-run performance of Greek IPOs is examined in three sub-periods in two of which the Athens General Index exhibited positive return, and in one it demonstrated negative return. A researcher would normally expect the overall equity market conditions prevailing in each time period to have a critical effect on the performance of the newly listed stocks. It is clear though that the Greek equity market outlook and the overall investor sentiment as reflected in the annual return of the General Index has played a determinant role in the number of IPOs taking place each year during the period under consideration. Up to the 1999, which is the year of the equity market peak, and especially during the year 2000, which is a year of falling stock prices however with an unabated participation on behalf of investors – local investors continued to place significant funds in the market during the first half not expecting that the downfall would last– the number of IPOs remained notably higher as compared to the following years, period 2001-2007, when the market entered into mixed phase with a downward trend until the 1st half of 2003 and an upward trend until most of 2007.

Based on historic and practical evidence, a company's decision to float its shares depends mostly on its own as well as the underwriter's view about the conditions and the equity price trend prevailing each time in the market. In periods of favourable macroeconomic and microeconomic conditions and rising equity prices, companies and underwriters alike are in favour of IPOs. In periods of falling or distressed equity markets, companies and underwriters appear more risk averse. Therefore they usually do not wish to go for an IPO which might not be successful during the offering period as well as after the stock's listing on the exchange.

In order to put the long-run performance of Greek IPOs in quantitative terms, the following metric of return was calculated for each new listing:

Long-Run Returns: The long aftermarket return assesses stock performance during 36 calendar months following the first month of trading. According to J. R. Ritter (1991), the initial return period is defined to be month 0, with the long-term aftermarket period including 36 months, where months are defined as successive 21-day trading periods relative to initial public offering date. Accordingly, month one consists of event day 2-22, month 2 consists of event day 23-43 etc. For IPOs in which the initial return period is greater than 1 day, the month 1 period is truncated accordingly, e.g., if the initial return period is 3 days, month 1 consists of event days 4-22.

The total return for stock i in the period t is calculated as in Equation (1) where P_{it} is the price of stock i at time t and P_{it-1} is the price of stock i at time t-1.

$$\text{Equation (1)}: \quad R_{it} = P_{it}/P_{it-1} - 1 \quad (1)$$

Data Collection & Process: In this research report, the empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns.

At a first stage, the daily, adjusted for any historic corporate actions, share price closes were collected from the Athens Exchange for all companies that listed their shares during the three sub-periods, 1995-1999, 2000-2003 and 2004-2007.

For each sub-period, the monthly return was calculated for a period of 36 months on monthly and cumulative basis. For example, for month 2, the absolute return of the second listing month was calculated (return between the share price closes of the last and first trading day of the month) for all stocks of the particular sub-period and the average return was extracted. For a stock listed at the last month of a sub-period, no absolute return for month 2 was calculated. Likewise, for month 2, the cumulative return of the first 2 listing months was calculated for all stocks of the particular sub-period. With regard to the cumulative return of the above example, the following equation was used:

(Share price close at the end of the 2nd listing month – share price close of the first trading day) / (share price close of the first trading day)

This was applied for each stock listed in the particular sub-period, and the average cumulative return was then extracted for month 2.

The above process was followed for the sub-periods 1995-1999, 2000-2003 and 2004-2007, producing the results of tables 2, 3 and 4. The last column of the table refers to the number of new listings utilized for calculating the monthly and cumulative return for each month. The number follows a downward pattern due to the fact that several companies merged with one another during the period under consideration.

Finally it is noted that all returns calculated are net of dividends, since in the case of the Greek stock market dividend yields in the majority of companies were especially low.

Finally, the above data were also utilized to calculate the market adjusted return of Greek IPOs based on the General Index of the Athens Exchange. In this context, new listings that took place in each sub-period were examined. Market adjusted return for the first “n” months is the difference between the General Index cumulative return for the first “n” months and the cumulative IPO return for the first “n” months. The cumulative IPO return for the first “n” months is the average return of the “n”-month cumulative returns of IPOs during each sub-period. The above process produced the outcome of the tables 5, 6 and 7.

5.3 Empirical Results and Comparison with the International Market

Tables 2, 3 and 4 present the average cumulative returns of the Greek IPOs up to the 36th month from each stock's initial listing for the three sub-periods under consideration: 1995 – 1999, 2000 – 2003 and 2004 – 2007. The following initial observations can be derived from the tables below: (a) The period 1995 – 1999 is characterized by positive average cumulative returns with an accelerating pattern; (b) The period 2000 – 2003 is characterized by exactly the opposite picture. Most returns turn negative with an accelerating pace; (c) Finally, the period 2004 – 2007 is characterized by improved and positive cumulative returns. Analysis of the results is presented in a following section of this research report.

TABLE 2: Monthly and Cumulative Returns of Greek IPOs (for 36 Months) during the period 1995 - 1999

[We examine new listings that took place during the period 1995 – 1999 and we calculate their returns for the full 36-month period or the remaining period. For example, for a new listing taking place in November 1999, we calculate its monthly and cumulative return for only 1 month.]

	Period 1995 - 1999		
MONTH	**MONTHLY RETURN**	**CUMULATIVE RETURN**	**NUMBER of IPOs**
1	11.88%	11.88%	106
2	5.13%	16.95%	106
3	6.63%	28.80%	106
4	4.66%	38.68%	106
5	5.65%	48.03%	106
6	4.42%	50.79%	106
7	0.34%	52.94%	106
8	2.63%	65.91%	106
9	6.94%	82.39%	106
10	2.00%	96.89%	106
11	3.77%	105.15%	106
12	-0.68%	101.24%	106
13	2.26%	111.72%	106
14	1.16%	111.50%	106
15	2.70%	111.62%	106
16	-1.96%	103.81%	106
17	2.07%	116.94%	106
18	2.66%	125.55%	105
19	-0.28%	129.93%	105
20	1.29%	134.96%	105
21	0.31%	146.32%	104
22	1.04%	152.96%	104
23	5.86%	156.14%	104
24	1.92%	154.93%	104
25	0.50%	148.91%	103
26	4.53%	165.97%	102
27	-2.69%	162.25%	102
28	3.62%	183.54%	102
29	1.13%	361.06%	102
30	-1.46%	193.47%	101
31	3.34%	219.71%	101
32	6.01%	266.27%	101
33	-1.53%	278.88%	101
34	4.01%	268.48%	101
35	6.12%	287.25%	101
36	-0.79%	279.78%	101

Source: Athens Exchange share price data.
Explanatory note: The empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns

TABLE 3: Monthly and Cumulative Returns of Greek IPOs (for 36 Months) during the period 2000 - 2003

[We examine new listings that took place during the period 2000 - 2003 and we calculate their returns for the full 36-month period or the remaining period. For example, for a new listing taking place in November 2003, we calculate its monthly and cumulative return for only 1 month.]

	Period 2000 - 2003		
MONTH	**MONTHLY RETURN**	**CUMULATIVE RETURN**	**NUMBER of IPOs**
1	1.70%	1.70%	110
2	-0.76%	0.84%	110
3	-0.20%	1.67%	110
4	0.74%	2.89%	110
5	-2.84%	1.34%	110
6	-4.16%	-3.09%	110
7	2.32%	-3.43%	110
8	-2.49%	-5.00%	110
9	-2.39%	-6.92%	110
10	-0.11%	-6.55%	110
11	-1.51%	-9.24%	110
12	1.48%	-10.97%	110
13	-1.68%	-12.28%	110
14	-2.77%	-16.81%	109
15	-1.49%	-18.13%	108
16	0.48%	-18.34%	108
17	-3.81%	-22.20%	108
18	-0.44%	-22.87%	108
19	1.62%	-22.38%	108
20	-3.42%	-25.69%	108
21	-1.62%	-27.40%	108
22	-0.98%	-27.14%	108
23	-2.29%	-30.38%	108
24	-0.99%	-31.00%	108
25	-2.01%	-32.17%	108
26	-3.22%	-33.87%	107
27	-0.93%	-33.75%	107
28	-0.61%	-33.87%	107
29	-4.42%	-35.67%	107
30	1.12%	-35.55%	106
31	-1.05%	-35.75%	104
32	0.28%	-38.61%	103
33	1.06%	-36.22%	102
34	0.81%	-36.88%	100
35	1.44%	-34.76%	99
36	4.23%	-34.01%	99

Source: Athens Exchange share price data.
Explanatory note: The empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns

TABLE 4: Monthly and Cumulative Returns of Greek IPOs (for 36 Months) during the period 2004 - 2007

[We examine new listings that took place during the period 2004 - 2007 and we calculate their returns for the full 36-month period or the remaining period. For example, for a new listing taking place in November 2007, we calculate its monthly and cumulative return for only 1 month.]

	Period 2004 - 2007		
MONTH	**MONTHLY RETURN**	**CUMULATIVE RETURN**	**NUMBER of IPOs**
1	-7.34%	-7.34%	23
2	-0.06%	-8.26%	22
3	-2.03%	-10.22%	22
4	-1.07%	-10.36%	22
5	1.04%	-9.72%	22
6	4.07%	-4.95%	21
7	4.95%	-0.69%	21
8	0.46%	-0.43%	21
9	3.99%	3.43%	20
10	-1.39%	1.67%	20
11	-3.36%	-1.97%	20
12	0.96%	-1.96%	19
13	-1.63%	-2.62%	19
14	-2.50%	-4.63%	19
15	0.19%	-3.85%	19
16	-1.20%	-2.95%	19
17	1.33%	-3.96%	19
18	-0.40%	-4.03%	19
19	3.24%	-4.64%	17
20	5.02%	-2.00%	17
21	-1.77%	-1.16%	16
22	11.80%	10.43%	15
23	14.84%	25.52%	15
24	2.42%	30.50%	15
25	0.83%	28.25%	14
26	0.43%	32.51%	14
27	-1.95%	35.19%	14
28	2.59%	33.74%	14
29	-1.87%	31.67%	14
30	4.64%	36.69%	11
31	0.63%	35.53%	11
32	3.53%	37.77%	10
33	-3.45%	34.60%	10
34	10.87%	28.88%	10
35	9.92%	34.93%	10
36	1.33%	36.18%	10

Source: Athens Exchange share price data.
Explanatory note: The empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns

On qualitative terms, the empirical results of the Greek IPOs during the three sub-periods can be discussed as follows:

The sub-period 1995 – 1999 [7] experienced positive returns for the Greek IPOs. All monthly and cumulative returns calculated are based on a number of IPOs that exceeds 100. On monthly basis, there were only 7 occasions out of 36 in total, when IPO returns turned negative however along a very low and narrow range, between -0.2% and -2.80%. Average cumulative returns appeared strongly positive and accelerated, starting with 11.88% in the 1-month period and ending with 280% in the 36-month period, while the peak level was observed in the 29-month period with 361%.

The above empirical results of the period 1995 – 1999 were also due to a series of critical factors. The favourable macroeconomic conditions prevailing in Greece at that time, consisting of strong fiscal discipline, privatisations and domestic currency depreciation along the country's final route to EMU accession and adoption of the Euro.

Rising equity prices as investor expectations about the country's successful entry in EMU reflected into rising valuations in the stock market via an accelerating pattern.

Domestic currency's devaluation was an additional factor enhancing returns as the cheaper domestic assets started to appear very to attractive to foreign investors. The latter ones invested massive amounts of capital in Greek equities creating an unprecedented upward trend in the domestic market especially in 1998, the year of devaluation.

Pricing of IPOs proved to be competitive as well as attractive since both companies – candidates for listing and underwriters did not anticipate the height of the market bubble in 1999. Therefore returns of new listings turned 2-fold or 3-fold in less than 36 months.

The great majority of new listings concerned small sized firms, which experienced significantly greater demand from investors than the available offering at the time, thus realizing strong returns in the period after the listing. The factor of firm size in IPO returns is important as it is also documented in several findings of the international literature. For example, an empirical study on IPOs in India by Jyoti Gupta and Taufique Samdani, 2008, supported the hypothesis that stocks with a high degree of uncertainty, such as small-cap and mid-cap companies, were subject to stronger investor sentiment than large-cap companies, a fact that was also implied in IPO returns.

[7] Prior to 1995, there are two studies for the Greek IPOs. Kazantzis and Thomas examined IPOs for the period 1987-1994. Their findings indicated an average initial return of 50.89% and an adjusted (for market changes) return of 51.73%. Also, Kollintzas, Sfakianakis and Tyligada jointly examined the new share listings during the period 1972-1994 and found an average initial return of 26.3%.

The above IPO returns were mainly determined by the positive equity market cycle of that period. This is in line with the study of Lazaridis, Livanis & Kolyvopoulos analysing IPOs for the period 1995-1999. According to their results, IPOs during the period were under priced by 113.63% on average. On the contrary, during the period even after the first three years following their initial listing on the stock market, the average return was 40.22%.

The sub-period 2000 – 2003 demonstrated low positive and mostly negative returns for Greek IPOs. All returns calculated in the sample were based on a number of IPOs within a range of 90 - 110. On monthly basis, there were 24 occasions out of 36 in total, when IPO returns turned negative however along a very low and narrow range, between -0.2% and -4.50%. Average cumulative returns appeared negative and escalated, starting with -6% in the 6-month period and ending with 34% in the 36-month period, while the highest negative cumulative return was observed in the 32-month period with 38.61%.

The above empirical results of the period 2000 - 2003 were also due to a series of critical factors. The bubble in equity prices up to 1999 in Greece and until the first months of 2000 in the developed markets led to a violent "disintegration" of equity valuations that in turn affected IPO returns as well.

Due to the fact that Greece practically behaved as an emerging market, although typically a developed one, due to its narrow depth of transaction volume, the phenomenon of negative returns aggravated.

On the other hand, the cumulative negative return of 34% in the 36-month period as compared with the exceptional cumulative return realized in the previous sub-period, did not fully diminish the view that investors may realize satisfactory returns from IPOs over the long-run.

The effect from equity bubble burst on IPO performance is quite common and definitely independent of geographic market. For example in 2008 the Chinese market experienced similar conditions. "….[8] When stocks in three big Chinese companies sank below their IPO prices, investors who had bought shares in previous year's offers suffered. China's once-roaring IPO market was another casualty. After the spectacular growth during the previous year, when mainland China eclipsed the United States as the world's biggest market for initial public offers of equity, sliding stock prices and concern about oversupply threatened to stifle activity in 2008. The bubble was bursting after rampant speculation pushed prices of newly listed shares to ridiculously high levels at the peak of China's stock bull run late the previous year. That was expected to slow equity fund-raising in coming months and deter the overpricing of new offers and new listings. Investors bought a staggering $100 billion of equity in almost 200 newly listing firms between May 2006, when China lifted a year-long ban on IPOs, and February 2008. The IPO flood had previously seen many deals massively oversubscribed by frenzied investors"

[8] Lu Jianxin (2008) Analysis on Chinese IPO price sinking (Article)

The sub-period 2004 – 2007 was characterized by a mixed picture for Greek IPOs with a "tendency" towards positive monthly returns as well as positive cumulative returns for periods greater than 21 months. During that period, all returns calculated were based on a limited number of IPOs, within a range of 10 – 25 new listings. The small number of new listings during that sub-period was due to the continued "shock" side effects that hit private investors followed the sharp correction of small to medium cap stocks that continued beyond the year 2003 (it was the year when the Athens General Index marked its low before bouncing up for the period 2004 – 2007). Since investors' losses were huge in the small to medium cap category stocks, and since most new listings were traditionally small to medium cap stocks, it was a natural result that investors' interest on IPOs was damaged more than expected. A second parallel factor was the tighter stance of the Hellenic Capital Market Committee on approving new listings, since the authorities adopted a more cautious approach on which companies were to be listed in their efforts to protect investors' interests following the sharp equity price correction of the previous period.. On monthly basis, there were 22 occasions out of 36 in total, when IPO returns turned positive exceeding in three months (22^{nd}, 23^{rd} and 34^{th}) the level of 10%. Monthly returns higher than 10% were not apparent even in the more favourable IPO period of 1995 – 1999. The fact that domestic equity market reversed its trend from the especially low levels in 2003 leading to a more "violent" positive reaction of stock prices could also explain the realization of monthly returns higher than 10% in three occasions.

Average cumulative returns appeared mostly negative and decelerating up to the 21-month period (ranging between -10.22% and 3.43%), and afterwards continued positive via an accelerated pattern, reflecting partly the strengthening upward cycle of equity valuations during the sub-period under consideration. The 22-month period saw the lowest cumulative return with 10.43% and the 32-month period the highest one with 37.77%. The cumulative return in the 36-month period settled at 36.18%.

The above empirical results of the period 2004 - 2007 may be attributed to a number of factors. The rising equity valuation cycle fully realized during that sub-period following the reversal of the market sentiment.

Despite the reserved market sentiment, the number of IPOs offered during that sub-period was limited, as the market did not fully recovered from the negative psychology of the previous sub-period. The reserved market conditions in turn "motivated" only companies with strong financial health and prospects to attempt their listing on the exchange. Therefore, the "more selected" group of new listings implied better candidates that performed positive in the long run.

Macroeconomic conditions also improved during the sub-period under consideration with the country adopting a tighter fiscal policy management.

In terms of initial returns of Greek IPOs, the results documented in academic literature are more favourable than the ones analysed above. Livanis *et al* (2005) studied the return during the initial 3 trading days of newly listed shares in two sub-periods (from 1995 to 1999 – a boom period for the Greek stock market – and from 2000 until 2003 – a downside period for the General Index and a period characterized by lack of trust in the stock market from a significant portion of investors) in order to derive the most representative results as possible. The results indicated an average initial return of 106.8% for the period 1995-1999 and an average initial return of 39% for the period 2000-2003.

Empirical evidence accumulated over the past 40 years for almost any capital market in the world has documented that initial public offerings (IPOs) provide significant positive abnormal returns on their first day of trading, however in the very long-run (periods more than 3 years) they are characterized by poor stock performance. In the first 3-year period, returns are positive in most cases, however when these are compared to a benchmark index there are many cases of underperformance.

Based on a research dissertation by T. Loughran, J. R. Ritter and K. Rydqvist (1994), the average initial returns for 25 countries during a period from mid 1970s up to early 1990s, turned out to be all positive. As an indication, developed markets such as the US and UK demonstrated returns of 15.3% and 12.0% respectively, whereas emerging markets such as Malaysia and Portugal posted returns of 80.3% and 54.4% respectively. The above abnormal returns were mainly based on the following explanation: IPOs are deliberately under priced at the initial offering as an effort on behalf of the issuer and the underwriter to ensure the successful placement and justify the attractiveness of the offering price through the realization of an abnormal return in the first days of trading.

However in the long run, IPOs are characterized by a more modest performance. According to Ritter (1991), the average holding return for a sample of 1,526 IPOs of common stock in the period 1975 - 1984 settled at 34.47% in the three years after going public. [This holding period return is measure from the closing market price of the first day of public trading to the market price on the 3 year anniversary.]. According to a more recent research dissertation by J. R. Ritter examining new listings during the period 1980 – 2006, the positive average 3-year buy-and-hold returns of US IPOs were also verified.

The following two tables compiled by J. R. Ritter exhibit initial and long-run returns, as well as market adjusted returns of US IPOs during the period 1980 – 2006. In accordance with this research dissertation's objective and in order to compare the long-run returns of Greek IPOs with similar or relative data from the international and particularly the US market, an emphasis is placed on the average 3-year buy-and-hold return of IPOs. The other set of data presented in the following table, which are the market-adjusted returns, are

also discussed in relevance with the corresponding findings from the Greek IPOs.

TABLE 5: Initial & Long-Run Returns of IPOs Categorized by the Pre-Issue Sales of the Firm

Sales	Number of IPOs	Average First-day Return	Average 3-year Buy-and-hold Return		
			IPOs	Market-adjusted	Style-adjusted
0-9.999 mm	1,504	25.2%	-12.3%	-49.5%	-30.8%
10-19.999 mm	762	26.0%	6.0%	-36.2%	-17.1%
20-49.999 mm	1,508	20.8%	23.3%	-21.6%	-2.7%
50-99.999 mm	1,111	15.0%	39.6%	-5.1%	3.2%
100-499.999 mm	1,570	10.7%	41.6%	-2.6%	8.1%
500 mm and up	616	9.0%	37.7%	1.2%	1.7%
0-49.999 mm	3,774	23.6%	5.6%	-35.7%	-16.4%
50 mm and up	3,297	11.8%	40.2%	-2.7%	5.2%
1980-2006	7,071	18.1%	21.8%	-20.3%	-6.3%

Note: Sales expressed in US dollars. Source: J. R. Ritter.

TABLE 6: Initial & Long-Run Returns of US IPOs per Year
Period 1980 - 2005

	Number of IPOs		Average	Average 3-year
Year	Market	Style	First-day Return	IPOs
1980	73	70	13.9%	87.3%
1981	196	189	6.2%	12.2%
1982	80	75	10.5%	38.4%
1983	451	445	9.9%	16.0%
1984	178	171	3.2%	46.6%
1985	185	183	6.2%	6.0%
1986	397	396	6.1%	17.6%
1987	290	290	5.5%	-1.8%
1988	102	101	5.7%	58.5%
1989	110	109	8.3%	50.1%
1990	110	108	10.8%	9.7%
1991	280	280	11.8%	30.9%
1992	397	396	10.2%	38.8%
1993	489	488	12.8%	44.6%
1994	405	390	9.8%	74.0%
1995	458	455	21.2%	28.4%
1996	675	670	17.2%	25.2%
1997	473	471	14.1%	58.3%
1998	283	282	21.7%	23.5%
1999	468	463	70.8%	-45.5%
2000	374	371	55.7%	-59.0%
2001	80	79	14.0%	16.5%
2002	66	66	9.1%	68.5%
2003	63	62	12.2%	35.9%
2004	173	173	12.2%	51.8%
2005	161	160	10.2%	40.0%
1980-1989	2,062	2,029	7.2%	22.5%
1990-1994	1,681	1,662	11.2%	45.7%
1995-1998	1,889	1,878	18.0%	34.0%
1999-2000	842	834	64.1%	-51.5%
2001-2005	543	540	11.5%	43.3%
1980-2005	7,017	6,943	18.2%	23.9%

Source: J. R. Ritter.

The sample size was 7,071 firms that listed their shares during the period 1980 – 2006. The 3-year average return settled at the satisfactory level of 21.8%, however lower than the average long-run returns of previous periods examined in older research dissertations. This may be due to the fact that the period 1980 - 2006 included the sub-period of 2000 – 2006 when the equity market experienced turbulence with high volatility and weakening valuations. All average long-run returns of IPOs categorized by pre-issue sales appear positive starting from a low of 6.0% in the case of USD 10-19.99 million pre-issue sale and reaching a high of 41.6% in the case of USD 100-499.99 million pre-issue sale. The only exception is the category of USD 0-9.99 million pre-issue sale which posted a negative long-run return of 12.3% [Table 5].

Equity market cycles were determinant factors of US IPO long-run returns as implied in the data of average 3-year returns in Table 11. Furthermore the period 1980 – 2006 saw information flows considerably increasing with the time, assisted by the adoption of more transparent regulation frameworks as compared to the past and the utilization of new technologies in the international equity markets speeding up transmission as well as dissemination of information. Miller in 1977 suggested that the marginal, most optimistic investor sets share prices. As information flows increase with time, the divergence of expectations decreases and thus the prices are adjusted downwards, i.e. long-run performance is negatively related to the extent of divergence of opinion. It is difficult to test this hypo dissertation because it is difficult to measure the divergence of opinion. However, the Table 6 reveals that a deceleration in IPO long-run returns as information flows increase with time might be the case, for example looking at cumulative returns in periods 1999 – 2000 and 2001 – 2005 as compared to the returns realized in the previous periods, 1990 – 1994 and 1995 – 1998.

It is interesting to note that the above presented findings point to potential greater long-run returns for larger size IPOs versus lower long-run returns in the case of smaller size IPOs. Large size corporations with an interest to float their shares on the stock market are well suited to attract investors' interest as opposed to smaller firms for a number of reasons: (a) They are more established and trusted companies within the investment community; (b) They can more easily persuade institutional and retail investors about their future prospects; (c) Their stock's transaction market is deeper thus once greater valuations are captured, it is more difficult for the market to reverse their trend.

Similar conclusions of positive IPO returns can be drawn from the Chinese IPO market. In a dissertation published in 2002 by Jing Chi and Carol Padgett, the short-run and long-run performance of Chinese privatisation initial public offerings (PIPOs) was studied, using data for 340 and 409 new issues on the Shanghai and Shenzhen Stock Exchanges respectively, from 1 January 1996 through 31 December 1997. The average market-adjusted

initial return was found to be 127.31%, and the initial returns on both stock exchanges were not significantly different from each other. The average market-adjusted buy and hold return over the three years after listing was 10.26%. Furthermore, a cross-sectional analysis was used to explain the long-run supernormal performance of Chinese IPOs. It was found that government ownership, the offering size, and the feature of belonging to a high-tech industry were the main determinants of the long-run performance.

In the case of the European IPO market, the evidence on long-term performance remains sparse according to several researchers. On the other hand, some of the findings presented during the last two decades appear to be contradictory. According to a dissertation titled “The Post-Issue Performance Imperative” by Benoit F. Leleux and Daniel F. Muzyka, the average performance since flotation for the 19 companies listed on the Nouveau Marche in Paris as of February 1997 stood at -8%, with a majority of the firms trading at a discount to their issue price. T. Keloharju (1993), Hansson and Ljungqvist (1993), Levis (1993), in various European settings, highlighted the poor performance of IPO stocks in secondary trading, results contradicted by the findings of Rydqvist (1993) and Kunz and Aggarwal (1991) in Sweden and Switzerland respectively.

The following tables present the market adjusted return of Greek IPOs for the three sub-periods, 1995-1999, 2000-2003 and 2004-2007. As discussed earlier, market adjusted return for the first “n” months is the difference between the General Index cumulative return for the first “n” months and the cumulative IPO return for the first “n” months, where the cumulative IPO return for the first “n” months is the average return of the “n”-month cumulative returns of IPOs during each sub-period. At a first glance, market adjusted returns turned positive in the sub-periods 1995-1999 and 2000-2003, whereas they moved to a negative territory in the last sub-period 2004-2007.

TABLE 7: Market Adjusted Returns of Greek IPOs (for 36 Months) Period 1995 - 1999

[New listings that took place during the period 1995 – 1999 were examined. Market adjusted return is the difference between the Athens Exchange General Index cumulative return and the IPO cumulative return. As an explanatory example, the cumulative IPO return for the 5th month is the average return of the 5-month cumulative returns of IPOs during the above period.]

Period 1995 - 1999			
MONTH	**CUMULATIVE GENERAL INDEX RETURN**	**CUMULATIVE IPO RETURN**	**MARKET ADJUSTED RETURN**
1	-8.38%	11.88%	20.26%
2	-7.49%	16.95%	24.44%
3	-7.09%	28.80%	35.89%
4	5.78%	38.68%	32.90%
5	0.78%	48.03%	47.25%
6	5.62%	50.79%	45.17%
7	10.63%	52.94%	42.31%
8	7.42%	65.91%	58.48%
9	3.86%	82.39%	78.53%
10	2.35%	96.89%	94.54%
11	2.65%	105.15%	102.50%
12	3.76%	101.24%	97.48%
13	10.91%	111.72%	100.81%
14	12.69%	111.50%	98.81%
15	6.97%	111.62%	104.65%
16	4.49%	103.81%	99.31%
17	3.80%	116.94%	113.13%
18	2.73%	125.55%	122.83%
19	-1.03%	129.93%	130.96%
20	5.91%	134.96%	129.05%
21	8.68%	146.32%	137.64%
22	3.60%	152.96%	149.36%
23	1.93%	156.14%	154.21%
24	17.76%	154.93%	137.17%
25	41.32%	148.91%	107.60%
26	43.10%	165.97%	122.88%
27	57.40%	162.25%	104.85%
28	88.47%	183.54%	95.07%
29	0.20%	361.06%	360.86%
30	73.44%	193.47%	120.02%
31	82.01%	219.71%	137.70%
32	90.88%	266.27%	175.39%
33	100.95%	278.88%	177.93%
34	50.19%	268.48%	218.28%
35	70.97%	287.25%	216.27%
36	62.50%	279.78%	217.27%

Source: Athens Exchange share price data.
Explanatory note: The empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns

TABLE 8: Market Adjusted Returns of Greek IPOs (for 36 Months) Period 2000 - 2003

[New listings that took place during the period 2000 - 2003 were examined. Market adjusted return is the difference between the General Index cumulative return and the IPO cumulative return. As an explanatory example, the cumulative IPO return for the 5th month is the average return of the 5-month cumulative returns of IPOs during the above period.]

Period 2000 - 2003			
MONTH	**CUMULATIVE GENERAL INDEX RETURN**	**CUMULATIVE IPO RETURN**	**MARKET ADJUSTED RETURN**
1	0.18%	1.70%	1.52%
2	-5.01%	0.84%	5.85%
3	-10.36%	1.67%	12.03%
4	-16.66%	2.89%	19.54%
5	-16.83%	1.34%	18.17%
6	-26.08%	-3.09%	22.99%
7	-27.98%	-3.43%	24.55%
8	-28.49%	-5.00%	23.49%
9	-25.30%	-6.92%	18.38%
10	-28.93%	-6.55%	22.38%
11	-36.62%	-9.24%	27.38%
12	-40.07%	-10.97%	29.09%
13	-42.30%	-12.28%	30.02%
14	-40.88%	-16.81%	24.07%
15	-43.02%	-18.13%	24.88%
16	-42.02%	-18.34%	23.68%
17	-44.85%	-22.20%	22.66%
18	-52.60%	-22.87%	29.73%
19	-50.28%	-22.38%	27.90%
20	-50.28%	-25.69%	24.59%
21	-58.10%	-27.40%	30.70%
22	-51.76%	-27.14%	24.62%
23	-50.04%	-30.38%	19.66%
24	-51.55%	-31.00%	20.55%
25	-52.47%	-32.17%	20.30%
26	-54.70%	-33.87%	20.83%
27	-58.94%	-33.75%	25.19%
28	-56.21%	-33.87%	22.34%
29	0.01%	-35.67%	-35.68%
30	-60.44%	-35.55%	24.89%
31	-59.98%	-35.75%	24.24%
32	-63.37%	-38.61%	24.76%
33	-66.37%	-36.22%	30.14%
34	-66.46%	-36.88%	29.58%
35	-65.95%	-34.76%	31.19%
36	-67.84%	-34.01%	33.83%

Source: Athens Exchange share price data.
Explanatory note: The empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns

TABLE 9: Market Adjusted Returns of Greek IPOs (for 36 Months) Period 2004 - 2007

[New listings that took place during the period 2004 - 2007 were examined. Market adjusted return is the difference between the General Index cumulative return and the IPO cumulative return. As an explanatory example, the cumulative IPO return for the 5th month is the average return of the 5-month cumulative returns of IPOs during the above period.]

Period 2004 - 2007			
MONTH	**CUMULATIVE GENERAL INDEX RETURN**	**CUMULATIVE IPO RETURN**	**MARKET ADJUSTED RETURN**
1	2.58%	-7.34%	-9.92%
2	4.71%	-8.26%	-12.97%
3	1.18%	-10.22%	-11.40%
4	1.24%	-10.36%	-11.60%
5	0.63%	-9.72%	-10.36%
6	-2.73%	-4.95%	-2.22%
7	-4.20%	-0.69%	3.51%
8	-2.34%	-0.43%	1.91%
9	-0.63%	3.43%	4.06%
10	10.22%	1.67%	-8.55%
11	11.38%	-1.97%	-13.35%
12	18.65%	-1.96%	-20.61%
13	21.22%	-2.62%	-23.83%
14	29.88%	-4.63%	-34.51%
15	25.12%	-3.85%	-28.97%
16	19.56%	-2.95%	-22.51%
17	27.98%	-3.96%	-31.94%
18	29.58%	-4.03%	-33.60%
19	38.44%	-4.64%	-43.08%
20	37.88%	-2.00%	-39.88%
21	41.33%	-1.16%	-42.49%
22	41.82%	10.43%	-31.39%
23	46.90%	25.52%	-21.38%
24	62.47%	30.50%	-31.97%
25	73.48%	28.25%	-45.24%
26	69.26%	32.51%	-36.74%
27	75.16%	35.19%	-39.97%
28	62.20%	33.74%	-28.46%
29	0.06%	31.67%	31.61%
30	48.41%	36.69%	-11.72%
31	64.90%	35.53%	-29.37%
32	62.41%	37.77%	-24.64%
33	68.86%	34.60%	-34.27%
34	80.92%	28.88%	-52.04%
35	80.92%	34.93%	-45.99%
36	93.01%	36.18%	-56.83%

Source: Athens Exchange share price data.
Explanatory note: The empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns

The calculation of market adjusted returns during the three sub-periods, 1995-1999, 2000 – 2003 and 2004 – 2007, reveals similar patterns in the extracted data with the ones observed in the case of absolute monthly and cumulative returns which were previously discussed.

The first sub-period, 1995 – 1999, was characterized by strong and positive market adjusted returns for the newly listed Greek stocks. Those returns evolved through an accelerating pattern. Market adjusted returns ranged from a low of 20.26% for month 1 to a high of 360.86% for month 29. [The IPO returns appear very high and very low in months 28-30 since they refer to the very volatile period March - June 1997, when the Greek equity market experienced a small bubble in prices that made Hellenic Capital Market authorities to intervene by warning investors and stating that prices were too high.] Market adjusted returns remained very strong, above the 100% threshold, for several months, as the domestic bull market that prevailed during that period had a favourable effect on the valuations of the newly listed stocks. The market appeared to "treat" favourably the newly listed stocks as the broader positive investor sentiment encouraged the belief that newly listed companies had strong prospects. Thus valuations of newly listed stocks continued to rise throughout the sub-period 1995 – 1999.

The second sub-period, 2000 – 2003, was characterized by moderate positive market adjusted returns for the newly listed Greek stocks. Most returns ranged between 15% - 35%, with the lowest market adjusted return at -35.68% for month 29 (the only negative market adjusted return of that sub-period) and the highest at 33.83% for month 36. Despite the broader market downturn that prevailed during that sub-period, newly listed stocks appeared to follow a more defensive behaviour compared to the General Index. It is not unusual for an investor to assume that a newly listed stock implies a company which enters the equity market in its most promising growth stage. Thus, its fundamental performance may function as a cushioning factor against a broader market turmoil or downturn such as the one experienced at that time. On the other hand, it is not clear whether the relative "enduring" performance of newly listed stocks, as compared to the performance of the General Index, was mostly due to investor expectations about the fundamental prospects of those companies or due to an "instinctive" continuation of the trading pattern following the especially successful returns of IPOs in the previous sub-period.

The third sub-period, 2004 – 2007, was characterized by negative market adjusted returns that accelerated as the time horizon expanded. Only in four cases (7-, 8-, 9- and 29-month period) market adjusted returns turned out positive. The negative market adjusted returns ranged from a low of -2.22% for the 6-month period to a high of -56.83% for the 36-month period. Although the Greek equity market traded on an upward pattern during the sub-period 2004 – 2007, investors apparently did not appreciate the prospects of the newly listed stocks as they had done in the previous 2 sub-periods. As mentioned earlier, the number of newly listed stocks was much lower than the

previous sub-periods, thus implying that investors' option to place their funds on IPOs was limited. The negative market adjusted returns during 2004 – 2007 signalled that investors considered IPOs as non-attractive any longer, following the extended period, from 1995 up to 2003, when IPOs posted strong and positive market adjusted returns.

Similar conclusions with regard to market adjusted IPO returns can be drawn when examining several international markets in different periods. Market adjusted returns vary across markets and periods as they are very dependent on market cycles and market's trading depth. In dissertation published by T. Loughran in 1994, the above statement becomes evident in markets such as US, UK, Germany, Australia, Brazil and Hong Kong.

Table 10 presents the IPO long-run performance based on market adjusted returns for a variety of markets over different time periods. In most cases, it becomes evident that market adjusted returns turn out negative in contemporary as well as older periods. In Germany the market adjusted return settled at -12.1% during the period 1970 – 1990, in Australia at -51% during 1976 – 1989, in US at -25.1%, - 33.3% and -30% during the periods 1949 – 1955, 1967 – 1987 and 1970 – 1990 respectively, and in Japan at -27% over the period 1971 – 1990. The negative market adjusted returns may be due to the unfavourable equity market cycles and also due to investors' perception about the endurance of IPO returns in the longer run as compared to the rest, existing and more "established" market of listed equities. It is not unlikely that if market adjusted returns were examined across different equity markets, developed as well as emerging ones, for the period 1990 – 2007, which was a more positive equity valuation cycle, then the picture might have been much more favourable with market adjusted returns even turning to be positive. That however could not be the case in the US IPO market during the period 1980 – 2006. On average, market adjusted return settled at –20.3% over that extended period of time, with the weakest performance realized in smaller IPO issues as compared to larger ones.

TABLE 10: International Evidence of IPO Long-Run Performance Market Adjusted Returns

Country	*Study*	*Sample Period*	*Sample size*	*Window (years)* (a)	*Return (%)* (b)
Germany	Ljungqvist (1997)	1970-90	145	3	-12,1
Australia	Lee ***et al.*** (1994)	1976-89	266	3	-51,0
Brazil	Aggarwal ***et al.*** (1993)	1980-90	62	3	-47,0
Canada	Shaw (1971)	1956-63	105	5	-32,3
Chile	Aggarwal ***et al.*** (1993)	1982-90	28	3	-23,7
Korea	Kim ***et al.*** (1995)	1985-88	99	3	+91,6
United States	Stigler (1964 a, b)	1923-28	70	5	-37,7
United States	Simon (1989)	1926-33	35	5	-39,0
United States	Simon (1989)	1934-40	20	5	+6,2
United States	Stigler (1964 a, b)	1949-55	46	5	-25,1
United States	Cusatis ***et al.*** (1993)	1965-88	146	3	+33,6
United States	Loughran (1993)	1967-87	3.656	6	-33,3
United States	Loughran y Ritter (1995)	1970-90	4.753	5	-30,0
United States	Ritter (1991)	1975-84	1.526	3	-29,1
Finland	Keloharju (1993)	1984-89	79	3	-21,1
Great Britain	Levis (1993)	1980-88	712	3	-8,1
Hong Kong	McGuinness (1993)	1980-90	72	2	-18,3
Japan	Cai y Wei (1997)	1971-90	172	3	-27,0
Singapur	Hin y Mahmood (1993)	1976-84	45	3	-9,2
Sweden	Loughran ***et al.*** (1994)	1980-90	162	3	+1,2
Switzerland	Kunz y Aggarwal (1994)	1983-89	34	3	-6,1

(a) Window is the number of years over which after-market returns are recorded.
(b) Returns are calculated over the investment window and thus are annualised, exclude the initial under pricing return, and are generally market-adjusted, but not risk-adjusted. Some authors use a range of benchmarks; in these cases, a representative result is shown. Computation methodologies vary.
• Source: LOUGHRAN , T. et al. (1994): “Initial Public Offerings: International Insights”. Pacific-Basin Finance Journal, vol. 2, pp. 165 – 199.

The IPO returns of the aggregate period 1995 – 2007 of the Greek equity market are also examined by calculating the cumulative as well as market adjusted returns. The following two tables present the corresponding results. The aggregate period 1995 – 2007 experienced positive returns for the Greek IPOs. All monthly / cumulative returns and market adjusted returns calculated were based on a number of IPOs that exceeded 200. The fact that the largest part of the aggregate period 1995 – 2007 was characterized by rising equity prices (apart from the period 2000 – 2003) explains to a large extent the positive IPO returns realized over the above 13-year period.

However according to a large part of international literature, it is not certain whether this would hold for both a larger IPO sample and a larger period such as 30-40 years, which tend to encompass longer both bull and bear markets. For example, a different view is offered in a study by Alan Gregory, Cherif Guermat and Fawaz Al-Shawawreh (2009) titled “UK IPOs: Long Run Returns, Behavioural Timing and Pseudo Timing”. The study examined a comprehensive set of 2,499 UK IPOs launched between mid-1975 and the end of 2004. It was found compelling evidence of long run underperformance that persisted for between 36 and 60 months post-flotation, depending on the precise method chosen to measure abnormal returns. The analysis also revealed that, consistent with the findings of other studies, IPO under-performance was concentrated in smaller firms.

Another study by Paul A. Gompers and Josh Lerner (2001) titled “The Really Long-Run Performance of Initial Public Offerings” sought to shed further light on the real performance of IPOs using data of US IPOs (Nasdaq). The study examined the performance for up to five years after listing of nearly 3,661 initial public offerings in the United States from 1935 to 1972. The sample displayed some evidence of underperformance when event-time buy-and-hold abnormal returns are used. The underperformance disappeared, however, when cumulative abnormal returns were utilized. A calendar-time analysis also showed that over the entire sample period—i.e., from 1935 to 1976—IPOs returned as much as the market. The above findings appear to deviate from the broadly and internationally held view of IPOs’ long-run underperformance.

TABLE 11: Monthly and Cumulative Returns of Greek IPOs (for 36 Months) during the aggregate period 1995 - 2007

[We examine new listings that took place during the aggregate period 1995 – 2007 and we calculate their returns for the full 36-month period or the remaining period.]

Period 1995 - 2007			
MONTH	**MONTHLY RETURN**	**CUMULATIVE RETURN**	**NUMBER of IPOs**
1	5.34%	5.34%	239
2	1.93%	7.18%	238
3	2.67%	12.66%	238
4	2.32%	17.60%	238
5	1.30%	21.11%	238
6	0.41%	20.84%	237
7	1.67%	22.02%	237
8	0.06%	27.12%	237
9	2.34%	34.07%	236
10	0.73%	40.61%	236
11	0.70%	42.75%	236
12	0.46%	40.37%	235
13	0.10%	44.43%	235
14	-0.97%	42.30%	234
15	0.55%	42.06%	233
16	-0.77%	38.48%	233
17	-0.72%	42.59%	233
18	0.96%	45.85%	232
19	0.87%	48.47%	230
20	-0.65%	49.40%	230
21	-0.75%	53.68%	228
22	0.79%	57.86%	227
23	2.57%	58.77%	227
24	0.57%	58.25%	227
25	-0.69%	54.48%	225
26	0.55%	61.70%	223
27	-1.80%	60.23%	223
28	1.53%	69.82%	223
29 (*)	-1.74%	70.02%	223
30	0.10%	74.20%	218
31	1.09%	87.33%	216
32	3.13%	108.85%	214
33	-0.38%	116.52%	213
34	2.82%	112.40%	211
35	4.10%	123.43%	210
36	1.68%	120.25%	210

Source: Athens Exchange share price data.
(*) Extreme values have been excluded from calculation of returns.
Explanatory note: The empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns

TABLE 12: Market Adjusted Returns of Greek IPOs (for 36 Months) Period 1995 - 2007

[New listings that took place during the period 1995 – 2007 were examined. Market adjusted return is the difference between the Athens Exchange General Index cumulative return and the IPO cumulative return.]

Period 1995 - 2007			
MONTH	**CUMULATIVE GENERAL INDEX RETURN**	**CUMULATIVE IPO RETURN**	**MARKET ADJUSTED RETURN**
1	-1.88%	5.34%	7.22%
2	-2.59%	7.18%	9.77%
3	-5.42%	12.66%	18.08%
4	-3.21%	17.60%	20.81%
5	-5.14%	21.11%	26.25%
6	-7.73%	20.84%	28.57%
7	-7.18%	22.02%	29.21%
8	-7.80%	27.12%	34.92%
9	-7.36%	34.07%	41.43%
10	-5.45%	40.61%	46.06%
11	-7.53%	42.75%	50.28%
12	-5.89%	40.37%	46.26%
13	-3.39%	44.43%	47.82%
14	0.56%	42.30%	41.74%
15	-3.64%	42.06%	45.70%
16	-5.99%	38.48%	44.47%
17	-4.36%	42.59%	46.94%
18	-6.77%	45.85%	52.61%
19	-4.29%	48.47%	52.76%
20	-2.16%	49.40%	51.57%
21	-2.70%	53.68%	56.38%
22	-2.11%	57.86%	59.97%
23	-0.40%	58.77%	59.17%
24	9.56%	58.25%	48.69%
25	20.78%	54.48%	33.71%
26	19.22%	61.70%	42.49%
27	24.54%	60.23%	35.69%
28	31.49%	69.82%	38.33%
29 (*)	25.50%	70.02%	44.52%
30	20.47%	74.20%	53.73%
31	28.98%	87.33%	58.36%
32	29.97%	108.85%	78.88%
33	34.48%	116.52%	82.03%
34	21.55%	112.40%	90.85%
35	28.65%	123.43%	94.78%
36	29.22%	120.25%	91.03%

Source: Athens Exchange share price data.
(*) Extreme values have been excluded from calculation of returns.
Explanatory note: The empirical work is based on collecting data on IPOs and share prices from the Athens Exchange and processing the above data in order to extract absolute and relative returns

In this section, the long-run performance of Greek IPOs during the period 1995 – 2007 was examined. The period was divided in three sub-periods under the rationale of the different equity market cycles taking place in ach sub-period. It became evident that equity cycles had a determinant effect on the performance of Greek IPOs, with newly listed stocks performing strongly positive in periods of favourable market sentiment, and vice versa. In overall, investors realized satisfactory positive absolute and market adjusted returns from the Greek IPOs over the long-run in the majority of equity cycles of the period under consideration.

The analysis of the long-run performance of international IPOs considered mainly the US market as well as other major geographic markets and presented additional points of view, which however cannot be fully matched with corresponding findings from the Greek IPO market. However there has been considerable light on the scope and substance of the long-run performance between Greek and international, mainly US, new listings and the following points can be drawn out of the above comparison. Greek as well as international IPOs demonstrated positive cumulative returns in the long-run defined as the 3-year period from the stock's initial trading day during the period 1980 - 2007. Positive cumulative returns in Greek IPOs are more enhanced and in some occasions become excessive, due to the fact that Greece was and still is, in essence, a market with emerging characteristics. Therefore, stock returns tend to reach extreme levels either positive or negative depending on the equity market cycle. The periods examined for Greek and US / international IPOs consist mostly of sub-periods of rising stock markets internationally, thus affecting accordingly the IPO returns. In favourable equity market cycles, investors' appetite for new listings is apparently stronger during both the offering and the post offering period. The overall positive returns are based on a number of IPOs, which is deemed significant for each market's standards or dynamics and for periods greater than a decade. 245 new listings were examined in the Greek market during the period 1995 - 2007 and the findings of J. R. Ritter's sample of 7,071 firms in the US market during an even longer period, 1980 – 2006 were discussed along with evidence of IPO performance in additional geographic markets. Furthermore IPO returns on relative terms were also analysed pointing that although internationally market adjusted returns turned out negative, Greek IPO market adjusted returns were mostly positive.

In overall, it was easily observed that during certain periods of time, especially those that coincided with favourable equity market cycles, long-term (buy and hold) IPO returns were positive or significantly positive. This conclusion should be of no surprise since it is perfectly normal that newcomer stocks with promising prospects tend to easily attract investors' appetite for risk. In some cases those abnormal returns were realized because the investment community considered newly listed stocks as great opportunities even in sectors that might have been mature but those companies were not. Furthermore, the trading market of those newly listed stocks might have been,

at least initially, thin and therefore IPO performance was easily influenced by the broader optimistic sentiment, which surrounded IPOs since the mid 1980s. In synopsis, the major factors for the positive IPO returns in the long-run were the favourable market cycles, the investors' perceptions of newly listed stocks as great opportunities, the high demand for IPOs, and the thin trading depth for the most of those newcomers that allowed the initial market enthusiasm to spread out among participants and sustain in the longer run. For fund managers, IPOs turned out to be a wise investment action as returns appeared "guaranteed" in certain periods, whereas for financial managers and CEOs the listing of a company in a stock market meant the opening of a large, apparently vast, pool of funds and at the same time implied the recognition of the company's financial achievements by the broader local as well as international investment community.

In contrast, for most IPO markets, apart from the Greek market during most of the period 1995 – 2007, market adjusted returns turned out to be negative or significantly negative for several periods examined. As mentioned previously, the negative market adjusted returns may have been due to the unfavourable equity market cycles and also due to investors' perception about the endurance of IPO returns in the longer run as compared to the rest, existing and more "established" market of listed equities. Furthermore, another determinant factor might have been the deteriorating quality of IPO entries as underwriters in an effort to feed the market with greater number of IPOs – via either small or large sale volumes – tended to monitor to a lesser extent the real prospects and potential of those newcomers. Fund managers and investors understood the risk of placing larger funds in an IPO market of deteriorating quality and therefore moved interest to buying the already listed and "established" equities to more efficiently balance their constantly changing risk profile. In short conclusion, IPOs constitute a significant investment option, however for different time periods investors have to carefully examine the IPO candidates not only to attain the highest possible returns in the long-run but also to beat the market. The fact that Greek IPO market adjusted returns were mostly positive, demonstrates different investor perceptions in the Greek market, which are aligned with its more volatile characteristics over longer time periods.

5.4 Conclusions

The objective of this chapter was to test the market adjusted as well as the absolute cumulative returns investors realized by placing their funds into newly listed stocks on the Athens Exchange during the most developed phase in the history of the Greek equity market. Based on a sample of 245 firms listed and traded on the Athens Exchange, the absolute long-run returns investors realized by placing their funds into newly listed stocks during the period 1995 – 2007, were calculated. The period was divided in three sub-periods under the rationale of the different equity market cycles taking place each time. It became evident that equity cycles had a determinant effect on

the performance of Greek IPOs, with newly listed stocks performing strongly positive in periods of favourable market sentiment, and vice versa. In overall, investors realized satisfactory positive returns from the Greek IPOs over the long-run in the majority of equity cycles of the period under consideration.

The first sub-period 1995 – 1999 experienced positive returns for the Greek IPOs. On monthly basis, there were only 7 occasions out of 36 in total, when IPO returns turned negative however along a very low and narrow range, between -0.2% and -2.80%. Average cumulative returns appeared strongly positive and accelerated, starting with 11.88% in the 1-month period and ending with 280% in the 36-month period, while the peak level was observed in the 29-month period with 361%.

The second sub-period 2000 – 2003 demonstrated low positive and mostly negative returns for the Greek IPOs. On monthly basis, there were 24 occasions out of 36 in total, when IPO returns turned negative however along a very low and narrow range, between -0.2% and -4.50%. Average cumulative returns appeared negative and escalated, starting with -6% in the 6-month period and ending with 34% in the 36-month period, while the highest negative cumulative return was observed in the 32-month period with 38.61%.

Finally, the third sub-period 2004 – 2007 was characterized by a mixed picture for Greek IPOs with a “tendency” towards positive monthly returns as well as positive cumulative returns for periods greater than 21 months. On monthly basis, there were 22 occasions out of 36 in total, when IPO returns turned positive exceeding in three months (22^{nd}, 23^{rd} and 34^{th}) the level of 10%. Monthly returns higher than 10% were not apparent even in the more favourable IPO period of 1995 – 1999.

In a later stage, an attempt was made to compare the findings from the Greek IPO market with the ones presented in the international literature covering long-run IPO returns in various international markets, with a special emphasis on the US market, the most active and structured IPO market in the world, as well as additional geographic markets across the globe. It was concluded that Greek as well as US and international IPOs demonstrated positive cumulative returns in the long-run, defined as the 3-year period from the stock’s initial trading day during the period 1980 - 2007.

The study also examined potential out performance or under performance of IPOs based on benchmark indices. The calculation of market adjusted returns during the three sub-periods, 1995-1999, 2000 – 2003 and 2004 – 2007, revealed similar patterns in the extracted data with the ones observed in the case of absolute monthly and cumulative returns.

The first sub-period, 1995 – 1999, was characterized by strong and positive market adjusted returns for the newly listed Greek stocks. Those returns evolved through an accelerating pattern. The second sub-period, 2000 – 2003, was characterized by moderate positive market adjusted returns for the

newly listed Greek stocks. The third sub-period, 2004 – 2007, was characterized by negative market adjusted returns that accelerated as the time horizon expanded. In contrast, for most IPO markets, apart from the Greek market during most of the period 1995 – 2007, market adjusted returns turned out to be negative or significantly negative for several periods examined.

The aggregate period 1995 – 2007 experienced positive returns for the Greek IPOs. All monthly / cumulative returns and market adjusted returns calculated were based on a number of IPOs that exceeded 200. The fact that the largest part of the aggregate period 1995 – 2007 was characterized by rising equity prices (apart from the period 2000 – 2003) explains to a large extent the positive IPO returns realized over the above 13-year period.

The results of the analysis of Greek IPO returns in the long-run appeared to be more favourable in comparison with the evidence observed in the international IPO market. As a general conclusion, it could be drawn that during certain periods of time, especially those that coincided with favourable equity market cycles, long-term (buy and hold) IPO returns were positive or significantly positive for both Greek and international newly listed stocks. Therefore IPOs constitute a significant investment option for investors across the globe. However, for different time periods investors have to carefully examine the IPO candidates not only to attain the highest possible returns in the long-run but also to beat the market.

Chapter 6
Investigation of Factors that Influence Long-Run Performance

6.1 Introduction

In this chapter, several factors that may influence the long – run performance of Greek IPOs are investigated. There are a number of hypotheses regarding the possible explanation for IPOs. Generally, the literature on under pricing relates the under pricing phenomena to ex-ante uncertainty [Beatty and Ritter (1986), Rock (1982)]. In line with these studies, a positive relationship between the level of under pricing and the level of ex-ante uncertainty of a new issue is expected. Since it is not possible to measure ex-ante uncertainty directly, a number of variables are used as proxies.

6.2 Data & Methodology

The methodology followed, was a multivariate regression analysis. One-month, 12-month, 24-month, and 36-month cumulative market adjusted returns were used as dependent variable. From the other hand, the following variables were employed to explain under pricing.

Firm Size (SIZE): There are two size variables used commonly in IPOs studies. One is the total assets of the firm prior to going public, and the other is the gross proceeds raised by flotation. The size variable is employed to capture the possibility that small IPOs are more speculative than larger IPOs. Hence, larger IPOs are expected to have lower uncertainty as compared to smaller IPOs. This variable is measured as the natural logarithm of total asset value at the end of year, prior to the year of going public. A negative coefficient is expected for this variable.

Operating History (AGE): The operating history of firm prior to going public is also employed as proxy for ex-ante uncertainty. Since older firms have more public information available than younger firms, the older firms are expected to have lower ex-ante uncertainty compared to younger firms. Hence lower under pricing is expected for older firms. The age of the firm in years on flotation is used as variable and it is expected to be inversely related to the level of under pricing.

ELECTIONS: In order to analyse the effect of elections on IPOs performance, a dummy variable is employed. This variable takes value of one if IPO is taking place during elections (because the expectations from the result of the elections), and zero otherwise.

Multiple Regression Model for Long-Run Performance of Greek IPOs

Return $=b_0+b_1(\text{Size})+b_2(\text{Age})+b_3(\text{Elections}) + e$

Where:

- Returns = market adjusted buy and hold returns
- Size = the natural logarithm of the total assets of firm prior to offering
- Age = the number of years in operation (operating history) before the offering
- Elections = a dummy variable taking on the value of one if is taking place during elections (because the expectations from the result of the elections), and zero otherwise

6.3 Results of Multiple Regressions

1995 – 1999

By employing the previously used explanatory variables, cross-sectional variations in long-run returns for the period 1995 – 1999 are reported in Table 1. One-month, 12-month, 24-month, and 36-month cumulative market adjusted returns were used as dependent variable.

TABLE 1

Holding Period	**Month 1**	**Month 0-12**	**Month 0-24**	**Month 0-36**
Variables	**1**	**2**	**3**	**4**
Constant	-0,028	3,540	6,012	2,663
	(-0,121)	(1,727)	(1,996)	(0,477)
Size	0,008	-0,153	-0,262	-0,017
	(0,636)	(-1,25)	(-1,510)	(-0,053)
Age	-0,002	-0,011	-0,008	0,006
	(-1,08)	(-0,631)	(-0,325)	(0,133)
Elections	0,024	0,740	0,506	0,358
	(0,425)	(1,532)	(0,713)	(0,273)
R^2	0,018	0,035	0,025	0,001

The results of all regressions indicate that no variable is significant at 5% or 10% level. Therefore for the specific period, other factors that may influence the long-run performance should be investigated.

2000 – 2003

Cross-sectional variations in long-run returns for the period 2000 – 2003 are reported in Table 2. One-month, 12-month, 24-month, and 36-month cumulative market adjusted returns were used as dependent variable.

TABLE 2

Holding Period	**Month 1**	**Month 0-12**	**Month 0-24**	**Month 0-36**
Variables	**1**	**2**	**3**	**4**
Constant	-0,21	-0,66625	-1,31535	-1,60787
	(-0,723)	(-0,92134)	(-2,10945)	(-1,49282)
Size	0,015	0,050242	0,076839	0,092584
	(0,878)	(1,145432)	(2,031591)	(1,417162)
Age	-0,001	-0,00519	-0,00362	0,000113
	(-0,650)	(-1,21636)	(-0,98338)	(0,017717)
Elections	-0,039	-0,41115	-0,4645	-0,59096
	(-0,804)	(-3,41826)	(-4,47852)	(-3,29864)
R^2	0,015	0,124	0,198077	0,119455

The results of first regression indicate that no variable is significant at 10% or 5% level.

In the second regression, the dependent variable is 12-month CARs. Here, one of the variables is significant and none of the other variables are found to be statistically significant. The Elections variable is significant and there exist inverse relationship between election and firm performance in 12 month period.

In the third regression, the dependent variable is 24-month CARs. Here SIZE variable and ELECTIONS are significant. SIZE, and ELECTIONS variables are significant determinants of long-run performance of IPOs. So there exist relationship between firm size and firm performance in 36 month period. Smaller firms perform better than the larger firms.

In the fourth regression, the dependent variable is 36-month CARs. In this regression one of the variables is significant and none of the other variables are found to be statistically significant. The Elections variable is significant and there exist inverse relationship between election and firm performance in 36 month period.

2004 – 2007

Cross-sectional variations in long-run returns for the period 2004 – 2007 are reported in Table 3. Only, one-month and 12-month, cumulative market adjusted returns were used as dependent variable for this period due to inadequate data.

TABLE 3

Holding Period	**Month 1**	**Month 0-12**
Variables	**1**	**2**
Constant	-0,43697226	-0,90372713
	(-0,92466745)	(-0,77495139)
Size	0,022486149	0,060749761
	(0,814745936)	(0,891984144)
Age	0,001928958	0,005102605
	(0,56934158)	(0,610305936)
Elections	-0,05270321	-0,47407231
	(-0,58501161)	(-2,13244307)
R^2	0,233710442	0,44902788

The results of first regression indicate that no variable is significant at 10% or 5% level.

In the second regression, the dependent variable is 12-month CARs. Here, one of the variables is significant and none of the other variables are found to be statistically significant. The ELECTION variable is significant and there exist inverse relationship between election and firm performance in 12 month period.

6.4 Conclusions and Views

When the factors influencing the long-run performance of Greek IPOs were investigated, the size of issuer and mainly the elections appear to be some of the main determinants of the initial under pricing. Although an observer could add that the relation of the long-run performance and the factors influencing this performance is an unresolved issue. It has always been some-what of a mystery why IPOs are priced in a manner that results in such large positive average returns even in the long-run. Maybe, the offering price is not too low, but that the aftermarket price is too high. If issuers and their investment bankers set the offering price in a manner that reflects the firm's underlying fundamental value, however, it is even more of a mystery why some offerings have extremely high returns.

An additional view shedding light on the equity market factors affecting long-run returns of IPOs is given by Ritter (1991) and Rajan and Servaes (1994). Those researchers argued that firms go public when investors are over-optimistic about the growth prospects of IPO companies. Investors overpay initially but mark prices down as more information becomes available hence expected long-run returns decrease with the decrease in initial investor sentiment. In the case of the Greek IPOs such a development is observed in the second sub-period 2000 – 2003, following the market peak of the Greek market in 1999. Investors realized that the economic downturn would harden the newly listed companies' efforts to fulfil their prospects thus their stock price performance was negatively affected.

Finally, another study by Dimitrios Ghicas, Georgia Siougle and Leonidas Doukakis, titled "Determinants of Stock Returns Subsequent to Initial Public Offerings" investigated the relation between the intended uses of IPO proceeds and long-run stock returns of firms going public at the Athens Stock Exchange. The study found that investments in fixed assets and investments in working capital were positively associated with post-IPO stock returns. Furthermore, the study explored investors' reactions on information releases about the revision of the designation of the IPO cash proceeds. Decisions regarding changes in the uses of IPO proceeds regarding investments in fixed assets and in other affiliates were negatively related to the value of the firm.

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Chapter 7
Final Conclusions

The objective of the research report was to test the market adjusted as well as the absolute cumulative returns investors realized by placing their funds into newly listed stocks on the Athens Exchange during the most active phase in the history of the Greek equity market. Based on a sample of 245 firms listed and traded on the Athens Exchange, the absolute long-run returns investors realized by placing their funds into newly listed stocks during the period 1995 – 2007, were calculated. The period was divided in three sub-periods under the rationale of the different equity market cycles taking place each time. It became evident that equity cycles had a determinant effect on the performance of Greek IPOs, with newly listed stocks performing strongly positive in periods of favourable market sentiment, and vice versa. In overall, investors realized satisfactory positive returns from the Greek IPOs over the long-run in the majority of equity cycles of the period under consideration. The study also examined potential out performance or under performance of IPOs based on benchmark indices. The calculation of market adjusted returns during the three sub-periods, 1995-1999, 2000 – 2003 and 2004 – 2007, revealed similar patterns in the extracted data with the ones observed in the case of absolute monthly and cumulative returns. When the aggregate period 1995 – 2007 was examined in order to calculate monthly and cumulative as well as market adjusted IPO returns, the majority of IPO returns turned out positive confirming the conclusions of the different sub-periods.

The results of the analysis of Greek IPO returns in the long-run appeared to be more favourable in comparison with the evidence observed in the international IPO market. As a general conclusion, it could be drawn that during certain periods of time, especially those that coincided with favourable equity market cycles, long-term (buy and hold) IPO returns were positive or significantly positive for both Greek and international newly listed stocks. Therefore IPOs constitute a significant investment option for investors across the globe. However, for different time periods investors have to carefully examine the IPO candidates not only to attain the highest possible returns in the long-run but also to beat the market.

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NOTES

NOTES

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