

# *Innovation and upheaval: early growth in Greek capital market listings and IPOs from 1880 to the Second World War in the Athens Stock Exchange<sup>†</sup>*

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The establishment and growth of the Greek stock market were coincident with development episodes, financial upheavals, and geographic expansions of the country's economy over the period 1880–1940. This article explores the growth of the Athens Stock Exchange through new listings and initial public offerings (IPOs) in the late nineteenth and early twentieth centuries. We examine changes in exchange governance and listing requirements. On a theme not addressed before, we find that simple listings were far more numerous than actual IPOs. IPOs in Greece remained unregulated throughout the period. Their under-pricing became pronounced in the later parts of the period, especially the 1920s. The study presents data on 'quasi-IPOs' (that is, capital increases shortly after listing) and shows that they offer a more accurate assessment of the demand for the financing of listing firms in an emerging market. Robust evidence is presented to show that as the Exchange developed it also underwent a change in character, becoming more oriented to the domestic market and catering to smaller firms in domestic manufacturing in the post-First World War era that marked the end of early globalization.

The object of this article is to study listings and public offerings of securities on the Athens Stock Exchange (ASE) from its inception in 1880 to the entry of Greece into the Second World War in 1940. No previous comparable research exists for the growth of the Greek Stock Exchange. This is a first study of capital raising

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<sup>†</sup> We gratefully acknowledge the editor in charge of this article (Jaime Reis), editorial assistant (Heather Falvey), and three anonymous referees for their detailed and insightful comments. We also thank Adrian Bell, Carsten Burhop, Walid Busaba, Brian Cheffins, David Chambers, Olga Christodoulaki, Georgios Dertilis, Elroy Dimson, Nikolaos Filippas, Caroline Fohlin, William Goetzman, Andreas Kornelakis, Sibylle Lehman, Jay Ritter, Christian Schlag, Nikolaos Travlos, Steve Toms, and seminar participants at the Department of Economics at the University of Athens, the Department of Accounting and Finance at Athens University of Economics and Business, the Department of Economics at the University of Piraeus, the Department of Accounting and Finance at the University of Leeds, the Department of Business and Management at the University of Sussex, and the Centre for Planning and Economic Research for useful comments and suggestions. We would like to thank participants of the European Business History Conference 2013 in Uppsala for helpful comments on earlier versions of this article. Special thanks are due to the Hellenic Observatory at the London School of Economics and an anonymous reviewer at LSE and to the Greek Parliament, the Athens Stock Exchange, the National Bank of Greece and the Hellenic Capital Market Commission for data availability.

in an emerging European exchange to be juxtaposed with several such studies of developed exchanges in the late nineteenth and early twentieth centuries.<sup>1</sup>

Stock exchanges are trade venues, but their longer-term significance lies in their role in the funding of public and private ventures and the growth of firms and sectors. The impetus for the development of exchanges in Europe since the eighteenth century has been furnished by the need to amass capital resources. Exchanges combine the collection of capital with the advantage of secondary trading. These two fundamental aspects of growth are not inseparable. Listing on an exchange can occur with or without a concurrent public offering. Whereas a public offering is a direct capital-gathering exercise, listing can make an indirect contribution by increasing the visibility and the reputation of a potential issuer. In developed liquid markets, public offers are a very visible activity. In emerging, less liquid markets, however, simple listings may predominate in market development. The present study focuses on listings and public offerings as separable aspects of capital gathering. Our findings underpin this separation: public offerings in the ASE were relatively limited, even during periods when listings were in high demand. We offer analysis of this feature.

The creation of the ASE was the second major financial innovation in nineteenth-century Greece, after the establishment of the National Bank in the 1840s. By way of acknowledging the international context, we note that the late nineteenth century was a period of 'emergence' of many peripheral stock markets in Europe and the rest of the world. These markets grew alongside well-established ones in the European centres.<sup>2</sup> Their 'emergence' was correlated with the rise of international capital flows to new sovereign states, especially in the form of government loans.<sup>3</sup> The ASE was no exception. Officially chartered over the period 1876–8, it started operations in 1880. In 1878 the Greek state had regained access to foreign finance after an embargo of 45 years. The ASE, in which both government bonds and private stocks would trade, was a necessary mechanism for capital gathering and transfer, and would prove to be one of the longest-lived institutions in modern Greece.

Greek political and economic history was turbulent over the period 1880–1940. The country's area and population practically doubled. Changes were not gradual but abrupt, mostly outcomes of wars that were won and wars that were lost; and there was a succession of periods that ranged from sovereign bankruptcy in 1893 to impressive leaps in development in the early 1900s and the 1920s. Over the 60 years covered in this study, Greece was embroiled in six wars and two sovereign bankruptcies. The Exchange evolved along a path defined by economic conditions of each period.<sup>4</sup> Arguably, it provided a mechanism for mobilization of resources

<sup>1</sup> See studies on London, Berlin, and New York by Derrien and Kecskés, 'Initial public offerings'; Chambers, 'Gentlemanly capitalism revisited'; Lehmann, 'Underwriter activity'; Chambers, 'Going public'; Fohlin, 'Asymmetric information'; Fohlin and Reinold, 'Common stock returns'; Burhop; 'Underpricing'; Burhop, Chambers, and Cheffins, 'Regulating IPOs'; Lehmann, 'Taking firms'.

<sup>2</sup> Battilossi and Morys, 'Emerging stock markets'.

<sup>3</sup> Bouvier, *Initiation*, and O'Rourke and Williamson, *Globalization and history*, discuss the rise of international capital flows.

<sup>4</sup> These have discussed historic economic conditions during various periods: Valaoritis, *Historia*; Dertilis, *Historia*; Papagiannakis, *Oi Ellinikoi Sidirodromoi*; Kostis, *Les enfants gâtés*; Psalidopoulos, *H krissi*; Vaxevanoglou, *Oi Ellines kapitalistes*; Kokinakis, *Nomisma kai politiki*; Kremmidas, *Eisagogi*.

and modernization through the recapitalization of older firms and the emergence of new ventures and sectors.

Recent historical research on financial development has been influenced by prevalent institutional theories: one is the view of the positive impact of ‘common law’ systems;<sup>5</sup> the other is the view of the positive impact of ‘openness’ and capital flow liberalization which contain the power of domestic financial incumbents and liberate a financial dynamic.<sup>6</sup> The Greek legal system has been of the continental variety so that it cannot explain the variation between periods of market development and periods of stagnation. On the front of economic openness and the perspective argued by Rajan and Zingales, Greece followed the general path of many other European countries. It remained open to capital flows and participated in the rise of globalization up to the First World War. From that point on, Greece became a relatively closed economy but, interestingly, one with expanding frontiers. The actual occurrence and direction of capital flows varied throughout the period, especially as a result of sovereign bankruptcies, wars, and the collapse of international monetary systems. In sum, we argue that the variation between stock market development and stagnation and the character of development cannot be *prima facie* attributed to large shifts in the legal system, but can be understood on the basis of economic ‘openness’ and economic size. In addition, and since historical detail matters, we focus on economic conjuncture and the factors affecting variation of the size and character of the domestic market that expanded significantly over the period of study. We provide a test of the relation of listing activity with economic growth, and find positive results.

Financial theories of capital gathering establish useful propositions that can inform historical study. It is generally acknowledged that markets for external finance can only function if there is an adequate level of trust between investors, issuers, and sponsors. In a variety of financial models, a specific aspect of trust is represented as informational asymmetry. Prior argument and evidence indicate that such asymmetry can make the cost of external finance so high as to be prohibitive.<sup>7</sup> In a theoretical context more directly applicable to initial public offerings (IPOs), it is argued that asymmetric information among investors leads to underpricing of new issues, an effect likened to a ‘winners’ curse’.<sup>8</sup> A considerable strand of subsequent literature has upheld the notion that institutional, regulatory, and governance arrangements can mitigate asymmetries and improve trust.<sup>9</sup> However, extensive empirical work in contemporary markets has verified considerable underpricing of new equity issues, but with much variation across time and space.<sup>10</sup>

<sup>5</sup> The legal rules covering protection of corporate shareholders and creditors in 49 countries have been examined by La Porta, Lopes-de-Silanes, Shleifer, and Vishny, ‘Law and finance’.

<sup>6</sup> Rajan and Zingales, ‘Great reversals’, offer comparative aspects of stock market capitalization to GDP ratios and the number of listed companies per million people.

<sup>7</sup> Myers and Majluf, ‘Corporate financing’, show that firms may refuse to issue stock, and therefore may pass up valuable investment opportunities.

<sup>8</sup> The ‘winners’ curse’ argument by Rock, ‘New issues’, depends upon the existence of a group of investors whose information is superior to that of all other investors.

<sup>9</sup> Beatty and Ritter, ‘Investment banking’; Loughran and Ritter, ‘IPO underpricing’; Ljungqvist, ‘IPO underpricing’.

<sup>10</sup> There are several studies of public offerings in the ASE but all focus on recent periods beginning with the 1980s. For example, Kazantzis and Levis, ‘Price support’; Thomadakis, Gounopoulos, and Nounis, ‘Long term performance’; Thomadakis, Gounopoulos, Nounis, and Merikas, ‘Collateral regulation’. There are also a few,

Taking the cue from contemporary markets, historical researchers have focused on capital gathering in the major European markets (where transactions and data are ample) and have examined the underpricing phenomenon in IPOs of the late nineteenth and early twentieth centuries. Chambers and Dimson, examining the track record of the London Exchange, make a remarkable observation: a long-term rise in underpricing appears to have occurred over time, in spite of improvements in regulation, disclosure, and the prestige of IPO underwriters.<sup>11</sup>

Working on the Berlin Exchange, Fohlin shows that investors in new stock issues in Germany in the 1880s experienced, on the contrary, low spreads between the price they paid for stock and the price at which they could sell the stock in the market.<sup>12</sup> Evidence reveals that during the early twentieth century IPOs were regulated more heavily in Germany than in Britain and as a result the failure rate of IPOs on the Berlin Stock Exchange was lower than it was in London.<sup>13</sup> Even though German IPO business was in the hands of an oligopoly, the terms of IPOs, through tight regulation of underwriting, ensured the quality of firms on the German market.<sup>14</sup> We draw a lesson from regulatory experiences in early developed markets, as compared to a peripheral one with minimal regulation.

A peripheral emerging market, like the ASE in the nineteenth century, cannot be approached on the same footing and with the same analytical agenda as developed central markets in Europe, where frequent transactions and ample data are available. Its institutional reputation had to be established and its liquidity had to be secured in an environment where liquidity was generally scarce and monetary values exhibited great fluctuation. It follows that when we examine listing requirements and the growth of the Exchange in terms of listings and primary offerings, we must be cognizant of a more general correlation of the path of the Exchange to economic and political conditions. Thus, we pay much attention to historical circumstance in the Greek economy over the period.

Unlike studies focusing on developed markets, we have expanded the meaning of IPOs to capital increases occurring in the two years following listing. We have collected data on these capital increases and compare them to actual primary offerings. The view of listings as a first step towards the raising of external capital finds support from these comparisons.<sup>15</sup> We also undertake limited analysis of IPO underpricing itself, within the confines of our small number of observations. The results are not surprising in the face of contemporary international evidence.

IPOs remained unregulated throughout the period and there is little evidence concerning the involvement of professional investment banking in primary security

mostly official, histories of the exchange which do not illuminate sufficiently its fundamental function of capital gathering and company finance; see Platanopoulos, *Historia*.

<sup>11</sup> Chambers and Dimson, 'IPO underpricing over the very long run', p. 1, present evidence covering British IPOs since the First World War. During the period from 1917 to 1945, public offers were underpriced by an average of only 3.80%, as compared to 9.15% in the period from 1946 to 1986.

<sup>12</sup> Fohlin, 'Asymmetric information', p. 632. Underwriters exploited their access to better information (agency problems) and had market power.

<sup>13</sup> IPOs listed on the London Stock Exchange performed as well as Berlin IPOs, despite the Berlin market being more regulated; Burhop, Chambers, and Cheffins, 'Regulation'.

<sup>14</sup> Lehmann, 'Taking firms'.

<sup>15</sup> In a modern study involving 786 IPOs in the LSE, Derrien and Kecskés, 'Initial public offerings', p. 452, present the case of a number of firms that list without issuing equity and then issue equity shortly after listing; they conclude that this two-stage offering strategy is less costly than an IPO because trading reduces the valuation uncertainty of these firms before they issue equity; *ibid.*, p. 448.

issues and their pricing. This is a major difference from developed markets of that period, where IPOs were regulated and investment banking was formalized. It does not appear that standardized arrangements of investment banking emerged in Greece, although some services of investment bankers were provided. Hence, disclosure quality remained uneven and low. The population of IPOs was also low. It is noteworthy nonetheless that even in this small population underpricing made an appearance a considerable time after the end of the First World War. We present historical conjectures for the timid growth of IPOs and look at possible factors to explain IPO pricing in line with the empirical literature.

The early enlargement of the Greek stock market was clearly driven by demand for listings. This implies that, contrary to what we know of developed markets, the study of listings is a pillar for understanding the evolution of peripheral markets. In the Greek case, we document a decisive shift in the character, size, and sector of listings and IPOs between the first decades of ASE operation and the boom decade of the 1920s. This shift was related to a reorientation of economic activity, with emphasis on light domestic manufacturing. It also correlated to stock market entries by smaller firms, a phenomenon that may be described as a ‘democratization of market finance’. Interestingly, this democratization was evident in the population of listings but also implied visible changes in pricing of primary offerings.

The rest of the article is organized as follows. Section I discusses the creation of the ASE, the evolution of its governance, and listing requirements. Section II presents the periodization of our study, the historical features of each sub-period, and the related characteristics of our dataset. In section III we present the main statistical features of our dataset, including the discussion of quasi-IPOs. We also present hypotheses about the macro-determinants of new listings. In section IV we undertake an analysis of IPO pricing and describe a model of underpricing. In section V we present the empirical results of simple regression models. Section VI concludes the article.

## I. Exchange foundation, governance, and development

### *I.1. Unregulated public offers, the ‘free market’, and the genesis of an organized market*

The birth of the ASE was doubtlessly conditioned by a dramatic precedent: a ferocious cycle of mania and panic that grew out of unregulated public offers of shares traded in an informal market in the early 1870s. The mania coincided with the first attempts at Greek industrialization,<sup>16</sup> focused on mining and metalworking shares primarily, but encompassed banking shares as well. This was a time of speculative frenzy in other European exchanges. The link of the Athenian transactions with those of Europe was forged through the activities of Greek ‘diaspora’ financiers, who, during the 1870s, were increasingly active in Athens, along with the Ottoman Empire and other European capitals.<sup>17</sup>

Citizens of the independent Kingdom of Greece thus had their first serious brush with a speculative bubble in 1873. The public offer that sparked the mania

<sup>16</sup> Agriantoni, *Oi aparches*.

<sup>17</sup> Syngros, *Hmerologio*.



involved shares in a company running the metal processing plant around the mine of Lavrion, a rich source of silver in ancient times. Rumours and reckless political rhetoric about endless riches led to spectacularly high prices, succeeded by rapid decline in early 1874.<sup>18</sup> The 'Lavreotika', as the events were called, would remain etched in collective memory. The inauguration of public offers of equity shares in Greece became an occasion of loss and social suspicion against financial tycoons. The social mistrust would influence both the decision to create an organized exchange and proceedings at that exchange for at least the early years of its operation.

The drama of the boom and bust of 1873–4 played out in an informal market that was operating in and around a popular Athenian coffee house. Share sales were conducted literally 'over the counter' in coffee shops, grocery stores, and merchant establishments. The organization of new issues, the pricing of the offers, and the details of distribution were managed primarily by the issuers and two newly founded merchant banks: the Credit Bank, established in 1872, and the Industrial Credit Bank, established in early 1873. The two banks had been launched by competing groups of recently arrived Greek 'diaspora' financiers and had also offered shares to the public.<sup>19</sup> Merchant banking was surely a significant innovation in the economy of Greece at the time. The prime mover of innovation was Andreas Syngros, a famous financier-tycoon who had made a fortune in the Ottoman Empire, trading commodities and Ottoman public bonds.

In the aftermath of the bust and the political outcry that ensued, the creation of an organized market was announced in 1876 with the publication of a royal decree that contained the first charter and a body of rudimentary rules of the Exchange. The rulebook would be revised in 1879 and actual operation would be inaugurated in 1880.<sup>20</sup> Operation has continued to this day, with several interruptions during wars and crises, of course, making the ASE the second longest-lived financial institution in the country.<sup>21</sup>

A landmark development that would change the course of the Greek market for capital had preceded the launch of the Exchange: the Greek state, embargoed for decades from international markets due to sovereign defaults in the 1830s, regained access to international borrowing.<sup>22</sup> This was a time in which the international markets for bonds were expanding, strong capital exports from the developed European economies were directed to the world periphery, and the role of exchanges was prominent in the process. In that context, the prospect of capital inflows to Greece hastened the inauguration of the organized Exchange as an official trading venue for government paper, company equities, or bonds.<sup>23</sup>

A remarkable aspect of the Exchange as a public market for securities is that its charter included no regulation of public offers of shares, nor was a public offer required for listing. The absence of such provision appears all the more conspicuous considering the traumatic events of 1873–4. The continuation of the unregulated

<sup>18</sup> The stock price of the Lavrion Metalworks went from 46 francs on 17 April 1873 to 156 francs on 1 May, declining to 74 francs a few months later. See Dertilis, *Tò zitima twn trapezwon*, app. VII.

<sup>19</sup> Dertilis, *Historia*, pp. 411–12; Platanopoulos, *Ekato xronia*, pp. 50–1.

<sup>20</sup> Athens Stock Exchange Organizational Charters 1876, 1879; see Platanopoulos, *Ekato xronia*, p. 37.

<sup>21</sup> The longest-lived financial institution is the National Bank of Greece which was founded in 1842.

<sup>22</sup> Dertilis, *Historia*.

<sup>23</sup> Bouvier, *Initiation*, pp. 251–4.

status of public offers testified to the power of issuers and financiers, especially at a time when Greece was reconnecting to the international financial market in which entrepreneurs belonging to the Greek diaspora were already active.

In our view, a policy that could encourage IPO growth would have been quality regulation of IPOs and especially mandatory disclosure rules. Such regulation already existed in more developed markets. In Greece, however, it was not forthcoming. This is puzzling, considering that regulation of both listing requirements and transaction rules was undertaken during the period. The Exchange was not a government operation. It was a self-regulated entity governed by its members.<sup>24</sup> It had basic rules of transaction and settlement, as well as minimum listing requirements. In its first bulletin, issued on 12 May 1880,<sup>25</sup> the 17 securities listed for trading included six government bonds, one corporate bond, and 10 company equities. As we document below, listings were far more numerous than IPOs. Most companies would acquire their first capital before listing by placement of shares among narrow groups or even a public offer. They would also engage in capital increases after listing. In following sections of the article, we will take a closer look at governance reforms and the analysis of listings and public offerings of private shares.

The inauguration of the Exchange did not subjugate legally (or in practice) the pre-existing 'free market' for shares, as the over-the-counter market was called in nineteenth-century Athens. The two coexisted and operated in parallel. Shares listed on the Exchange would trade in both markets, but of course many non-listed shares were also traded over the counter. In fact, it appears that the 'free market' was a lively one. In the early years, trading on the Exchange would last for up to three-quarters of an hour, but the 'free market' would continue. A contemporary newspaper reports that the more important transactions were conducted in the 'free market'.<sup>26</sup> In 1884 there was trading of 26 company shares (including a few foreign ones) in the 'free market', more than twice the number of shares listed on the Exchange. Some of the shares traded off-market would go on to become listed, having presumably proved their tradability.<sup>27</sup> It is notable that no foreign company issues were traded on the Exchange.

An early historian of the ASE wrote: 'This "free market" operated in the streets around the Stock Exchange. It functioned from morning till night, often to midnight. It was not organized. Some dealers had offices, others not. The trading customs followed those of the official Exchange. Guarantees and sureties required were, as a rule, lower than the normal ones'.<sup>28</sup> The 'free market' was to be officially sidelined by the grant of monopoly status to the Exchange in 1918; however, evidence of free market operations persists in press reports throughout the 1920s.

<sup>24</sup> The Organizational Charter published in 1879 appointed a five-member committee as the governing board. All five members were licensed brokers. See Platanopoulos, *Historia*, p. 37.

<sup>25</sup> Athens Stock Exchange, *Anaskopisi Xrimatistiriou Axion Athinon 1936*, p. 7.

<sup>26</sup> Anonymous, 'Athens Stock Exchange', *Ermis [Hermes]*, 4 April 1882, p. 2.

<sup>27</sup> *Ermis [Hermes]*, 15 April 1884, p. 12.

<sup>28</sup> Keramidas, *Xrimatistiria Axion*, pp. 43–4.

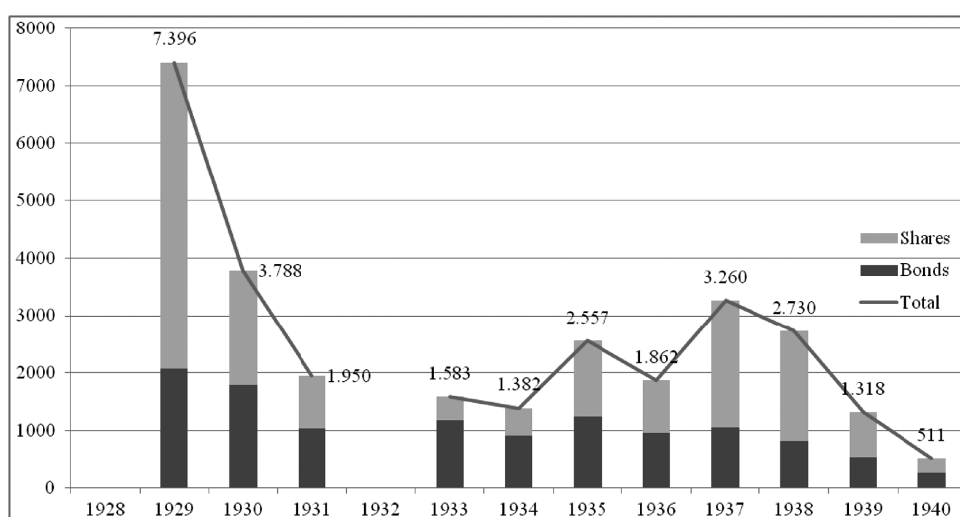


Figure 1. *Trading volume, 1929–40 (gold sovereigns)*

Source: See online app. S1.

### *I.2. The contours of stock exchange development*

In this section we present broad quantitative characteristics of the ASE, over the period examined, and its appearance in comparison to other contemporary markets. Our evidence is limited, as we have no systematic data on trading volumes and transactions, until the very last part of the period. Nevertheless, we have hand-calculated end-of-year estimates of capitalizations for selected years, which enable a comparative view. As mentioned in the previous section, during the first 40 years of the period a ‘free market’ was functioning outside the official Exchange, but so far we have discovered little reliable quantitative evidence of its activity. Thus, what we report here refers only to the official Exchange. We explain data sources and limitations in appendix I.

The creation of stock exchanges in the nineteenth century was often motivated by trading needs for government debt. The Greek case was no exception, since its organization coincided with the re-entry of Greece into the international bond market. It is therefore important to gauge the relative weight of private stocks as compared to public and private debt securities. In table 1 we present capitalizations for each category of security at the end of each decade from 1880 to 1930, all estimated in gold sovereigns.

The relative weight of shares as compared to government bonds is not negligible, varying from a low of about 18 per cent in 1900 to a high of 108 per cent in 1920. It is important to note that large changes in the capitalization of public debt are observed in periods when public borrowing had intensified, as was the case in the 1890s and the 1920s. (We comment on financial events in these periods in section II.) Although we have no evidence on trading volumes in the earlier periods, we can gain a glimpse of relative magnitudes in the period 1929–40, for which volume data are available, as shown in figure 1.



Table 1. Capitalization of listed shares and bonds on the ASE and number of securities for each asset category, 1880–1930 (calculated at the end of each decade)

| Year (end of decade, 31 Dec.) | Capitalization of government bonds (in gold sovereigns) | No. of government bonds | Capitalization of corporate bonds (in gold sovereigns) | No. of corporate bonds | Capitalization of shares (in gold sovereigns) | No. of listing shares |
|-------------------------------|---|-------------------------|--|------------------------|---|-----------------------|
| 1880                          | 6,775,925   | 8                       | 1,577,042  | 1                      | 3,379,715                                     | 10                    |
| 1890                          | 16,882,709  | 7                       | 2,981,906  | 1                      | 5,938,114                                     | 13                    |
| 1900                          | 26,697,662  | 9                       | 3,112,514  | 12                     | 4,924,628                                     | 20                    |
| 1910                          | 20,611,488  | 12                      | 5,941,822  | 14                     | 12,207,369                                    | 27                    |
| 1920                          | 18,510,309  | 18                      | 5,356,224  | 18                     | 20,216,870                                    | 45                    |
| 1930                          | 71,819,308  | 33                      | 2,483,051  | 18                     | 17,926,594                                    | 101                   |

Notes: This table presents descriptive statistics for governmental and corporate bonds on the ASE between 1880 and 1930.  
Source: 1880: ‘Athens Stock Exchange bulletin’, *Proia [Morning News]*, 31 Dec. 1880, p. 4; 1890: ‘Weekly stock exchange bulletin’, *Ernis [Hermes]*, 1 Jan. 1901, p. 8; 1910: ‘Athens stock bulletin’, *Economic Chronicles*, 2 Jan. 1911, p. 7; 1920: ‘Athens stock bulletin’, *Oikonomologos Athinon [Athens Economist]*, 30 Dec. 1920, p. 8; ‘Stock price movements’, *Oikonomikos Taxidromos [Economic Postman]*, 28 Dec. 1930, p. 6.

Table 2. *Comparative evolution of number of listed companies per million people*

| Country                       | No. of listed companies per million people |       |       | Stock market capitalization/GDP |      |      |
|-------------------------------|--|-------|-------|---------------------------------|------|------|
|                               | 1913                                       | 1929  | 1938  | 1913                            | 1929 | 1938 |
| Argentina                     | 15.29                                      |       |       | 0.17                            |      |      |
| Australia                     | 61.74                                      | 76.92 | 84.88 | 0.39                            | 0.5  | 0.91 |
| Austria                       | 38.72                                      | 42.62 | 30.06 | 0.76                            |      |      |
| Belgium                       | 108.7                                      |       |       | 0.99                            | 1.31 |      |
| Brazil                        | 12.43                                      | 9.85  | 5.17  | 0.25                            |      |      |
| Canada                        | 14.65                                      |       |       | 0.74                            |      | 1.00 |
| Chile                         | 20.62                                      |       |       | 0.17                            |      |      |
| Cuba                          | 12.69                                      |       |       | 2.19                            |      |      |
| Denmark                       | 38.22                                      | 54.86 | 85.25 | 0.36                            | 0.17 | 0.25 |
| Egypt                         | 16.58                                      | 13.44 |       | 1.09                            |      |      |
| France                        | 13.29                                      |       | 26.20 | 0.78                            |      | 0.19 |
| Germany                       | 27.96                                      | 19.73 | 10.91 | 0.44                            | 0.35 | 0.18 |
| India                         | 0.82                                       | 1.81  | 2.59  | 0.02                            | 0.07 | 0.07 |
| Italy                         | 6.32                                       | 6.40  | 3.11  | 0.17                            | 0.23 | 0.26 |
| Japan                         | 7.53                                       | 16.65 | 19.48 | 0.49                            | 1.20 | 1.81 |
| Netherlands                   | 65.87                                      | 95.48 |       | 0.56                            |      | 0.74 |
| Norway                        | 33.51                                      | 41.50 | 45.98 | 0.16                            | 0.22 | 0.18 |
| Russia                        | 2.02                                       |       |       | 0.18                            |      |      |
| South Africa                  |  |       |       | 0.22 <sup>a</sup>               |      |      |
| Spain                         |  |       |       | 0.31 <sup>a</sup>               |      |      |
| Sweden                        | 20.64                                      | 16.36 | 14.93 | 0.47                            | 0.41 | 0.30 |
| Switzerland                   | 61.53                                      | 67.80 | 55.46 | 0.58                            |      |      |
| Uruguay <sup>a</sup>          | 15.60 <sup>a</sup>                         |       |       | 0.16 <sup>a</sup>               |      |      |
| UK                            | 47.06                                      |       |       | 1.09                            | 1.38 | 1.14 |
| US                            | 4.75                                       | 9.72  | 9.16  | 0.39                            | 0.75 | 0.56 |
| Greece                        | 5.81                                       | 15.99 | 12.78 | 0.42                            | 0.21 | 0.14 |
| Common law ave. <sup>a</sup>  | 25.80                                      |       |       | 0.55                            |      |      |
| German civil law <sup>a</sup> | 33.94                                      |       |       | 0.73                            |      |      |
| French civil law <sup>a</sup> | 28.74                                      |       |       | 0.37                            |      |      |

*Notes and sources:* The number of listed companies per million people is the number of domestic companies whose equity is publicly traded in a domestic stock exchange divided by the population in millions. The data mainly come from Rajan and Zingales, 'Great reversals', tabs. 3 and 5 (pp. 15, 17), and complementarily from Musacchio and Turner, 'Law', tab. 1 (noted with *a*). Musacchio and Turner (ibid., tab. 1, pp. 531–2) also introduce some stock market capitalization index numbers in 1913 for some countries that differ from the findings of Rajan and Zingales; in particular, for the UK the given stock market capitalization index is 0.98, for the US 0.39, for Switzerland 1.23, for Brazil 0.20, for Cuba 0.33, for Egypt 0.44, for France 0.54, and for Denmark 0.86. O'Sullivan, 'Expansion', reports an average of 151 stocks traded on the New York Stock Exchange (NYSE) in 1885, 296 in 1900, 429 in 1915, 670 in 1920, 775 in 1925, and 1,273 in 1930. The great majority of them were industrial shares (1,033 out of 1,273 in 1930). O'Sullivan also underlines that in addition to the 151 companies that were listed on the NYSE by 1885 there have been 249 firms listed on the Boston Stock Exchange and 79 in Philadelphia; ibid., p. 512. Further, Moody's, *Manual of industrial*, app., p. 106, reported an aggregate market capitalization for the country's leading trading markets of \$81.97 billion at the end of 1930 (\$49 billion for the NYSE; \$20 billion for the Curb; and \$13 billion for the remaining exchanges) which suggests a ratio of 91% based on a \$90.4 billion figure for GDP for 1930.

Figure 1 shows clearly that trading volume for shares does surpass bond trading in some periods, notably in 1929, again as an indication that shares were by no means a negligible portion of Exchange activity. The fact that the Exchange quickly became a trading venue for private shares is significant as an indication that private sector activity was growing.

A second major question for which we gathered evidence is the comparative standing of the ASE relative to other contemporary exchanges. The starting point for a comparative view is to use widely accepted indices such as the ratio of capitalization to GDP and the number of listed firms per million inhabitants. In order to obtain as broad a comparison view as possible, we reproduce below parts

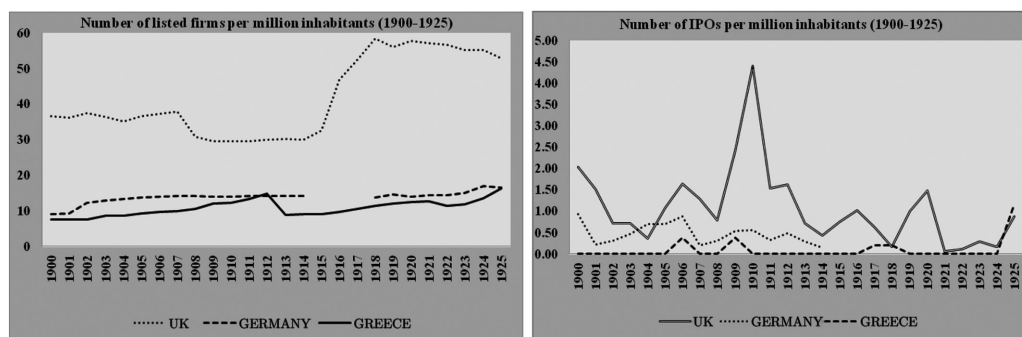


Figure 2. *Number of listings and IPOs per million inhabitants, 1900–25*

Source: Data provided in online apps. S1 and S2.

of two tables from Rajan and Zingales to which we add (as a last row) our estimates for Greece in the same years (table 2).<sup>29</sup> In the right panel we show metrics for capitalizations over GDP and on the left panel we show the number of listed firms per million people. Our estimates of capitalization in Greece include only equity shares.

The capitalization-to-GDP ratios—despite the reservations that have been voiced about their comparability—show that Greece was relatively high in 1913, comparable to the US and Germany, but went to a low level in 1938. Thus, at the peak of prewar globalization, the Greek Exchange appears to be within the European trend, but later experiences considerable decline, due both to the general reversion of globalization and to its own particular circumstances, as we shall presently explain.

Looking at the metric of listed firms per million inhabitants, we note that Greece remains at the low end of the comparative scale but shows clear growth between 1913 and 1929. In the latter year its metric is in fact comparable to that of Germany and Sweden. In the last year, 1938, the Greek ratio is somewhat lower than in 1929 but again remains comparable to that of Germany and Sweden. On the whole, it appears that the ASE was following a pattern similar to other European exchanges and that, at least in terms of listed firms, it developed a visible dynamic during the first decades of the twentieth century. This dynamic will be a central aspect of our inquiry in later sections of this article.

A more detailed comparison with the more developed exchanges of the UK and Germany can also be made, on the basis of published data, for the metrics of listed firms per million inhabitants and IPOs per million inhabitants. In figure 2 we show the comparative estimates for the period 1900–25 (online appendix S2 shows the detailed data).

The left side of the diagram confirms that the ASE was comparable to Berlin in terms of the density of listed firms, but both were much lower than London. On the right side of the diagram where IPO densities are compared, however, the

<sup>29</sup> These are extracted from Rajan and Zingales, 'Great reversals', tabs. 3 and 5, pp. 15–17, and complemented by more recent data in Musacchio and Turner, 'Law', p. 524. Greek data are calculated from hand-collected evidence on stock capitalizations and available sources for GDP and population, as per online app. S1.

ASE is located below the others throughout the period. Thus, the scarcity of IPO activity on the Greek Exchange, relative to what is observed in the more developed exchanges, is a basic observation which will be analysed in later sections. Possible factors that will be considered in later discussion are related to liquidity conditions, but also to questions of transparency and regulation of the quality of IPO activity.

### 1.3. *Exchange governance and its successive reforms*

From a governance standpoint, the Exchange remained a self-regulated organization until 1918, when a landmark law imposed government interventions.<sup>30</sup> Law 1308 of 1918 was inspired by analogous legislation of the 1890s and 1900s in civil law jurisdictions, mainly Germany, France, and Italy; its timing was clearly related to the occurrence of a very large stock exchange bubble in 1918 and the rapid increase in speculation that had followed the end of the war. The new law brought about an overhaul both of legal status and operating procedures. The Exchange became a public legal entity and was granted a monopoly on legal transactions of shares and bonds, following earlier French and German arrangements. Other provisions covered brokers' duties, clearing and settlement, and types of transactions, including cash, forward, option, and repos. The law additionally introduced, for the first time, penal sanctions for misinformation, fraud, and abuse of investors' trust.<sup>31</sup>

Law 1308 established direct government intervention in Exchange affairs; the government acquired major powers not only for oversight but also in decision making. An inspector's office was installed for supervision of the rules of trading, with the power to suspend Exchange operation for up to five days. An 'Exchange Council', separate from the Exchange's governing board, was constituted; its composition included public servants, bank representatives, and brokers, the latter being a minority. The Council wielded powers over policy, broker licensing, listings, and delistings (to which we return below). It was chaired by the Secretary General of the Ministry of Economy.<sup>32</sup> The Council represented severe curtailment in the power of brokers, removing from their control two decisions of strategic importance: broker licensing and securities listing.

Ten years later, a new law—Law 3632 of 1928—was passed, revising governance structures, rules, and operations.<sup>33</sup> As was true at the time of the Exchange's original founding in 1878, this was also a period of major change in financial architecture in Greece and in the country's adherence to international monetary arrangements. In May 1928, Greece established a new central bank, the Bank of Greece, which took over responsibility for monetary management; Greece committed to the gold exchange standard at the same time. The prospect of regaining full participation in the international monetary system and a new opening to the international economy provided the impetus for modernization of the Exchange.<sup>34</sup>

<sup>30</sup> Law 1308/1918 (Papadimos, *Silogi Xrimatistiriakwn nomon*).

<sup>31</sup> Law 1308/1918, arts. 33–4 (Papadimos, *Silogi Xrimatistiriakwn nomon*, pp. 36–7).

<sup>32</sup> Law 1308/1918, art. 3–5 (Papadimos, *Silogi Xrimatistiriakwn nomon*).

<sup>33</sup> Law 3632/1928 (Gounaropoulos, ed., *Oi kanones tou Xrimatistiriou*).

<sup>34</sup> The next landmark reform of the exchange would come in the 1990s, at the time of preparation for Greece's entry into the euro-zone.

The 1928 law clarified the responsibilities of the government inspector with regard to the governing board of the Exchange, which was made up of broker-members. Importantly, the Exchange Council that had been established in 1918 now assumed final decision-making powers in matters that had earlier required Ministerial or Cabinet approval. In that sense, the new legislation ‘depoliticized’ the decision process and allowed speedier decision making. In the same spirit, a special ‘Exchange Court’ was established which would rapidly adjudicate differences, claims, and frauds arising from transactions both among brokers and between brokers and clients.<sup>35</sup> The explicit justification for instituting this court was the need for speedy resolution of disputes, which was impossible to achieve in the regular courts.<sup>36</sup> The penal sanctions for market abuse came under the jurisdiction of the special court, and this improved speed of enforcement. The law rebalanced the governance, re-expanding Exchange autonomy in areas that had been relegated to government decision in 1918, such as licensing, listing, and brokers’ disputes.

A brokers’ Guarantee Fund, whose primary form had been already established in August 1923, was now fully organized as a collectively financed self-insurance fund for brokers. Its express purpose was to cover obligations to other brokers in case of a broker’s default, and to compensate investors. The Guarantee Fund has proved a stable arrangement that survives to this day.

The reform of 1928 sought to improve both the efficiency and the credibility of Exchange operation. The provisions for speedier enforcement of prohibitions of market abuse and of the compensation scheme for investor losses due to broker failures formed the first cohesive framework for investor protection in Greece.

#### I.4. *Listing requirements*

At the beginning of its operation the Exchange instituted and followed two basic listing conditions for shares of private companies. The first was very specific: at least one-third of the company capital had to be paid up. This ensured credibility for original owners, but was also an anti-speculative device against the sale of empty shells on the Exchange floor. It was not necessary to conduct a public offer of shares to obtain listing. There was, however, a second condition for listing: a general provision that shares must show potential for trading activity.<sup>37</sup> The determination of this potential was left to the governing board of the Exchange, based on evidence furnished by the candidate company. Besides papers certifying its legal status and some form of financial statements, tradability could logically be established on only two grounds: first, evidence of the actual dispersion of ownership before listing; and second, actual trading in the lively informal market which was in operation at least until the 1920s. It is highly probable that evidence of off-market trading was acceptable in the early years, since the ‘free market’ was legitimate until 1918, when the Exchange acquired the legal monopoly of transactions in shares.

A far-reaching innovation included in Law 1308 of 1918 was the change in listing requirements and procedures. As compared to the previous constraint of

<sup>35</sup> The Exchange Court was a mixed forum of one senior broker, public servants, and two judges; its jurisdiction included brokers’ and investor claims; see parliamentary introduction to Law 3632/1928 (Gounaropoulos, ed., *Oi kanones tou Xrimatistiriou*, p. 9).

<sup>36</sup> Ibid.

<sup>37</sup> Stock Exchange Organizational Charter (1879), art. 12 (Platanopoulos, *Ekato xronia*, p. 37).

a minimum percentage of paid-up capital,<sup>38</sup> the size of capital now became a prerequisite for listing. In addition, companies were required to have published at least two annual financial statements prior to the time of listing if their capital exceeded 2 million drachmas (80,580 gold sovereigns), and one set of annual financial accounts if their capital exceeded 5 million<sup>39</sup> (201,450 gold sovereigns). Thus, larger capital size was accepted as a criterion of quality. With regard to financial statements, the law made no mention of either accounting standards or audits. Nevertheless, the fact that financial reporting was elevated to a legal prerequisite for listing boosted the accounting process and the accounting profession.

The size criterion acted as a double-edged instrument: it encouraged large firms, even if they were newly formed ventures, to seek listing. The earlier requirement of evidence of tradability did not appear in Law 1308. It would be inconsistent for a law that instituted a legal monopoly of Exchange transactions to require evidence that implicitly admitted the function of the informal market.

The same Law of 1918 took the power of listing (and delisting) decisions away from the governing board of the Exchange, that is, the brokers. The Exchange Council (constituted as described in the previous section) assumed the responsibility of proposing listing for Ministerial approval. This represented a politicization of listings that would be severely criticized both in terms of slowness of process and as governmental meddling.<sup>40</sup> In the parliamentary proposal for this law, it was generally accepted that the government could assure the elimination of speculative excess.<sup>41</sup>

Ten years later, Law 3632 of 1928 again revised listing requirements for shares. The size of capital required for listing was raised to five million drachmas (13,427 gold sovereigns) and annual financial statements for at least three years prior to listing were mandated; however, companies whose capital exceeded 10 million (26,852 gold sovereigns) were allowed to present only one year's financial accounts. The increase in capital size was only nominal. In gold sovereign terms (see also online appendix S7), the change in required capital represented a substantial reduction in real terms. This accords with the evidence we present in section III.1 on the size of companies being listed on the ASE. In addition, candidate companies had to provide information about their shareholdings and their history of capital increases prior to listing.<sup>42</sup> Thus, evidence of dispersion of ownership and tradability made its way back on to the complement of listing requirements. Law 3632 of 1928 rebalanced the power of decision over listings. It vested the Exchange Council with decision-making authority for listings, abolishing direct ministerial power, but at the same time maintaining the limits on brokers' influence.

<sup>38</sup> Burhop, 'New stock issues', provides an interesting example from Berlin on the significance of paid up shares. Specifically between 1870 and 1884, the minimum face value of a share was 300 Marks and only 40% of it had to be paid up before the IPO. This means that the minimum investment to buy one share was 120 Marks. The 1884 corporate law increased the minimum face value of a share to 1,000 Marks and an IPO was only possible for fully paid-up shares.

<sup>39</sup> Law 1308/1918, art. 18 (Papadimos, *Silogi Xrimatistiriakwn nomon*, p. 74).

<sup>40</sup> See parliamentary introduction to the later Law 3632/1928 (Gounaropoulos, *Oi kanones tou Xrimatistiriou*, p. 9).

<sup>41</sup> Parliamentary introduction to Law 1308/1918 (Papadimos, *Silogi Xrimatistiriakwn nomon*).

<sup>42</sup> Law 3632/1928, art. 19 ((Papadimos, *Silogi Xrimatistiriakwn nomon*); see Keramidas, *Xrimatistiria Axion*, p. 36).



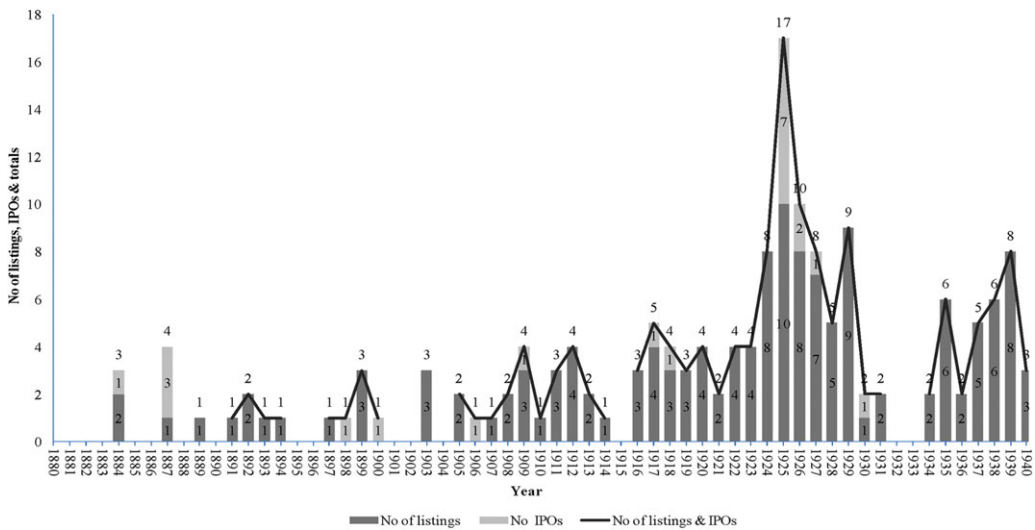


Figure 3. *Number of listings, number of IPOs, and total number of firms launched on the ASE, 1880–1940*

Sources: Historical Archives of National Bank of Greece and Athens Stock Exchange, Athens, *Official Daily Athens Stock Price Bulletins* (1880–1940), and *Athens Stock Exchange Yearbooks* (1911, 1926 and 1929–30).

The Council became a ‘listing authority’ that could act speedily and expertly on admissions to trading. It is worth repeating that, like its predecessors, this more sophisticated law included no explicit regulation of public offers of shares. The conduct of public offers continued to be unregulated until after the Second World War.

## II. Exchange listings and IPOs, 1880 to 1940: the impact of the environment

### II.1. *The comprehensive data*

Using archival data from the files of the ASE and the National Bank of Greece, press reports, and Exchange bulletins, we have put together table 3, which shows new listings and IPOs of equity shares in the years 1880–1940. In Figure 3 we show the number of listings and IPOs per year.

The data in figure 3 show two general characteristics. The first is that listings by far exceeded IPOs throughout the period. Over the 60 years (1880–1940) there are 165 new listings of companies and of those only 21 conducted concurrent IPOs. Thus, market development was primarily based on listings. Second, there is a strong movement of ebb and flow over the years in the process of listing. There are periods of little or no listing activity and other periods with a rapid pace of new listings. Finally, we note that 1925 is an ‘outlier year’ when both listings and IPOs were very numerous compared to the entire period. We will return to this in section V.

It is important to note that visible jumps in listing activity preceded the changes in listing requirements in 1918 and 1928. Both major legal changes in 1918

and 1928 occurred after episodes of rapid price increases that were followed by subsequent rapid declines. So legal changes occurred in the midst (or towards the end) of periods when listing activity was strong and continuous. Our basic observation is therefore that development was not led by legal change but rather by an autonomous demand for listings. Demand for listings was linked to economic conditions and expectations. In fact, the economic and political environment was in constant turmoil. Over the 60 years from 1880 to 1940, Greece was embroiled in two world wars, four local wars, and two sovereign bankruptcies. It also experienced remarkable periods of growth. It is impossible to gain an understanding of the movement of listings and IPOs without a broader history review, since shifts were not random but, to a large extent, historically conditioned.

Before embarking on the historical review, we must ponder the distinction between listing with and without a public offering of shares, as this is a dominant characteristic of the data in online appendix S2. The question is what incentive there was to list, if immediate access to external equity finance was not sought simultaneously. The question becomes even sharper if we recall that the Exchange was not a monopolistic trading venue but coexisted and competed with the 'free market' for more than half the period. If listing simply meant access to trading liquidity for company owners, the 'free market' was available and apparently quite active. So what would a firm gain by listing (but not raising capital concurrently) on the Exchange?

Two conjectures fit the qualitative evidence. First, the attainment of listing requirements was a reputational signal for the company being listed, since successful examination by Exchange authorities offered a type of 'certification', something that could not exist for the 'free market'.<sup>43</sup> Second, companies that obtained listing could exploit their new visibility to proceed to subsequent capital increases by secondary offers, after establishing a track record on the Exchange. This implies that listings were not 'stand-alone' decisions but part of a process at the end of which external equity capital was indeed raised.<sup>44</sup> Contemporaries also noted that listings at times of high inflation enabled inflation adjustment to company capital. Indeed, for a large portion of the period under study inflation was high. In any case, although listing was not contemporaneous to an offer of new shares, it could act as a precondition to one. In addition, the low liquidity in the overall economy must have also contributed to this result.

In this connection, the benefits of Exchange listing include the condition that access to the market trading facilitates subsequent funding, supports the creation of a market for the company's shares, boosts liquidity, and broadens the shareholder base.<sup>45</sup>

<sup>43</sup> The certification function is normally attributed to underwriters in the modern literature. In the context of the Greek market, no formal underwriting arrangements have been recorded. Listing and tradability of shares could also increase their value as collateral for borrowing from banks.

<sup>44</sup> See online app. S4 for data on capital increases that took place soon after listing. See also Derrien and Kecskés, 'Initial public offerings'.

<sup>45</sup> Flandreau and Flores, 'Bonds and brands'.

## II.2. *The period of rising globalization, 1880–1913*

Although Greek history has many turning points in the period of study, it is useful to follow an internationally accepted periodization. The period is divided into two parts using 1914, the year of the outbreak of the First World War, as a dividing point. The first period, 1880–1913, includes the years of rising globalization. The second period, 1914–40, includes the war years, postwar adjustment, and the crisis of the 1930s.<sup>46</sup> In this and the next section we provide a historical review of Greek developments, in order to underscore particular aspects that, beyond the international trends, conditioned the development of the Exchange, and more particularly listing activity.

The last 20 years of the nineteenth century witnessed a great cycle in Greek economic fortunes. In 1878, as stated earlier, Greece had regained access to international markets and a large inflow of borrowed funds occurred, giving a visible boost to liquidity, investment, and general economic activity. The 1880s saw the launch of major infrastructural projects, railroads, roads, and the Corinth Canal, leading to feverish construction activity. Several of these highly visible projects were included in the list of early IPOs conducted on the Exchange, as we shall see presently.

The increasing burden of public debt and the intensification of military spending, however, produced a fiscal crisis in the late 1880s. International lending also became much restricted after the Baring Crisis and the Argentine default in 1892. Greece followed, defaulting in 1893. In the ensuing years the drachma devalued substantially and import tariffs were imposed, eventually boosting domestic production and exports. However, war with Turkey broke out in 1897 with disastrous consequences: besides the demoralization of defeat, Greece undertook heavy reparation payments to Turkey. The country's public finances were placed under international financial control in 1898.<sup>47</sup>

In the years after the sovereign default, protection and devaluation had a positive impact on domestic production. The reflection of these movements is observable on the ASE and a changing composition of listings in the early years of the twentieth century.

New listings on the Exchange were quite numerous in the 1880s and the 1890s, with eight listings in the first decade and 10 in the second. The 1880s were chiefly characterized by the promotion of infrastructure investments and military production: of eight companies listed, three were railroads, two were construction firms, and one was a powder and explosives company. In the 1890s listings were more diversified, reflecting the acceleration of domestic production: listed companies were active in energy, shipping, textiles, and machine tools. Thus, we observe the first appearance of 'industrial stocks' on the Exchange. The largest company listed during this period was a bank, the Bank of Athens. In these two decades, and as compared to 15 new listings, there were five IPOs. They reflected the trends of the time: a munitions manufacturer, two railroad companies, a bank, and a company managing public land rents.

<sup>46</sup> O'Rourke and Williamson, *Globalization and history*; Berend, *Economic history*.

<sup>47</sup> International financial control (IFC) was established by the great powers of that time and was exercised by a Commission. See Dertilis, *Historia*, pp. 575–8; *Tychi* [*Fortune*], 1 May 1898 and 1 June 1898.

The years following international financial control of public finances represent one of the most turbulent periods in the country's economic history. Fiscal adjustment was gradually achieved and the drachma followed a path of revaluation in the early years of the new century, reaching parity with the golden franc and maintaining this parity until 1918. The balance of payments improved especially with the emergence of remittances from emigrants and shipping, which constituted a fresh source of domestic liquidity.<sup>48</sup> The country regained confidence with new and more technologically advanced firms making their appearance, and showing up in Exchange listings, as we discuss presently. Spearheaded by an officers' revolt in 1909, a new government promoted broad modernization in an open-economy context. It would be fair to characterize the first decade of the twentieth century as a period of peace and recovery, with fiscal and monetary stability. This would soon change, however.

With new confidence towards the Ottoman Empire, which was disintegrating, Greece went to war in 1912–13, and the victorious outcome saw a doubling of its territory to the north and the south (with the union of Crete) and a near-doubling of its population.<sup>49</sup> This signified a large extension of its internal market, a factor that would play a significant role in the ensuing period.

The ASE experienced a boom during this period, in the years 1904–6, when recovery and currency revaluation had entrenched themselves.<sup>50</sup> Leading sectors in the listings were banks, steamship companies, cement companies, and the first Greek electric utility. Steamship companies represented the most export-oriented sector of the time. Overall, the decade of stability (1900–10) saw the foundation of larger companies, undertaking new investments and seeking greater efficiency.

As a notable feature of quickened listing activity, new banks were systematically emerging. One factor was the large increase in inflows of foreign exchange in the form of remittances from recent Greek emigrants and from shipping. These provided a new source of private liquidity. Foreign private investments also made their appearance during the decade, directed especially to new banking ventures.<sup>51</sup> Arguably, the listing of banks was an indicator of the broader entrepreneurial climate in the Exchange and the economy. In 1900–13 there were 24 listings and only three IPOs. All three were conducted by new banks (the Bank of Crete, the Bank of Anatolia, and the Commercial Bank) and occurred before 1910.

### II.3. Wars, the 'roaring twenties', and world crisis: 1914–40

Greece joined the Entente in the First World War and obtained further territorial gains. The period of 1916–19 was, despite the war, one of economic optimism for the future of an enlarged nation. However, the war for Greece did not end in 1918. The country became embroiled in war with Turkey in Asia Minor in 1920, ending in defeat for Greece in 1922. That defeat brought another kind of expansion: almost one-and-a-half million of Asia Minor's Greeks were forced to

<sup>48</sup> See Repoulis, *Mia meleti*; Riginos, 'Conjoncture'.

<sup>49</sup> A distinct peculiarity of Greece as a nation state in the nineteenth century was that most ethnic Greeks lived outside its borders. Thus expansion was pursued as a goal of 'liberation' and national integration.

<sup>50</sup> *Oikonomika Chronika* (*Economic Chronicles*, newspaper, 1904–6). See online app. S7 on currency revaluation in the years 1900–10.

<sup>51</sup> Kostis, *Historia*.

move to Greece as refugees. This huge and sudden 'population shock' was initially debilitating and had dire fiscal consequences, as the country tried to cope with a huge resettlement effort. The 10 years of almost continuous war had, as expected, forced new fiscal imbalance, monetary financing of budgets, drachma devaluation, and inflation of the order of 8–55 per cent annually in the period after the war.

Inflation and domestic demand dominated the motives for company formations and listings in this period. Devaluation and trade protectionism boosted the emergence of enterprises that catered to the domestic market and this happened inevitably during the 10-year period of Greece's engagement in wars.

The 'population shock' of 1922 was experienced as a disaster by the uprooted but became a sort of growth engine for the economy. Asia Minor Greeks were skilled and enterprising, and they soon sought new ventures in their new home. Furthermore, public spending (including foreign aid) on refugee assistance expanded domestic demands for food, clothing, and housing. After the end of the wars, the pace of growth picked up; 1923–9 was a distinct episode of rapid development in recent Greek history. Inflation also continued, but was on the whole much lower than the earlier decade, averaging an annual rate of 13 per cent in the years 1924–7.<sup>52</sup> In 1928 Greece, under pressure from international donors, undertook monetary stabilization, pegged the drachma to the British pound sterling (which adhered to the gold exchange standard), and created a central bank, the Bank of Greece, to oversee and execute monetary policy.<sup>53</sup> Once again Greece became a full participant in the international monetary system, although the system itself proved short-lived.

The 1929 crash in the New York market ushered in a period of general financial crisis and depression. On 21 September 1931 the pound sterling went off the gold standard and the Greek government closed down the Exchange and all trading in foreign exchange. In April 1932, Greece itself abandoned the gold exchange standard and declared official default on its public debt. The Exchange did not reopen until December of that year. Following most advanced countries, once again Greece instituted protectionist measures. The crisis was not as harsh in Greece as in most advanced industrial economies. Under the protectionist regime, the economy picked up and local manufacturing was energized.<sup>54</sup> This moderate but upward economic trend would be finally interrupted with the eruption of the Second World War in 1939.<sup>55</sup>

In the 1920s, especially after 1924, the Exchange experienced another boom and an unprecedented record in new listings. In total 71 companies were admitted to trading in this period, of which most prominent were banking firms with 15 listings, textiles with 12, construction with 8, and chemicals and food each with 7 new listings. This listing activity represented about 50 per cent of all listings since the Exchange's inception and would not be encountered again until postwar booms occurred in the 1970s and the 1990s. In the ensuing decade of the 1930s, new listings would continue but at a much reduced pace, with 33 new admissions to trading, textile firms accounting for about one-third of that number. A very

<sup>52</sup> Riginos, 'Conjoncture'.

<sup>53</sup> Bank of Greece, *First fifty years*.

<sup>54</sup> Kostis, *Historia*.

<sup>55</sup> Bank of Greece, *First fifty years*.

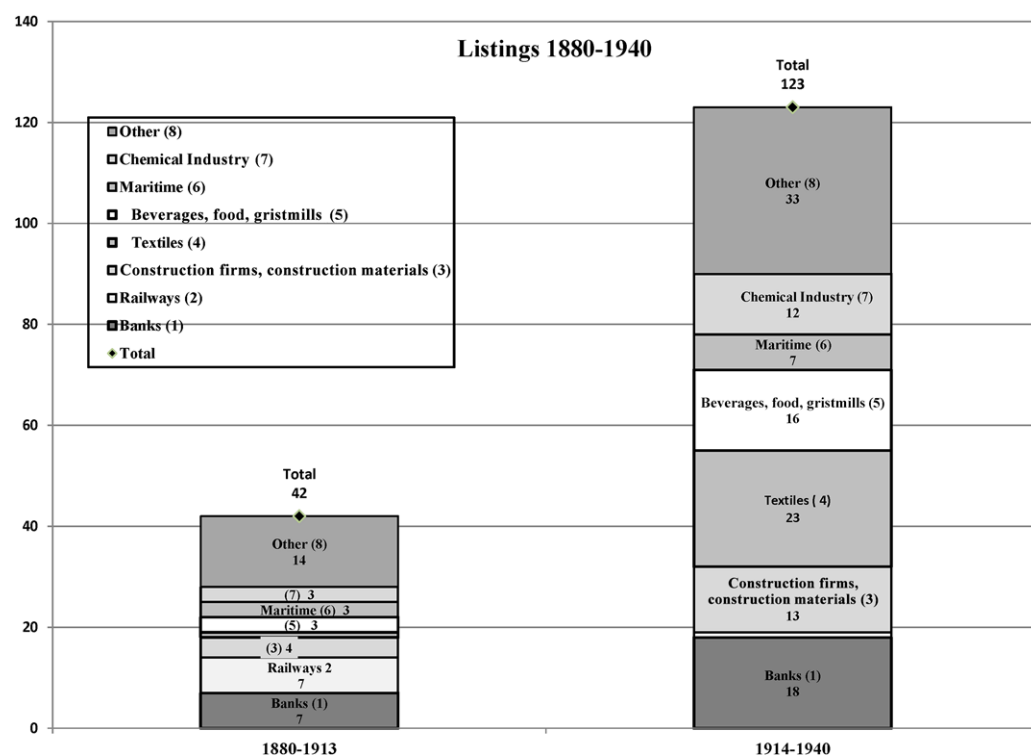


Figure 4. *Listings, 1880–1940: sectoral analysis during two sub-periods*

Source: See online app. S1.

interesting feature of the 1930s was that the financial stabilization of the late 1920s and the financial crisis of the 1930s led to the failure or merger of many of the new banks that had emerged during the boom of the 1920s.<sup>56</sup>

As compared to the record 104 new listings in this sub-period, 11 IPOs were conducted. All of those took place before 1930, when a long stoppage in IPO activity ensued, which lasted throughout the whole decade of the 1930s. Nine IPOs represented offers of manufacturing stocks, one of which was conducted by a construction company and one by the newly established central bank. This is the period of the clear rise in industrial finance through the Exchange. Aside from this significant shift, however, the number of IPOs as a proportion of total listings actually declined as compared to earlier periods.<sup>57</sup>

Figure 4 shows a comparison of listings and IPOs, along with their sectoral composition, in the two sub-periods. The large growth of listings in the second sub-period is accompanied by a visible increase in the sectoral diversification. This is mostly a diversification that encompassed the rise of manufacturing firms.

<sup>56</sup> We have recorded nine de-listings of banks in the 1930s.

<sup>57</sup> Although IPOs were sparse, capital needs were actually huge. Funding through the stock exchange during the 1920s took place in the form of capital increases conducted by companies that were already listed. This strengthens our conjecture that listing was sought as a precondition for later capital gathering through the sale of seasoned stocks.



#### II.4. *Hypotheses on new listings and Greek economic change*

Our general conjecture, that listing activity on the Exchange was conditioned by growth expectations and prospects, lends itself to statistical testing with plausible explanatory variables, available for Greece. We utilize new listings as a percentage of total listings (NLTL) as our dependent variable. The hypothesis about its determining factors is that indices of economic state and change affect listing activity.<sup>58</sup>

Available Greek data are gross domestic product (GDP) and population, the breakdown of GDP into primary, secondary, and tertiary sector outputs, and the rate of drachma devaluation; we compute per capita output (GDPpc), output growth rates (G1, G2, and G3) for the economy, the secondary (manufacturing), and the tertiary (service) sectors respectively; devaluation is estimated by the annual change in the exchange rate of the drachma to the gold sovereign.

Each of the three estimated variables represents economic conditions. Per capita GDP can proxy for disposable income and the potential demand for stocks; growth rates represent expansion of economic opportunities. The currency devaluation can proxy for prospects for the profit expansion of domestic manufactures. All three can potentially be positive drivers of new listings. We form a simple time-series model to test our hypothesis.

$$NLTL = c + \alpha (GDPpc) + \beta (DEV) + \gamma (G) + \varepsilon \quad (1)$$

According to the hypothesis  $\alpha, \beta, \gamma > (=) 0$ .

We explore the differentiation of this model across the two sub-periods. As we have already explained, in the first sub-period the Exchange was more open to international influences, but in the second it was inward-looking, with firms primarily oriented towards the internal market. As a consequence, we expect that domestic growth played a differential role in listing activity in the second sub-period, as compared to the earlier one.

The findings from the estimation of this regression are presented in section V.

### III. Listings and IPOs: frequency, size, and quasi-IPOs

In this section we present quantitative evidence on listings and IPOs, as they evolved over the 60 years under study. We address two related research questions. The first relates to the size and age of the firms admitted to listing. Did the Exchange evolve towards a trading venue for small and/or young firms, or did it remain the mainstay of established insiders? From a broader perspective, this is relevant to the contribution of the Exchange to enterprise development and economic change.

The second question relates to whether simple listings were actually ‘IPOs in waiting’, that is, listings that were quickly followed by a capital increase. The critical issues in this question are visibility and disclosure. If IPOs were rare because disclosure was inadequate, capital increases after listing could act as near-substitutes, after the firm had shown a track record on the Exchange. We collect data on all cases where a listing was followed, within a period of two years, by an issue of new shares. We consider these as ‘quasi-IPOs’ and compare them to

<sup>58</sup> Doidge, Karolyi, and Stulz, ‘US left behind?’, use GDP growth in a similar connection relating to IPO activity.

Table 3. *Descriptive statistics for listings and IPOs*

| Simple listings                  |             |                        | IPOs        |                        |                     |
|----------------------------------|-------------|------------------------|-------------|------------------------|---------------------|
| Panel A: whole period, 1880–1940 |             |                        |             |                        |                     |
| Variable                         | Age (years) | Size (gold sovereigns) | Age (years) | Size (gold sovereigns) | Given ownership (%) |
| Mean                             | 6.72        | 82,916                 | 6           | 166,061                | 38                  |
| Median                           | 3.5         | 34,578                 | 3           | 16,634                 | 33                  |
| No. of obs.                      | 144         | 144                    | 21          | 21                     | 21                  |
| Panel B: sub-period, 1880–1913   |             |                        |             |                        |                     |
| Variable                         | Age (years) | Size (gold sovereigns) | Age (years) | Size (gold sovereigns) | Given ownership (%) |
| Mean                             | 6.67        | 124,470                | 4           | 319,275                | 48                  |
| Median                           | 3           | 68,793                 | 4           | 201,401                | 35                  |
| No. of obs.                      | 34          | 34                     | 8           | 8                      | 8                   |
| Panel C: sub-period, 1914–40     |             |                        |             |                        |                     |
| Variable                         | Age (years) | Size (gold sovereigns) | Age (years) | Size (gold sovereigns) | Given ownership (%) |
| Mean                             | 6.79        | 70,188                 | 7           | 114,738                | 32                  |
| Median                           | 2.5         | 26,666                 | 3           | 27,723                 | 29                  |
| No. of obs.                      | 110         | 110                    | 13          | 13                     | 13                  |

*Notes:* This is a comparative table showing listings and IPOs. ‘Age’ is the age of the company in years from the date of its incorporation. ‘Size’ measures the no. of newly issued shares offered to the public during the IPO procedure multiplied by their offer price in gold sovereigns. For simple listings it is the nominal share value in gold sovereigns. Panel A presents the statistics for the entire period. In panel B we concentrate on the period of rising globalization (1880–1913) during which growth was realized through listings and IPOs of larger firms, mainly orientated towards infrastructure and banking. Panel C provides statistics for the period of de-globalization (1914–40), when the ASE developed an internal market orientation.

*Source:* Data provided in online apps. S3 and S5.

actual IPOs and their features. The inclusion of ‘quasi-IPOs’ offers a more accurate assessment of the role of the Exchange in the financing of firms, considering that pure IPOs may have been avoided due to the persistent lack of IPO regulation and mandatory disclosure.

### *III.1. The size and age of listed companies*

Given the multi-faceted economic conditions during the long 60 years that we have described, the examination of basic features acquires significance since it allows an evolutionary perspective. We saw that in the early decades there was emphasis on infrastructural projects, which were necessarily large, visible, and government-promoted. Manufacturing came later, and its growth was largely spurred by expanding domestic market potential. As the type and scale of undertakings by firms changed, we expect changes in size over time.

In the case of simple listings, we measure size by the nominal value of the stock at the time of listing. In the case of IPOs we measure the magnitude of the actual offer, defined as the number of shares offered times the offer price. Age is uniformly measured as the number of years between the founding of a company and the time of listing.

Table 3 shows the means of size and age for both simple listings and IPOs. In panel A, the estimates are shown for the whole period. In panels B and C, the estimates are shown for each sub-period.

We first note that the average size of IPO offerings exceeds by far the average size of firms that obtain simple listing. This is easy to interpret: IPOs were necessarily used when capital needs were high and could not be satisfied by recourse to narrow networks of capital providers or private resources of original owners. Thus, within the IPO dataset there are a few very large placements. Yet, as already noted, listings by far exceeded IPOs in number, the latter being a small minority. Looking at the sub-periods, we note that whereas in the early period 1880–1913, IPOs represented almost 20 per cent of all new listings, in the subsequent period the share of IPOs fell to about 11 per cent. We conclude that the growth of the primary market was stunted and did not keep pace with the general and considerable expansion of the market as a trading venue. This brings forth the importance of the quasi-IPOs that we take up in the next section.

The estimates in Panels B–C show a clear tendency for reduction in size over time, both for simple listings and IPOs. This is consistent with the conjecture that new sectors and smaller undertakings were gaining access to the Exchange over time. At the same time the average and especially the median age of listed firms were relatively low (three to five years) and did not show considerable change over time. Thus, we conclude that the Exchange was not the mainstay of established insiders, but a venue for trading shares of smaller and relatively young firms. This is not unexpected in a small and relatively young country in an early stage of development.

### *III.2. IPOs and quasi-IPOs*

We characterize as a quasi-IPO the case where a firm announces a capital increase soon after listing, offering the sale of new shares for cash. If the time of the capital increase is indeed close to that of listing, the strategy comes close to this being a delayed IPO, rather than a truly ‘seasoned’ offering. We must recall that in the Greek context underwriting was not a developed institutional arrangement with all the regulatory requirements of the present day. The primary sale of shares was unregulated and issuers were the main decision makers. Disclosure quality at the time of listing was probably low. The function of certification, which in the modern literature is attributed to underwriters, was vested in the seal of approval offered by the listing authority itself. Thus a quasi-IPO would benefit from both the certification of the listing decision and the acquisition of visibility through trading. Unfortunately, there is little or no evidence of trading activity, so it is not possible to distinguish firms which acquired a trading track record quickly after being listed. Instead, we have imposed a reasonable time limit of two years as a period during which some trading record is acquired, but in which the listing certification also retains validity as a reputational asset. Listed firms which engaged in capital increases within two years of listing are here considered as quasi-IPOs. Online appendix S4 includes a list of quasi-IPOs that took place over the period.

In table 4 and online appendices S4 and S5 we show descriptive statistics for quasi-IPOs and IPOs for the whole period and by sub-period. Size now describes the size of the offer in all cases. Data are classified by the date of listing, not by the date of ensuing capital increase in the case of quasi-IPOs.

Table 4. *Descriptive statistics for quasi-IPOs and IPOs*

| <i>Panel A: Comparison of quasi-IPOs with IPOs (whole period, 1880–1940)</i> |                    |                               |                    |                               |
|--|--------------------|-------------------------------|--------------------|-------------------------------|
| <i>Variable quasi-IPOs</i>   | <i>Quasi-IPOs</i>  |                               | <i>IPOs</i>        |                               |
|  | <i>Age (years)</i> | <i>Size (gold sovereigns)</i> | <i>Age (years)</i> | <i>Size (gold sovereigns)</i> |
| Mean   | 6.90               | 37,655                        | 6                  | 166,061                       |
| Median   | 3                  | 18,103                        | 3                  | 16,634                        |
| Min.   | 0                  | 542                           | 1                  | 1,697                         |
| Max.   | 64                 | 208,501                       | 46                 | 1,564,661                     |
| No. of obs.  | 42                 | 42                            | 21                 | 21                            |
| <i>Panel B: sub-period, 1880–1913</i>  |                    |                               |                    |                               |
| <i>Variable quasi-IPOs</i>   | <i>Quasi-IPOs</i>  |                               | <i>IPOs</i>        |                               |
|  | <i>Age (years)</i> | <i>Size (gold sovereigns)</i> | <i>Age (years)</i> | <i>Size (gold sovereigns)</i> |
| Mean   | 12.71              | 81,263                        | 4                  | 319,275                       |
| Median   | 3                  | 72,927                        | 4                  | 201,401                       |
| Min.   | 2                  | 44,515                        | 1                  | 60,445                        |
| Max.   | 64                 | 131,181                       | 11                 | 827,109                       |
| No. of obs.  | 6                  | 6                             | 8                  | 8                             |
| <i>Panel C: sub-period, 1914–40</i>  |                    |                               |                    |                               |
| <i>Variable quasi-IPOs</i>   | <i>Quasi-IPOs</i>  |                               | <i>IPOs</i>        |                               |
|  | <i>Age (years)</i> | <i>Size (gold sovereigns)</i> | <i>Age (years)</i> | <i>Size (gold sovereigns)</i> |
| Mean   | 5.74               | 30,387                        | 7                  | 114,738                       |
| Median   | 3                  | 16,111                        | 3                  | 27,723                        |
| Min.   | 0                  | 542                           | 1                  | 6,740                         |
| Max.   | 48                 | 208,501                       | 46                 | 1,066,666                     |
| No. of obs.  | 36                 | 36                            | 13                 | 13                            |

*Notes:* This table presents descriptive statistics for quasi-IPOs compared to IPOs. Quasi-IPOs or 'delayed' IPOs are those cases of listings where firms performed a capital increase, offering sale of new shares for cash, within two years of the listing date. 'Age' is the age of the company in years since the listing date. 'Size' counts the no. of newly issued shares offered to the public during the IPO or the right offering procedure multiplied by their offer price in gold sovereigns.

*Source:* Data provided in online apps. S4 and S5.

As shown in table 4, 42 quasi-IPOs were performed over the period, double the number of IPOs. However, total capital raised through these quasi-IPOs amounted to about 1.6 million gold sovereigns, less than half the aggregate amount raised by IPOs (3.5 million gold sovereigns). Thus, it appears that quasi-IPOs were chosen by smaller undertakings; these cases were probably more needful of the certification and the visibility provided by an Exchange listing before attempting to raise funds. The relation of IPOs and quasi-IPOs is strongly reversed over the two sub-periods, as we observe from panels B and C of the table 4. During the period 1880–1913, quasi-IPOs were fewer than IPOs and smaller in terms of capital raised. On the contrary, in the period 1914–40, quasi-IPOs were far more numerous than IPOs, and, although they represented smaller offerings on average, they led to about the same total capital absorption as IPOs. In an era when smaller and younger firms were admitted to listing, the implied usefulness of listing as a certification mechanism was clearly stronger. Thus, one conclusion is that smaller firms in particular used Exchange listing as a precondition for raising funds after having gained access to market trading. This implies that the supply of securities

in actual IPOs understated the true demand for capital by new firms and this demand became manifest shortly after listing, for smaller firms. Listing itself as a ‘certification’ signal facilitated the supply of new capital in an environment in which mandatory and uniform disclosure requirements were not enforced.

#### IV. Was there IPO underpricing on the Athens Stock Exchange?

##### *IV.1. Theoretical justifications*

The underpricing of primary offerings of securities has been extensively researched in modern markets, both developed and emerging.<sup>59</sup> The phenomenon of placements, where offer prices are systematically lower than subsequent trading prices, has drawn much attention, because it constitutes an anomaly within the framework of efficient markets. This anomaly has spurred a large amount of research, both in theory and history.

Theoretical explorations of underpricing have revolved around several basic themes. Ljungqvist has reviewed theories that focus either on the demand side or the supply side of primary markets: demand theories devolve on the asymmetry of information between issuers and external investors, on one hand, and behavioural factors summarized into the concept of ‘investor sentiment’, on the other.<sup>60</sup> Supply theories are underpinned by institutional factors (such as law, regulation, and financial practices) and/or strategic theories (for example, controlling the *ex post* shareholder base). Recognizing that regulation and institutional arrangements were absent in nineteenth-century Greece, we mostly draw on ideas from demand theories. Asymmetry may lead to an underpricing equilibrium in a market with uninformed investors. Investor sentiment presumes over-enthusiasm of buyers in the after-market of the offering. In fact, both aspects can be linked, since the appearance of sentiment is more likely when asymmetry of information is more acute.

Historical studies of large stock exchanges have also focused on IPO underpricing. Several studies in the nineteenth and twentieth centuries find that IPO underpricing varied over the long term. In fact, it appears to have been either absent or very small in magnitude in markets such as London and Berlin during the late nineteenth and early twentieth centuries. Numerous studies have noted that the increase in underpricing occurred over time in spite of improvements in regulation, disclosure, and the prestige of IPO underwriters.<sup>61</sup>

##### *IV.2. Pricing on the ASE*

The question in this section is whether underpricing actually occurred on the ASE during our period of study and if anything can be said about its determinants. In our case, the number of observed IPOs is limited to 21, and so small a population

<sup>59</sup> See Ritter, ‘“Hot issue” market’; Ljungqvist, ‘IPO underpricing’; Thomadakis et al., ‘“Collateral regulation”’.

<sup>60</sup> Ljungqvist, ‘IPO underpricing’, pp. 375–422.

<sup>61</sup> See Burhop, ‘Underpricing’; Chambers, ‘Gentlemanly capitalism revisited’; Lehmann, ‘Underwriter activity’; Chambers, ‘Going public’; Fohlin, ‘Asymmetric information’; Fohlin and Reinold, ‘Common stock returns’; Burhop et al., ‘Regulating IPOs’; Lehmann, ‘Taking firms’; Chambers and Dimson, ‘IPO underpricing over the very long run’.

can hardly support stringent statistical testing. We nevertheless marshal evidence from descriptive statistics, simple correlations, and qualitative observation.

In order to measure underpricing accurately, we compare the offer price of shares in each IPO with the shares' first trading price observed from daily press bulletins. Having no estimates of a market index on a daily basis, we have undertaken a market-return adjustment as follows: for each IPO we isolate two dates, the last day of the offer and the first day of trading. Further, we draw from the daily press all shares that traded on both dates and compute a simple average return of the portfolio composed of these shares. Thus, for each IPO we have a return for a matching portfolio with the same trading dates. We use this return as a proxy for 'market return' (MPR) and compute the market-adjusted individual return (MAIR) for each IPO as follows:

$$MAIR_i = \frac{CP_{i,1} - OP_{i,0}}{OP_{i,0}} - MPR_i \quad (2)$$

where,  $CP_{i,1}$  is the first observed trading price of the newly distributed shares of IPO<sub>*i*</sub>;  $OP_{i,0}$  is the offering price of IPO<sub>*i*</sub>; and  $MPR_i$  is the matching portfolio return for IPO<sub>*i*</sub>. In table 5 we present descriptive statistics of the computed MAIR.

In order to gauge possible determinants of underpricing, we examine popular proxies, found in empirical work with strong theoretical justification and measurable from our dataset. These include age and size<sup>62</sup> and the percentage of ownership held by pre-IPO owners. Size and age proxy for asymmetric information between issuer and investors (older and larger firms offer better information and are less underpriced). Monitoring incentives are taken to increase with the number of shares sold by the original owner at the time of the IPO. Ljungqvist and Wilhelm show that the lower the first-day returns, the greater are the monitoring incentives of the issuing firms' decision makers.<sup>63</sup>

Size is measured as the size of the offer, that is, the number of issued shares times the offer price. Offer prices are expressed in gold sovereigns throughout. The age of the company at the time of the public offering is measured by the difference in years between the date of establishment and the date of the public offering. Finally, given ownership (GO) measures the percentage of equity ownership offered to the public at the time of the offering.

From the estimates in table 5, it is apparent that, on average, underpricing is evident only in the second sub-period (1914–40), whereas in the early years it appears that offers were overpriced. It can also be seen from the table that in terms of possible explanatory variables, the average size of offerings exhibits a dramatic decline between the two sub-periods. We examine simple correlations between MAIR and the three possible explanatory variables by means of univariate regressions. The results are discussed in section V.

<sup>62</sup> See Ritter, "Hot issue" market'; Megginson and Weiss, 'Venture capitalist certification'; Ljungqvist and Wilhelm, 'IPO pricing'; Chambers and Dimson, 'IPO underpricing over the very long run'; Lehmann, 'Taking firms'.

<sup>63</sup> Ljungqvist and Wilhelm, 'IPO pricing'.



Table 5. *IPOs, first trading day IPO returns, size, and money left on the table, 1880–1940*

| Period <sup>a</sup>     | No. of IPOs <sup>b,c</sup> | Mean rate (%) of first trading day returns (RIR) | Mean market (%) adjusted returns <sup>d</sup> (MAIR) | Size (funds raised, in gold sovereigns) | Money left on the table (in gold sovereigns) |
|-------------------------|----------------------------|--|--|---|--|
| 1884                    | 1                          | -20  | -8.22  | 21,255                                  | 0  |
| 1887                    | 3                          | -38.12   | -39.16   | 2,383,941                               | 0  |
| 1898                    | 1                          | -34.4  | -39.16   | 40,000                                  | 0  |
| 1900                    | 1                          | -13.79   | -17.88   | 89,600                                  | 0  |
| 1906                    | 1                          | 1.307  | -0.072   | 223,357                                 | 0  |
| 1909                    | 1                          | 0.1  | 2.89   | 29,795                                  | 0  |
| 1917                    | 1                          | 30   | 26.64  | 8,943                                   | 2,682  |
| 1918                    | 1                          | 7.69   | -0.107   | 50,363                                  | 3,872  |
| 1925                    | 7                          | 331.42   | 301.89   | 77,636                                  | 282,299                                      |
| 1926                    | 2                          | 45.45  | 42.22  | 5,530                                   | 2,680  |
| 1927                    | 1                          | 160  | 156.29   | 7,997                                   | 12,795                                       |
| 1930                    | 1                          | 52   | 75.57  | 537,115                                 | 279,300                                      |
| Sub-period, 1880–1913   | 8                          | -20.15   | -22.49   | 2,787,948                               | 0  |
| Sub-period, 1914–40     | 13                         | 204.66   | 188.54   | 687,584                                 | 583,628                                      |
| Whole period, 1880–1940 | 21                         | 119.01   | 108.34   | 3,475,532                               | 583,628                                      |

Notes: <sup>a</sup>No IPO took place in years not included in the table.

<sup>b</sup>The annual distribution of the new issues of common stocks in this table was determined by the date of the firm's entrance to the ASE, rather than the time of public offerings.

<sup>c</sup>The IPOs only concern listings of common stocks on the Greek stock market.

<sup>d</sup>The mean first trading day IPO returns adjusted with the returns of all other listed companies in the ASE.

The observed first trading day. Raw returns for IPOs are the difference between the offer (or listing) price and the closing price on the first day of trading and are equally weighted (EW). Market-adjusted returns are raw returns adjusted by the returns of matching portfolios. Funds raised and money left on the table are in gold sovereign prices. The amount of money left on the table by IPOs is defined as the difference (when positive) between the closing price on the first day and the listing price, multiplied by the number of shares sold to the public (new investors). In other words, this is the profit received by investors who were allocated IPO shares at the offer price, at first trading. It represents a wealth transfer from the shareholders of the issuing firm to these investors.

## V. Empirical analysis

In this section we present the empirical results of estimations undertaken on earlier hypotheses regarding new listings and IPO underpricing. Table 6 shows the estimation of regression (3) on the determination of new listings, which is repeated here for clarity.

$$NLTL = c + \alpha (GDPpc) + \beta (DEV) + \gamma (G) + \varepsilon \quad (3)$$

We conduct the estimation of (1) using alternately G1, G2, and G3 (growth rates of overall GDP and of the secondary and tertiary sectors, respectively) as the growth factor. We also estimate the same regressions separately for the two sub-periods. In table 6 we show the result of the estimations.<sup>64</sup>

These results indicate that when the whole period is examined, there is no strong explanatory factor on new listings. GDP growth appears as a positive determinant in one of the regressions, and the rate of devaluation appears as a weak negative determinant. Looking at sub-period estimations, however, we note a substantial difference between the earlier and later sub-period. In the first sub-period, no independent variable is significant. In the second sub-period, however, growth rates exhibit significance, especially the growth rate of manufacturing, which emerges as the more positive and significant factor. This provides statistical confirmation of our qualitative conjecture that, in the second sub-period, exchange development was energized by the expansion of Greece's internal market.

The next set of estimations is a series of correlations represented as univariate bootstrapped regressions. The small size of the population of IPOs remains of course a barrier to statistical testing of higher stringency (for example, multiple cross-sectional regression), but our goal is to gather as many indications as possible from this admittedly small set of observations.

The following univariate bootstrapped regressions are estimated:

$$MAIR = A_1 + \beta_1 \ln(SIZE) + e_1 \quad (4a)$$

$$MAIR = A_2 + \beta_2 \ln(1 + AGE) + e_2 \quad (4b)$$

$$MAIR = A_3 + \beta_3 GO + e_3 \quad (4c)$$

Coefficient estimates for  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  show the correlation of each variable to MAIR. Although general conclusions cannot be drawn about the determinants of MAIR from univariate regressions, we can at least gauge if the direction of the correlation accords with extant theory and empirical evidence. Table 6 exhibits these results.

The only observation of significance in table 7 is that the size of an IPO correlates negatively with estimated MAIR. This is in line with a long list of findings in the literature and accords with the view that larger size (and visibility) signifies

<sup>64</sup> As there are anomalies in the time series due to zero new listings in some years, we have used the technique of 'bootstrapping' to enhance the quality of estimation. This method makes use of the empirical distribution function to derive an 'approximating distribution' of the observed data. This can be implemented by constructing a number of resamples with replacement of the observed dataset (and of equal size to the observed dataset); Fox, *Applied regression analysis*.

Table 6. *New listings on the ASE and economic growth (dependent variable: new listings as % of total listings)*

| <i>Panel A: whole period, 1880–1940</i> |                        |                         |                        |                        |                        |                         |
|---|------------------------|-------------------------|------------------------|------------------------|------------------------|-------------------------|
| Constant                                | 0.0818***<br>(0.00004) | 0.0830***<br>(0.000081) | 0.0839***<br>(0.00002) | 0.0862***<br>(0.00001) | 0.0843***<br>(0.00004) | 0.0882***<br>(0.00003)  |
| GDPpc                                   | 0.000247<br>(0.712)    | 0.00002<br>(0.970)      | 0.00013<br>(0.875)     |                        |                        |                         |
| DEV                                     |                        |                         |                        | −0.0002*<br>(0.0709)   | −0.000062<br>(0.734)   | −0.0002<br>(0.155)      |
| G1                                      | 0.0001<br>(0.661)      |                         |                        | 0.0002<br>(0.348)      |                        |                         |
| G2                                      |                        | 0.0005**<br>(0.011)     |                        |                        | 0.0005**<br>(0.0354)   |                         |
| G3                                      |                        |                         | 0.0001<br>(0.392)      |                        |                        | 0.0001<br>(0.211)       |
| Obs.                                    | 42                     | 42                      | 42                     | 42                     | 42                     | 42                      |
| Adj. R <sup>2</sup>                     | 0.046                  | 0.061                   | 0.043                  | 0.052                  | 0.053                  | 0.02                    |
| <i>Panel B: sub-period, 1880–1913</i>   |                        |                         |                        |                        |                        |                         |
| Constant                                | 0.0581<br>(0.163)      | 0.0576*<br>(0.0868)     | 0.0587*<br>(0.0845)    | 0.0981***<br>(0.00005) | 0.0884***<br>(0.00001) | 0.0986***<br>(0.000013) |
| GDPpc                                   |                        |                         |                        | −0.000350<br>(0.797)   | 0.000858<br>(0.637)    | 0.000202<br>(0.914)     |
| DEV                                     | 0.00544<br>(0.327)     | 0.00444<br>(0.325)      | 0.00528<br>(0.192)     |                        |                        |                         |
| G1                                      | −0.00005<br>(0.961)    |                         |                        | 0.0007<br>(0.418)      |                        |                         |
| G2                                      |                        | 0.00101<br>(0.508)      |                        |                        | 0.001<br>(0.362)       |                         |
| G3                                      |                        |                         | 0.000098<br>(0.923)    |                        |                        | 0.0002<br>(0.866)       |
| Obs.                                    | 18                     | 18                      | 18                     | 18                     | 18                     | 18                      |
| Adj. R <sup>2</sup>                     | 0.079                  | 0.041                   | 0.079                  | 0.126                  | 0.078                  | 0.141                   |
| <i>Panel C: sub-period, 1914–40</i>     |                        |                         |                        |                        |                        |                         |
| Constant                                | 0.055***<br>(0.001)    | 0.062***<br>(0.0005)    | 0.060***<br>(0.001)    | 0.0696***<br>(0.00003) | 0.0736***<br>(0.00005) | 0.0775***<br>(0.00002)  |
| GDPpc                                   | 0.0009<br>(0.119)      | 0.0008<br>(0.203)       | 0.001<br>(0.248)       |                        |                        |                         |
| DEV                                     |                        |                         |                        | −0.000162<br>(0.242)   | 0.000041<br>(0.828)    | −0.0001<br>(0.482)      |
| G1                                      | 0.000432<br>(0.142)    |                         |                        | 0.0005*<br>(0.072)     |                        |                         |
| G2                                      |                        | 0.000431*<br>(0.079)    |                        |                        | 0.0005**<br>(0.048)    |                         |
| G3                                      |                        |                         | 0.000064<br>(0.664)    |                        |                        | 0.0001*<br>(0.097)      |
| Obs.                                    | 24                     | 24                      | 24                     | 24                     | 24                     | 24                      |
| Adj. R <sup>2</sup>                     | 0.060                  | 0.024                   | 0.032                  | 0.050                  | 0.042                  | 0.052                   |

*Notes:* This table reports the results of multiple regressions using economic variables over the period 1884–1940 by employing the bootstrapping method. This constructs a number of resamples with replacement of the observed dataset. The dependent variable NLTL is new listings as % of total listings. GDPpc is the gross domestic product per capita. DEV is the devaluation rate. G1 is the growth rate of GDP. G2 is the rate of growth of the secondary sector (manufacturing). G3 is the rate of growth of the tertiary sector (services). \*\*\*Significant at the 1% level. \*\*Significant at the 5% level. \*Significant at the 10% level.

Table 7. *Results of univariate regressions for IPOs, 1880–1940 (market-adjusted initial returns)*

| <i>Variables</i>    | <i>MAIR</i>         | <i>MAIR</i>        | <i>MAIR</i>      |
|---------------------|---------------------|--------------------|------------------|
| Constant            | 0.854***<br>(0.000) | 551.30*<br>(0.054) | 44.48<br>(0.598) |
| Age                 | 7.606<br>(0.31)     |                    |                  |
| Size                |                     | −45.88*<br>(0.082) |                  |
| GO                  |                     |                    | −0.29<br>(0.775) |
| Obs.                | 21                  | 21                 | 21               |
| Adj. R <sup>2</sup> | 0.129               | 0.249              | 0.008            |

*Notes:* This table reports the results of univariate regressions using the dataset of IPOs launched on the ASE in the period 1880–1940. The dependent variable is  $MAIR = (EP_{i,t} - OP_{i,0})/OP_{i,0} - MPR_t$ , the IPO returns adjusted with the corresponding returns of all other listed companies on the ASE that traded on the relevant days. The independent variables are ‘Age’, defined as the log of one plus the age of the company in years on the listing date, and ‘Size’, which is the number of new issued shares offered to the public during the IPO, multiplied by their offer price (measured by the natural logarithm). GO identifies the % of ownership offered by listing firms to new shareholders in the IPO. The estimation results have employed the bootstrapping method. \*\*\*Significant at the 1% level. \*\*Significant at the 5% level. \*Significant at the 10% level.

lower information asymmetry. However, neither age nor the percentage of given ownership exhibit strong correlation with MAIR, so no indications can be gauged about these popular proxies.

Looking more closely into the composition of the data (table 4 and table 5), we note a striking concentration of IPOs in the year 1925. Seven IPOs (a third of the total number over the period) were conducted in that year. The average size of these IPOs was 11,090 gold sovereigns. Their average underpricing is estimated at 301.89 per cent, a level not found at any other time within our study period. Simple listings attained their maximum number in the same year, in which stock prices also peaked. It thus appears that 1925 was a very special year that affords a rare glimpse into a ‘hot period’ for the ASE and Greek conditions of liquidity. In our dataset, 1925 was the first year of IPO activity after a long pause. The last IPO had taken place seven years earlier, in 1918. Independent research into Greek fiscal and monetary conditions of the time indicates that the ‘hot listing period’ was very probably connected with macroeconomic factors. The year 1922 was the critical year of Greek defeat and the Asia Minor refugee crisis. Historical research indicates that the post-1922 period was one of monetary expansion and inflation that led to decreases in both the real wage and the real interest rate, thus enabling higher profitability.<sup>65</sup> Increasing profitability is repeatedly mentioned in contemporary press reports as a cause of the IPO boom of 1925.<sup>66</sup>

Furthermore, 1926 marked a sharp turn (also mentioned in the contemporary press) towards restrictive monetary and fiscal policies. As Christodoulaki notes, ‘The timing of this change in economic performance is located in late 1925 and early 1926 when pressure to improve the fiscal performance of the government and to follow contractionary monetary policies in order to stabilize the *drachma*

<sup>65</sup> Christodoulaki, ‘Industrial growth’, p. 80.

<sup>66</sup> *Oikonomologos [Economist]*, 23 Oct. 1926.

was increased'.<sup>67</sup> The peak in IPO activity observed in 1925 could be therefore attributed to a confluence of factors: long pent up demand, high stock market valuations, and expansionary monetary and fiscal policy. It is indicative that within those conditions it was mostly small firms oriented to the domestic market that sought and gained admission to market for capital-raising. As compared to the early large IPOs of the nineteenth century, this represented a true reversal in primary market direction.

## VI. Concluding remarks

The development of the ASE from its inception (1880) to the outbreak of the Second World War (1940) was an active process that took various turns as Greek economic events passed through episodes of growth, sovereign bankruptcy, war, and expansion. An important milestone for the character of the Exchange was the end of the era of globalization in 1913. The Exchange evolved from a trading venue for government paper and equities of large infrastructural government-sponsored projects to a market offering access to small manufacturing firms pursuing indigenous ventures in mostly consumer goods and construction. Thus, the Exchange underwent 'democratization' from elite large projects to grass-roots private initiatives.

Over the period, the Exchange accepted 165 new equity listings, besides the mandatory listing of government bonds. The stock market experienced several 'hot periods' of listing activity and peaking prices. In the first three decades of its operation as a trading venue, the Exchange competed with a free market that operated informally alongside the official Exchange. The fact that listing activity was robust even under the competition of a 'free' market testifies to the value of exchange listing as a type of certification that added value and visibility to listed entities.

The Exchange's role as a *primary* market for capital raising through IPOs was limited, however. Only 13 per cent of the firms that attained listing over this long period actually performed IPOs. Another 25 per cent chose to increase their capital by public offers within two years of acquiring listed status. The low level of IPO activity may have been due initially to the traumatic effects of an IPO bubble in the 1870s, before a formal Exchange had been organized. However, even when the effects of the early bubble became a distant memory, IPO activity still remained sparse. This may have been the result of insufficient liquidity in an emerging economy, but was also related in our view to the lack of regulation, especially adequate provisions for disclosure and IPO quality that could have inspired trust in investors.

Focusing on the parallel activity of quasi-IPOs (capital raising performed within two years of listing), we found that these were more widely used than IPOs, especially in the 1920s, which suggests this was a less costly route for capital gathering. The difference between IPOs and quasi-IPOs was that the latter had already obtained the stamp of approval of the listing authority and had established a trading record. Hence, whereas the same amount of capital raised in an IPO or

<sup>67</sup> Christodoulaki, 'Industrial growth', p. 80.

a quasi-IPO made the same demands on liquidity, quasi-IPOs offered differential levels of information about the issuer and apparently met with different levels of investor trust. This was very important, given the small size and the character of firms attempting to raise capital in the post-globalization era.

It is notable that despite several public interventions in the early twentieth century in the governance structure of the Exchange, IPOs remained unregulated, investment banking services were not standardized, and the quality of disclosure was low and uneven. This is probably the longer-term explanation for the relative weakness of the primary market. It must be clarified that there was no general absence of regulatory activity. Significant regulatory changes did take place from 1918 to 1928, but they were focused on listing requirements, secondary trading, and the duties of brokers, rather than IPOs and investment banking.

Examining the dataset of 21 IPOs undertaken over the period 1880–1940, we note a significant change in character and composition in these as well. Whereas banking IPOs appeared throughout the period, non-financial issues shifted from infrastructure-related projects and few heavy industry undertakings to light manufacturing ventures mainly oriented to the satisfaction of domestic demand. A notable reduction in the average size over time and a visible shift to severe underpricing of IPOs around the second decade of the twentieth century are evident trends. Analysis of pricing revealed that reductions in size, increases in market liquidity, and the occurrence of ‘hot market’ pressure were proximate causes of the emergence of underpricing.

In a more general historical assessment, it appears that the ASE showed distinct features during the two sub-periods of this study. It grew in both sub-periods. In the period of rising globalization (1880–1913), the growth was realized through listings and IPOs of larger firms mainly oriented to infrastructure and banking, as already stated. In the period of deglobalization that started with the First World War, and during which Greece experienced considerable growth of space and population, the Exchange developed with a clear orientation to the internal market: small and light manufacturing firms, smaller banks, and construction. Thus, the Exchange responded to the major features of economic development in Greece. The large expansion of the domestic market offered renewed impetus for listing activity by firms catering to that domestic market. This was also a response to protracted war conditions that engendered a *de facto* protectionism.

The second aspect of change in the post-First World War and national wars period was the emergence of inflation and monetary instabilities. Our evidence shows a large increase in listing activity and IPOs in the 1920s, at a time when inflationary profits were making an appearance. These phenomena would come to an abrupt stop when restrictive policies were enacted from 1926 onwards. Thus, indirectly, it appears that the abundance of monetary liquidity gave a boost to the Exchange, both as a primary market and as a listing venue. This is clearly consistent with our evidence.

Finally, it is important to note that we have found evidence that listing activity was statistically related to growth rates of the secondary (industrial) sector in the second sub-period, that is, the period of internal market expansion. This is a significant finding, especially in conjunction with the clear tendency for small firms to list on the Exchange in the second and third decades of the twentieth century. The clear implication is that the Exchange became and remained an important venue



for providing trading liquidity, and eventually finance, to emerging firms, until the outbreak of the Second World War.

Date submitted

29 July 2014

Revised version submitted

13 January 2016

Accepted

30 March 2016

DOI: 10.1111/ehr.12381

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## Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

**Appendix S1.** Data sources

**Appendix S2.** Evolution of number of listed companies per million people in London, Berlin, and Athens stock exchanges

**Appendix S3.** Number of listings, number of IPOs, and mean prices (trading, listing, offer)

**Appendix S4.** List of quasi-IPOs

**Appendix S5.** List of IPOs

**Appendix S6.** Previous literature on historical IPOs

**Appendix S7.** Parity of gold sovereign–drachma in the 1880–1940 period