IPOs: Insights from Seven European Countries

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ABSTRACT

We perform a comparative country-by-country study of companies going public in the six largest Continental European markets and Sweden during 1988 and 1998, a time period characterized by IPO activity in a broad set of industries. By applying a common research methodology, we find broad similarity in the overall and cross-sectional initial pricing and long-run performance patterns. Positive long-run IPO performance is a function of a countries' ability to attract "New Economy" IPOs. This helps to shed some light on the rational behind the frantic efforts made be individual European Stock Exchanges to establish "New Market" segments during the late 1990s.

IN RECENT YEARS, A LARGE BODY OF LITERATURE has documented the returns on Initial Public Offerings (IPOs) earned by investors in Europe. For example, using a sample of 712 UK IPOs between 1985 and 1992, Espenlaub, Gregory and Tonks (1998) find that there are negative abnormal returns to a number of alternative benchmark portfolios. They conclude that there are negative abnormal returns from an IPO such that a one-pound investment is worth less than 85 pence after three years. Leleux and Muzyka (1998) analyse the performance of 307 IPOs in France, the UK, Germany, The Netherlands and Belgium, issued between 1987 and 1993. The authors find that European IPO shares exhibit the pattern of long-term underperformance highlighted in the US. Summarizing evidence from a large number of countries, Loughran, Ritter and Rydqvist (1994) report that underpricing, "hot issue" markets and long-run underperformance are global IPO phenomena.

The evidence on IPO performance can also be addressed in a more general context of "Why do companies go public?" In this respect, Ellingsen and Rydqvist (1997) argue that companies tend to emphasize the following reasons for going public: (1) to obtain finance for growth opportunities, (2) to enhance a company's image and increase its publicity,[1] (3) to motivate managers and other employees, and (4) to "cash in" by selling off the financial interest in the company. However, the more fundamental question is why firms go public to achieve these goals. For example, direct sales of stock and bank financing are alternative sources of funds that could potentially finance new projects or allow for transfer of ownership. Moreover, funds raised through stock market introduction are often very expensive. It is generally perceived that the total cost

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[1] When asked about the reasons for raising funds on the stock market, Nick Ogden, founder of Ogden, an UK-based Internet company, said the flotation "will be as much about raising our profile as raising money". (Source: Sunday Business, March 12th 2000).

of going public lies between 20 cents and 30 cents per dollar, depending on the size of the firm. The only reasonable explanation for the initial offer is that there are some further future benefits associated with going public that outweigh the high cost of doing so. In this context, Röell (1996) concludes that the reasons why firms pursue an IPO are due to "an informative stock price, a more liquid stock, and increased competition among providers of finance".

Our objective in this paper is to extend the evidence on IPOs by applying a common empirical research framework to companies that went public between 1988 and 1998 in the following seven individual European Countries: Germany, France, Italy, The Netherlands, Spain, Sweden and Switzerland. This period is of considerable importance as it begins with the aftermath of the 1987 stock market crash, followed by large privatization programmes and eventually by a big boom in European equity culture and issuing activity towards the late 1990s. These individual markets provide a unique opportunity to examine the robustness of findings on the performance of UK and US IPOs within the setting of other market-based financial systems, in which stock markets play an increasingly crucial role in company financing. Moreover, by extending our analysis of the European IPO market by studying each country individually, we can improve our understanding about the robustness of the IPO patterns reported in the literature and the homogeneity of the European IPO market.

Some of our findings include the following:

(1) The underpricing phenomenon, while time-varying, is a consistent feature across all the countries in the study. There is tentative evidence to suggest that changes in tax regimes (in the case of Sweden and France), the regulatory framework (in the case of Spain) or the IPO mechanism (in the case of France) have had a significant impact on pricing and IPO activity. The results for the long-run performance of IPOs in individual European countries indicate that long-run underperformance is a time-varying phenomenon and sensitive to measurement technique and benchmark adjustment.

(2) Throughout the sample period, there appears to be a clearly positive link between the degree of a countries' involvement in New Economy IPO activity and long-run IPO performance. While IPOs in Germany, The Netherlands or Sweden perform relatively well over the long-run, IPOs in countries with no New Economy IPO activity, such as Italy and Spain, fared worse. This can help to shed some light on the rationale behind major efforts made by stock exchanges across Europe to establish "New Market" segments during the 1990s.

(3) When performing significance tests of performance differences between the individual countries, the results, for overall and cross-sectional patterns, confirm similar initial and aftermarket performance of IPOs for each European country. This underlines the homogeneity of the European IPO market in general and the pervasiveness of the observed IPO patterns in particular.

The structure of this study is as follows: Section I describes the institutional arrangements for IPOs in the seven countries under study and reviews the existing empirical literature. In Section II, we describe the data and methodology. Section III presents evidence regarding aftermarket performance and reports cross-sectional patterns in the performance of IPOs in the seven European countries. In Section IV, we check to see whether the results are robust across countries. Section V concludes with a summary and interpretation of the findings.

I. Going public in European countries 1988-1998

A. Institutional arrangements

In each of the seven countries under study, the regulations regarding an initial public offering (IPO) are set and maintained by the relevant exchange itself, with the consent of the Secretary of the Treasury, and must also be in accordance with legal guidelines that are set under the European Investment Services Directive.

Before a firm can make an IPO, it must first obtain permission from the Ministry of Finance to have its shares listed on an exchange. The request for a listing must be made on the basis of a "notice of introduction", whose contents are subject to detailed regulation and is generally filed 120 days before a company starts trading. In the case that the shares are listed, the professional association or government body acts as the regulatory agency. The issuing firm must also meet certain criteria such as providing annual accounts over a certain period of time, specifying the uses to which the proceeds of the offering will be put, and disclosing the shareholdings of the management and board of directors. Moreover, a chartered accountant must certify the firm's annual accounts, and an offering prospectus must be submitted to the stock exchange by a member of the association, who sponsors the request. In the countries under study, a universal or an investment bank typically underwrites the IPO.[2] The underwriter is not only involved in working out the registration statement, but is also responsible for managing the underwriting and floatation process.

A company has, in principle, a choice between three market segments in which to list its shares: The Official Market, the Official Parallel Market or the New Market.[3] The choice of market segment is mainly based upon the minimum size of the issue. Moreover, while the minimum Public Float on the Official Market is at least 25 percent, no such requirements exist for shares seeking admission to the Official Parallel Market or the New Market. New Market segments, added since the mid-1990s to many European stock exchanges, cater exclusively to young, high-growth companies in technology-oriented market sectors. Lower requirements for companies listed on the New Market segments in terms of capital and operating history are offset by more stringent transparency and reporting rules after the IPO date. It must be stressed that the relevant authority has the right to waive certain listing requirements.[4] While electronic trading of shares takes place in all market segments in France, Italy, Sweden and Switzerland, the main stock exchange operators in Germany, The Netherlands and Spain have maintained a hybrid system of floor-based and electronic trading.

Firms that intend to go public have – at least in principle – a choice of which method their shares are offered to the public. A company can use one of the following methods to obtaining a listing and issuing equity: "private placing", "offer for sale by tender",

[2] Particularly in Germany, companies seeking a listing have usually been engaged in a long-run relationship with its underwriter ("Hausbankbeziehung").

[3] In the Appendix, Table AI, we summarize the main listing requirements that applied to the stock exchanges in the countries under study between 1988 and 1998. We do not cover companies going public in other market segments, such as the Unregulated Market or NASDAQ Europe (formerly EASDAQ).

[4] This is explicitly stated in the statutes of the Milan Stock Exchange. For companies going public in Sweden, because of the prevalence of dual-class shares, direct focus is given to the voting and ownership structure of companies going public. Here, the minimum number of shareholders necessary for floatation is explicitly stated.

also referred to as "bookbuilding", and "offer for sale at a fixed price".[5] In an "offer for sale at a fixed price", the fixed price element is designed to widen the appeal of the issue for investors by eliminating price uncertainty. The prospectus states the number of shares being offered for sale and the price per share. Investors can then submit bids for the number of shares they wish to take up at the stated price. In "offers for sale at a fixed price", while applications are invited from the general public, the issue is sub-underwritten, at the same price, by a group of financial institutions. Once the price of the issue is fixed, it can neither be changed in response to emerging demand, nor withdrawn. With the possible exception of France, the majority of companies going public in the countries under observation went public through "offers for sale at a fixed price" until the mid-1990s. The major proclaimed disadvantage of an "offer for sale by tender" which uses "bookbuilding" procedure is that it cannot eliminate price uncertainty. However, with strong issuing activity and rising equity markets since 1995, during which companies, led by E Merck AG, a German pharmaceutical company, issued high volumes of shares, the bookbuilding method has been increasingly used as a means for going public as it allows the market itself "much more power in the issuance process".[6] Since the mid-1990s, bookbuilding has become the pricing mechanism of choice for 70 percent of the IPOs in our sample. The inherent advantages of this procedure are that it seeks to assess market conditions before pricing, and that the final issue price is conditioned on market demand.

The average total direct cost for a company going public in the sample varies between 5 percent and 7 percent.[7] This fee structure has been relatively stable over year and country, despite growing competition for mandates between investment banks, and seems to exist irrespectively of type, nature and risk profile of the company. Using 2,051 IPOs in 61 non-US markets between 1992 and 1999, Jenkinson, Ljungqvist and Wilhelm (2000) study whether the introduction of bookbuilding has increased the efficiency of IPOs. They find that – while the direct costs of bookbuilding are typically twice that for fixed-price offers – bookbuilding leads to substantially less underpricing.

In general, the relevant stock exchange operators do not have any rules on how oversubscribed issues are to be allocated, beyond the general principle that the allocation must be done systematically.[8] The degree and method of scaling down is entirely at the discretion of the issuing house and may involve any form or pattern that best suits the particular circumstances or interests of the company and its underwriter.[9] This may involve a ballot and/or scaling down of applications. In fact, the adopted method of allocation reflects the company's preference regarding the profile of its new shareholders, for example a large number of small individual investors versus institutional investors. Reimer (1998) discusses hot German IPOs where institutional

[5] We do not discuss "Private Placements" in detail because they apply to low volume issues only. Derrien and Womack (1998) and Biais and Faugeron-Crouzet (2002) discuss other IPO mechanism unique to the French market.

[6] Reuters News Service, (December 27, 1995): "German IPO pace to slow but demand still strong."

[7] Kaserer and Kraft (2000) provide a detailed study of floatation costs in Germany. Chen and Ritter (1999) document that in the US, at least 90 percent of deals that raised between 20 and 80 million Dollars have underwriting spreads exactly equal to 7 percent, and relate this to the lack of competition between investment bankers.

[8] Oversubscription is a common feature for the IPOs under study. In Germany and The Netherlands, for example, oversubscription has been fuelled by the fact that there is no pre-payment for IPOs. Payment for the shares is made after the allocation of the bids is announced and trading starts.

[9] The fairness of the allocation mechanism has been subject to constant public debate and increasing regulatory scrutiny. See Forbes, (June 22, 1992), pp. 156-162, or Wall Street Journal Europe, (June 15, 1994): "Investors in US Question Access to IPOs, raising issue of Fairness", or Reimer (1998).

investors received a disproportionately large fraction of the shares on sale. This is consistent with the empirical findings by Cornelli and Goldreich (2001) who find that "bidders who participate in many issues receive favourable treatment especially in the more successful (i.e. oversubscribed) issues". Furthermore, Ljungqvist and Wilhelm (2002) document that the frequency of directed share programs (friends and family shares) increased dramatically between 1996 and 1999.

B. Previous Literature

The focus of the empirical literature on IPOs in Continental Europe and Scandinavia has shifted over time. While most of the studies in the early 1990s focus on the underpricing phenomenon and its theoretical foundations, the research has increasingly concentrated on the cross-sectional study of aftermarket performance with respect to unique aspects of each country under observation. This has also involved going beyond the analysis of time-series stock price data to include the evaluation of operating performance data, the types of earnings management around the IPO date, and aspects of finance and law.[10]

B.1. Germany

Stehle, Erhardt and Przyborowsky (1998) study the short- and long-run performance of a sample of 222 German IPOs between 1960 and 1995. The authors find statistically and economically significant underpricing of 15.7 percent. Using an equally-weighted market portfolio as a benchmark, they also find a statistically insignificant buy-and-hold performance of negative 5.0 percent over a 36-month time horizon. Moreover, they argue that, because IPO stocks are typically small- or medium-sized, market portfolios might not make ideal benchmarks in IPOs studies. According to the study, the results on long-term performance are fully in line with the efficient market hypothesis and the hypothesis of deliberate underpricing. Schuster (1996) focuses on the performance of 126 German IPOs issued between 1988 and 1995. He finds significant short-run overperformance. Moreover, he finds variations in year-to-year performance, across industries and other issuing characteristics, with larger companies as well as those with lower initial returns faring the worst. Due to the high median age of 49 years, it is hypothesized that the German IPO market is more of an M&A market than a venture capital market, indicated by the fact that IPO proceeds flow into maturing and declining industries, rather than those that are growing and dynamic. Other studies for the German IPO market include Ljungqvist (1997), Uhlir (1989) and Weinberger (1995) who reported evidence concerning underpricing and long-term performance.

B.2. France

Derrien and Womack (2002) focus on the efficiency of the main procedures of going public in France under different market conditions and mechanisms: a bookbuilding mechanism similar to the one used in the US, a fixed-price procedure and an auction-like procedure. They show that overall market momentum in the three months prior to an offering is a significant ex ante predictor of the level of underpricing. In the sample of 264 French IPOs that went public on the French Official Parallel Market and New

[10] Using inferences from individual country studies to make general statements about patterns in the European IPO market is difficult because of varying empirical methodologies, different sample sizes, measurement periods and the quality of data.

Market between 1992 and 1998, mean underpricing reached 13.2 percent. After controlling for issuer and industry specific factors, they also find that the auction mechanism is associated with less underpricing and lower variance of underpricing. Using Cumulated Average Returns (CARs) starting from the eleventh trading day, they find insignificant average adjusted underperformance of negative 6.2 percent for the sample over a two-year horizon. More generally, their work provides empirical support for the theoretical work of Biais, Bossaerts & Rochet (2002), who find that an IPO mechanism similar to France's auction-like Offre à Prix Minimum (OPM) is optimal.[11] Faugeron-Crouzet, Ginglinger and Vijayraghavan (2001) focus on the relationship between the initial underpricing and the subsequent recourse to the capital market for a sample 288 firms that made an IPO on the French Official Parallel Market between 1983 and 1994. While they find positive initial returns of 18.7 percent for the sample as a whole, they also find that firms which are more undervalued tend to subsequently issue shares, while firms which are not as undervalued tend to subsequently issue other kinds of hybrid security. Degeorge and Derrien (2000) examine the long-run stock price performance and earnings forecasts at the time of the IPO using a sample of 243 French IPOs that went public on the Official Parallel and New Market between 1991 and 1998. Using a variety of benchmarks and calculation j12 0 0 12 333.90.00ra whoshow Tm(IIP961 Tm(p)T

B.4. The Netherlands

Bosveld and Venneman (2000) analyse the investment and operating performance of a sample of 120 Dutch IPOs between 1983 and 1999 that went public on the three market segments of the Amsterdam Exchanges. They find highly significant average adjusted initial returns of 9.9 percent. The significance and magnitude of these returns, however, do vary widely over time. When calculated without outliers, it appears that the influence of the few extremely high returns is larger than that of the few extremely low returns. Furthermore, when using either of three benchmark adjustments, the authors do not find underperformance during the first three years of trading. Regardless of the benchmark choice, however, IPOs underperform the market after four or five years of trading. They find that, on average, for every Dutch Guilder (NLG) 100 invested in the benchmark, one would have had to invest NLG118 in the IPOs to obtain the same terminal wealth level after four years of trading, or even NLG124 to obtain the same terminal wealth level after five years of trading. They also show that Dutch IPOs are timed to coincide with periods of unusually good operating performance levels and find that the practise of "window dressing" is common prior to the IPO.

Roosenboom, Van der Goot, and Mertens (2001) examine the relationship between two forms of earnings management and the fortunes of a sample of 80 IPO firms that went public on the Amsterdam Exchanges between 1984 and 1994. The result provides evidence that the form of earnings management during the IPO year can partially explain the cross-sectional variation in long-run stock price performance. Using buy-and-hold returns, firms in which managers tend to overreport earnings during the IPO year subsequently perform poorly, and IPO firms in which managers smooth their income overperform their counterparts by a margin of more than 100 percent during a period of three years, adjusted for a number of different benchmarks. Van der Goot (1997) focuses on the quality of information by studying the offering prospectuses of 74 IPOs on the Amsterdam Exchanges between 1983 and 1992. He finds that cash flow statements do not contribute to reducing information inequality between a firm's management and its investors. Moreover, he stresses that valuation models based on Price-Earnings Ratios or Price-Book Ratios can only explain little of the observed variance in the issuing firm's value. The author also points to a statistically significant negative relationship between firm value and the number of takeover defences introduced by a firm.

B.5. Spain

Álvarez and Gonzáles (2001) provide a detailed analysis of the short- and long-run performance of 56 Spanish IPOs, including four foreign issues, on the Madrid Stock Exchange between 1987 and 1997. The authors also investigate the influence of IPO prospectus information on the long-run returns of IPOs. For the sample of companies, they report a highly significant unadjusted underpricing of 12.3 percent. With event windows of three and five years, they report mixed results for long-run performance. The magnitude of abnormal returns depends on the methodology, the weighting method and the benchmark used for the adjustment of IPO returns. While long-run underperformance is present when calculating buy-and-hold returns, it is not present when using other methodologies for returns measurement, such as calendar time returns or the Fama-French three factor model. Long-run underperformance is also concentrated in small firms. Moreover, none but two of the issuing characteristics of the offer are related to the behaviour of the stock price over three to five years. They find a

positive relationship between initial underpricing, long-run performance and the percentage of shares retained confirming the signaling hypothesis. In a similar work, Olcoz and Feldsztaijn (2000) report 10.6 percent initial underpricing of a sample of 99 IPOs in the Madrid and Barcelona Stock Exchanges between 1986 and 1998. This sample also underperformed the Madrid Stock Exchanges General Index (IGBM) by 29.0 percent over three years. Companies with the highest Return on Equity (ROE) at the time of going public tend to be the best performers in the long-run. Rahnema, Fernández, and Martínez Abascal (1992) examine the short- and long-run performance of 85 Spanish IPOs over the period 1985-1990. Here, Spanish IPOs experience, on average, 10.8 percent underpricing. "Handsome returns" may be earned by investing in new issues, but the authors recommend liquidating within the first 90 days after the first market price. In addition, they argue that it is possible to reduce the degree of underpricing by selecting the optimal timing, underwriter, and type of placement.

B.6. Sweden

Rydqvist (1993, 1997) documents IPO underpricing from the perspective of companies going public in Sweden. In his sample, composed of 224 new firms and 84 equity carve-outs during 1970-1991, average underpricing reached 39 percent. He stresses the uniqueness of the Swedish IPO market: The significant difference in marginal tax rates between salary increases (85 percent marginal tax) and capital gains (20 percent marginal tax) led firms to allocate a significant portion of the offer to firm employees and key decision makers of the firm's creditors, suppliers and customers. Therefore, underpricing was driven by an incentive to replace salary increases with tax-efficient capital gains. The tax motivation for underpricing disappeared when a new tax code was introduced in 1990. This led to a subsequent drop in underpricing. In a similar analysis of IPOs between 1970 and 1991, Högholm (1994) finds a positive relationship between the level of underpricing and the level of ex-ante uncertainty surrounding the IPO. Firms belonging to the service sector seem to underprice their IPOs more than other firms. He also finds different levels of underpricing depending on the motive for going public. Using a sample of 162 Swedish IPOs between 1980 and 1990, Loughran, Ritter and Rydqvist (1994) find initial returns of 38.2 percent and a market-adjusted three-year return of 1.2 percent.

A different line of research provides a legal and financial commentary of Swedish IPOs. Holmén and Högfeldt (2000) study how a legal regime, that provides weak minority protection and allows for the separation of votes from capital, affects behavior at the time of and after the IPO. They study 229 Swedish IPOs (excluding equity-carve-outs and spin-offs) between 1979 and 1997, when close to 90 percent of all privately controlled Swedish IPOs used dual-class shares and issued only low-voting B-shares. They find that private owners who place much emphasis on being in control design the corporate charter and the initial ownership structure to maintain control after the IPO. Five years after the IPO, the original private owners of the companies in their sample retained 2/3 of the votes and 44 percent of the capital. Moreover, if the firm has dual-class shares, the controlling owner has a stronger incentive to invest and acquire other firms in stock financed takeovers since the owner only contributes a smaller fraction of the capital but exclusively enjoys all control rights of the larger firms. Furthermore, they find that private owners in control firms that later undertake seasoned equity offerings retain a significantly higher proportion of votes and capital at the IPO date compared to other privately controlled firms. According to the authors, differences in ownership concentration, investment behavior and takeover frequency between

Continental European/Scandinavian and the Anlgo-Saxon countries are, to a large extent, determined by endogenously established differences in security design and initial ownership structure at the IPO date that reflect differences in legal regimes.

B.7. Switzerland

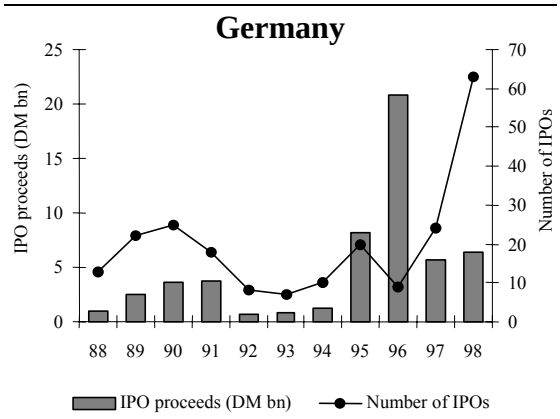
Kunz and Aggarwal (1994) study underpricing of a sample of 42 IPOs that were issued in Switzerland between 1983 and 1989. They find a 35.8 percent average initial return between the offering price and the closing price on the first day of trading for 42 Swiss IPOs. No long-run underperformance in the aftermarket is observed. The average excess returns remain well above 30 percent up to three years after the IPO. The authors point to a decrease of underpricing over time, indicating growing competition between investment banks. They also argue that companies may intentionally underprice their stocks in order to invest into their reputation by getting "free publicity". Moreover, they find that the reserved disclosure policy of Swiss companies and the traditionally close ties between issuer and underwriter, may possibly explain the high average underpricing in Switzerland as compared to other countries.

II. Data and Methodology

A. Data

The data was hand-collected in two phases. First, we identified the IPOs and a number of offering characteristics. These data include full name of the offering company, nationality, date and place of the offering, total number of shares issued, the percentage of equity offered (adjusted for overalottment options exercised), issue price, industry group and the year of foundation. Offering characteristics were identified from annual issuing statistics provided by the relevant national stock exchange operators or regulating agency, professional publications and newspapers and, if necessary, by contacting the issuing company. Second, we collected daily closing prices from the national stock market operators (in the case of France, Italy and Spain), from an academic institution (in the case for part of the German data) and from Datastream (in the case of The Netherlands, Switzerland and Sweden). Time-series data for the benchmarks and GDP deflators were taken from Datastream. For our classification into sectors, we use the Dow Jones STOXX classification scheme.

Our final sample is comprised of 973 companies which conducted an IPO of common and/or preferred stock on one of the three main market segments of the main national stock exchange operator in Germany (219 companies), France (323), Italy (77), The Netherlands (75), Spain (88), Sweden (148) and Switzerland (43). We excluded foreign listings, Real Estate Investment Trusts, demutualizations and companies, which transferred from one market segment to another. Based on our original records, the sample represents at least 90 percent of IPO activity in the countries under study during the time period studied. Because of our intention to provide a comparative country-by-country study, we calculate returns in local currency using a local trading day calendar. In the cross-sectional analysis, we report aftermarket


Germany
IPO proceeds (DM bn)
Number of IPOs
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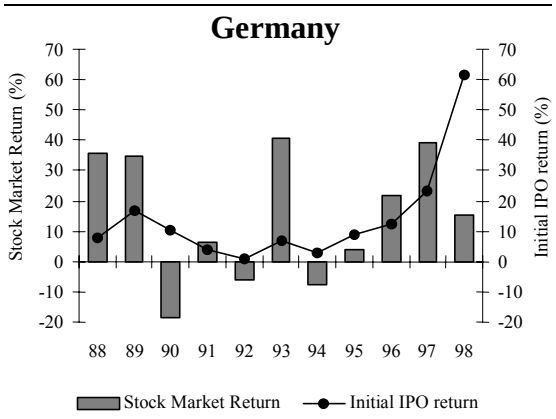
IPO proceeds (DM bn)
Number of IPOs


Germany
Stock Market Return (%)
Initial IPO return (%)
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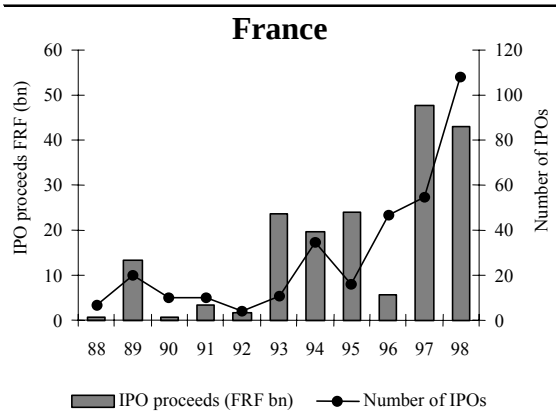
Stock Market Return
Initial IPO return


France
IPO proceeds FRF (bn)
Number of IPOs
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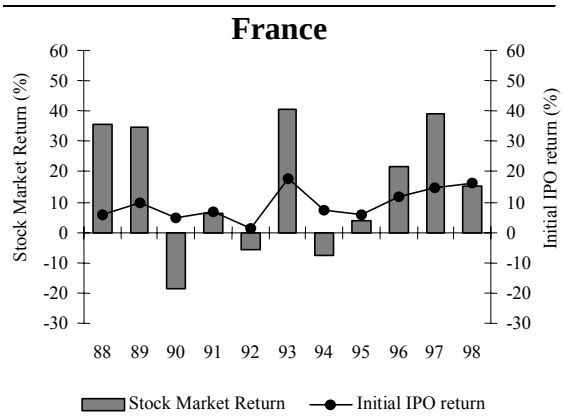
IPO proceeds (FRF bn)
Number of IPOs


France
Stock Market Return (%)
Initial IPO return (%)
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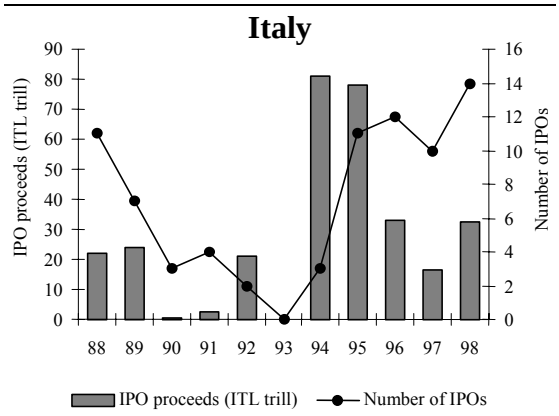
Stock Market Return
Initial IPO return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IPO proceeds (ITL trill)
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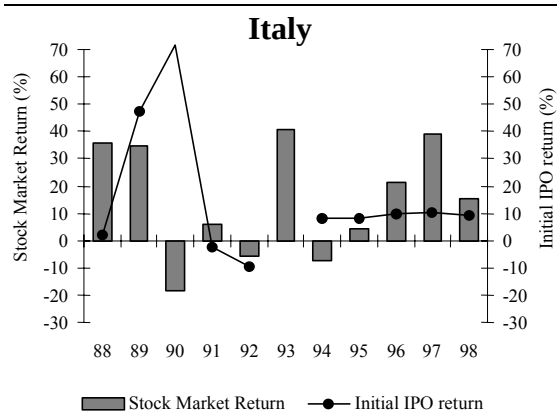
IPO proceeds (ITL trill)
Number of IPOs


Italy
Stock Market Return (%)
Initial IPO return (%)
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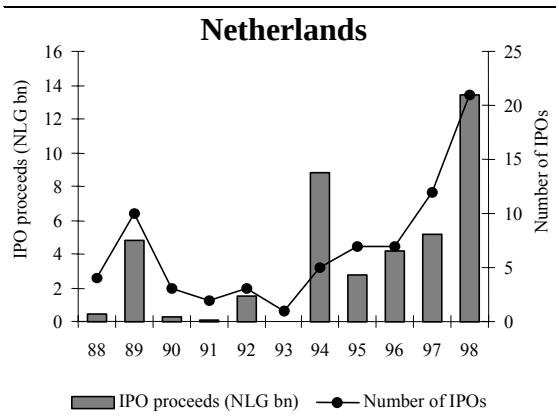
Stock Market Return
Initial IPO return


Netherlands
IPO proceeds (NLG bn)
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IPO proceeds (NLG bn)
Number of IPOs

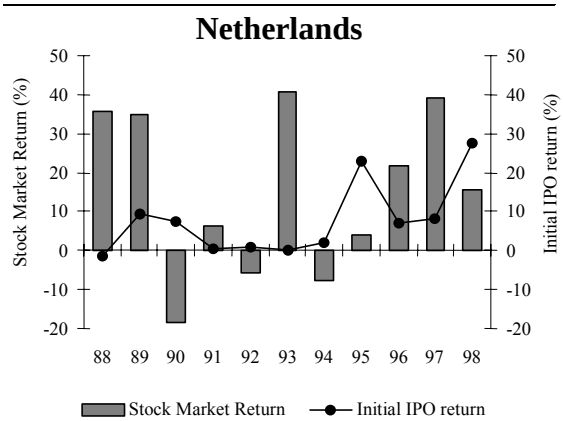

Netherlands
Stock Market Return (%)
Initial IPO return (%)
88 89 90 91 92 93 94 95 96 97 98
Stock Market Return
Initial IPO return

Figure 1: *continued*

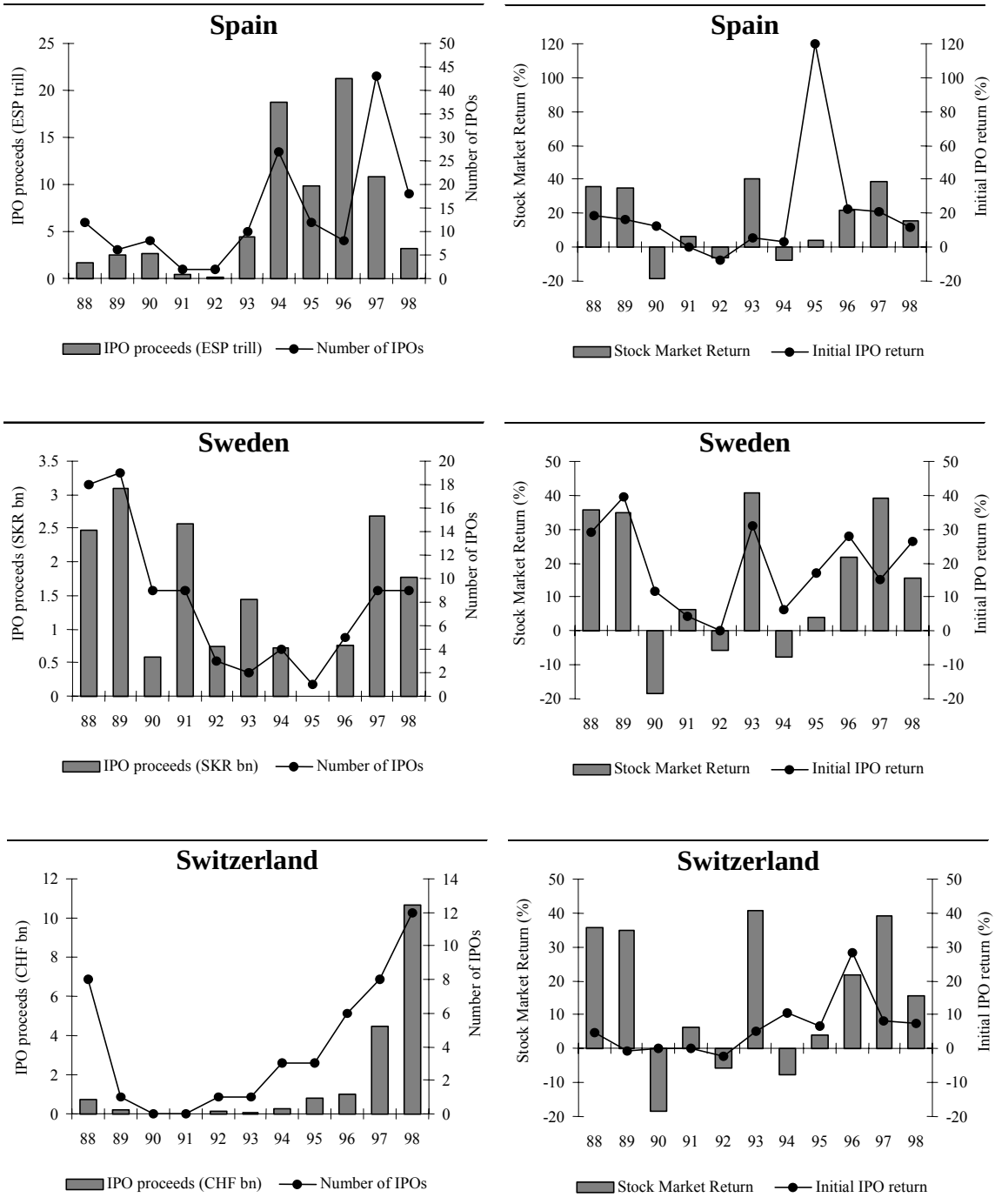


Figure 1. IPO activity and Stock Market Returns in European Countries. IPO proceeds are measured in 1998 purchasing power and defined as the number of shares offered to the public times the final offering price and include overalottment options, if applicable. The Initial Return is defined as the change from the IPO price to the closing price at the end of the first day of trading. The annual stock market return is defined as the annual change in the national stock market in the country under study. The following indices (all value-weighted) were used as a proxy for the respective national stock market: the FAZ Index for Germany, the SBF 250 Index for the France, the MIB Historical Index for Italy, the CBS Index for The Netherlands, the Madrid General Index for Spain, the Affärsvärlden General Index for Sweden and the Swiss Total Market Index for Switzerland.

performance categorized by initial return, age, size, percentage of equity offered, time period of offering and sector.

Figure 1 shows that the number and value of IPOs was unevenly distributed across the sample period in each country under study. It underlines that the sample consists of stocks issued in both high activity and low activity markets, in which the underlying momentum in the general level of the stock market is positive. In this respect the sample is consistent with most of the empirical studies in the literature. Figure 1 also underlines the link between IPO activity and general level of the stock market.[12]

Table I summarizes the IPO sample characteristics for the individual European countries. The size of the public float (in percent) is relatively uniform across countries. It is also consistent with findings by Espenlaub and Tonks (1998), who report that for a sample of 428 IPOs of UK incorporated, non-financial companies issued during 1986-1991, the average proportion of equity sold was 29.49 percent. Initially, IPOs came from a variety of industries and were carried out by larger and older firms. This coincides with the evidence provided by Loughran, Ritter and Rydqvist (1994) who show that in Continental Europe, most of the firms that enter the market are more mature, larger and more established than their counterparts in the US. However, average age and number of industries represented has declined during the sample period. This is not surprising considering the large number of service- and technology-related IPOs in the German, French and Swedish market segments since the mid-1990s, combined with the rapid rise in equity ownership and financial integration in Continental Europe toward the late 1990s.

Table I
Sample Characteristics

Characteristics of IPOs in European countries between 1988 and 1998. Age of the issuing firm is measured as the calendar year of going public minus the calendar year of foundation, with firms founded before 1901 assumed to be founded in 1901. Public Float is the percentage of equity offered. Firm Size (expressed in local currency units), is the total number of shares issued times the final offer price. Gross Proceeds are in local currency units and defined as the number of shares placed multiplied by the offer price and include overalottment options (greenshoe), where applicable. All values are expressed in end-1998 prices using the monthly consumer price indices relating to each country. Market Sectors is a proxy for the diversity of the IPO market and represents the number of market sectors present out all 18 market sectors defined in the attached Dow Jones STOXX global classification standard.

	Age, years		Public Float, Percentage		Firm Size, millions/billions		Gross Proceeds, millions/billions		Market Sectors
Country	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Number
Germany	35	23	38	33	803.5	192.6	250.4	71.8	17
France	21	13	21	18	1,966.9	250.9	568.1	47.2	18
Italy	25	19	32	29	1,674.0	235.3	404.9	71.9	17
Netherlands	31	18	39	33	1,504.9	290.0	552.6	92.9	15
Spain	38	31	40	38	60.6	21.4	19.1	8.1	16
Sweden	25	14	39	33	1,207.2	337.0	512.2	93.9	15
Switzerland	30	27	65	59	678.7	158.1	428.4	95.1	12

[12] Loughran, Ritter and Rydqvist (1994) provide evidence that companies successfully time their offerings for periods when valuations are high, with investors receiving low returns in the long-run.

Table II
Sample Distribution

Distribution of Initial Public Offerings (IPOs) by country and year of issuance from 1988 to 1998, excluding demutualizations, investment companies and foreign issues. Equity carve-outs, spin-offs and privatizations are included. Gross proceeds are in local currency units and defined as the number of shares placed multiplied by the offer price, and include overalottment options (greenshoe), where applicable. Aggregate gross proceeds are expressed in end-1998 prices using monthly consumer price indices of the respective country.

Distribution of European IPOs by Country and Year of Issuance														
	Germany		*France*		*Italy*		*Netherlands*		*Spain*		*Sweden*		*Switzerland*	
IPO Year	Number of IPOs	Aggregate Gross Proceeds DMm	Number Of IPOs	Aggregate Gross Proceeds FRFm	Number of IPOs	Aggregate Gross Proceeds ITLbn	Number Of IPOs	Aggregate Gross Proceeds NLGm	Number of IPOs	Aggregate Gross Proceeds ESPbn	Number of IPOs	Aggregate Gross Proceeds SKRm	Number of IPOs	Aggregate Gross Proceeds CHFm
1988	13	979.0	7	721.6	11	2,214.2	4	402.5	18	246.5	12	1,658.3	8	755.5
1989	22	2,534.2	20	13,493.9	7	2,415.3	10	4,843.3	19	309.8	6	2,480.5	1	191.3
1990	25	3,648.9	10	652.2	3	66.1	3	286.3	9	57.8	8	2,652.9	0	-
1991	18	3,753.3	10	3,316.4	4	238.2	2	48.2	9	256.0	2	439.2	0	-
1992	8	709.3	4	1,551.5	2	2,083.5	3	1,485.2	3	73.8	2	143.9	1	158.1
1993	7	890.4	11	23,589.7	0	-	1	16.8	2	144.1	10	4,488.8	1	63.5
1994	10	1,218.9	35	19,674.2	3	8,095.7	5	8,783.5	4	72.7	27	18,782.9	3	269.4
1995	20	8,129.1	16	24,020.3	11	7,810.5	7	2,766.4	1	0.4	12	9,881.2	3	818.5
1996	9	20,854.7	47	5,810.6	12	3,324.3	7	4,209.0	5	75.2	8	21,267.2	6	1,031.4
1997	24	5,696.3	55	47,754.1	10	1,659.2	12	5,161.0	9	268.9	43	10,833.5	8	4,492.6
1998	63	6,413.8	108	42,923.4	14	3,269.7	21	13,442.5	9	177.3	18	3,175.8	12	10,640.9
Total	219	54,828.2	323	183,508.0	77	31,176.7	75	41,444.6	88	1,682.7	148	75,804.1	43	18,421.2

Table II presents the distribution of IPOs in Continental Europe and Sweden by year, both in terms of the number of IPOs and gross proceeds. It shows that the number and value of IPOs were not evenly distributed over the sample period. While years 1988 to 1990 were relatively high volume years in all countries under study, years between 1991 and 1993 were years of low issuing activity. For example, during 1990 and 1991, there was no IPO activity in Switzerland, while Italy did not record any IPO activity in 1993. Ahead of large privatization programmes, 1995 represented a year with high IPO activity, in terms of proceeds raised, size of companies and number of IPOs. Most of the issuing activity in Spain was concentrated in 1988 and 1989. This is partially attributable to the effect of the Spanish Securities Markets Law aimed at achieving greater penetration, transparency and liquidity. Moreover, while the strong increase of the number of listings in France was partly driven by the creation of the Nouveau Marché in 1996, it was also driven by a change in French tax law.[13] In the other countries under study, there is no relevant legislation in place that would offer any incentive of a fiscal or financial nature to venture capitalists and venture capital companies similar to those in France.

There were also some key institutional determinants of the emergence and growth of firms in Sweden. For example, a gradual deregulation of the capital markets during the sample period, a cut in corporate taxes and the deregulation of previously regulated markets have spurred-on entrepreneurial activity and stock market listings in Sweden since the mid-1990s. This came against the backdrop of traditionally high share ownership: around 60 percent of the Swedish adult population own shares. Davidsson and Henrekson (2000) identify some of the factors that have been particularly favourable for the emergence of Swedish firms, such as deregulation and "fortuitous" facts such as being a frontrunner in certain areas of technology, like telecommunications equipment manufacturing, for example.

B. Methodology

As reported earlier, the results of long-term performance studies are very sensitive to methodological choices. Here, we take this robustness issue seriously and present our results using a variety of methods. As in the previous chapter, we use an event-study methodology similar to Ritter (1991) for the evaluation of short- and long-run IPO performance. In this study, two measures of abnormal returns are computed for each country: First, cumulative average returns (CAR_T) are calculated, defined as the average of cumulated benchmark-adjusted returns of individual stocks (R_{it}) using several different benchmarks:

$$CAR_T = \frac{1}{N} \sum_{i=+1}^{N} \sum_{t=+1}^{T} R_{it}$$

[13] Under French legislation, there are two primary venture capital vehicles: the Société de capital risque ("SCR") and the Fonds commun de placement à risques ("FCPR"). In order to obtain certain tax benefits, these vehicles are required to invest at least 50 percent of their assets in qualifying non-quoted securities of EU companies. Moreover, when unquoted securities or shares which are eligible to be included in the 50 percent limit upon acquisition by the SCR or FCPR and subsequently become listed on a regulated stock market, they continue to be included within such 50 percent limit during the five-year period following the IPO date. Under certain conditions, if a SCR or a FCPR acquires shares that are listed on the Nouveau Marché, these shares will be considered as non-quoted shares for the purpose of the 50 percent quote. (Source: European Venture Capital Association).

As an alternative to using cumulative-average returns, which implicitly assumes monthly portfolio rebalancing, we also compute adjusted and unadjusted three-year buy-and-hold returns:

$$BHR_T = \frac{1}{N}\sum_{i=+1}^{N} (1 + R_{it}) - 1$$

where R_{it} is the abnormal return in month t for firm i, with N firms in the sample. While there is greater knowledge about the properties of the distribution and the statistical tests for CARs, BHRs measure actual investors experience. For the evaluation of statistical significance of CAR_T and BHR_T, we use a simple cross-sectional t-test.[14]

To interpret the three-year buy-and-hold performance, we also compute wealth relatives (WR) as a performance measure. The wealth relative is the ratio of one plus the mean IPO three-year holding period return (not in percent) divided by one plus the mean benchmark three-year holding period return (not in percent), excluding the initial return. A wealth relative greater than 1.00 indicates outperformance and a wealth relative less than 1.00 indicates IPO underperformance. The initial return is the unadjusted change from the offering price to the first closing price and is defined as month 0.[15] The aftermarket period includes the following 36 months, where one month is defined as a successive 21-day period using a local trading day calendar with returns denominated in local currency. For IPOs that are delisted before their third-year anniversary, the three-year buy-and-hold return ends with the last quoted price. To evaluate buy-and-hold returns of up to 36 months of trading, the sample had to be reduced to 677 issues. This is due to the large number of IPOs in 1998, that had not yet traded for three years as of February 2, 2001 (the cut-off date for this study).[16] For the sample as a whole, only seven companies were delisted before their third-year anniversary. This is sharp contrast to Ritter (1991) who reports that out of a total sample of 1,526 US IPOs, 272 firms were delisted before their third-year anniversary on the stock market.

Equally critical is the choice of benchmark. With the exception of Spain and Italy, returns for each individual country were adjusted using three different benchmarks: (1) a value weighted broad-market index, (2) a value weighted large-cap index, and a (3) value weighted small-cap or mid-cap index.[17] We have calculated performance measures without explicitly adjusting for betas. For the US market, Ritter (1991), Ibbotson (1975), Chan and Lakonishok (1990) and Clarkson and Thompson (1990) report that average betas for IPO firms are greater than 1.00 and decline over time. They argue that the difference in betas between the IPOs and the benchmark is too small to have a significant effect on the conclusions. Espenlaub, Gregory and Tonks (1998) apply a modified form of Ibbotson's (1975) RATS method to estimate the betas in their sample of 588 UK IPO firms between 1985 and 1995. Similar to US evidence, they find that the significance of the result of underperformance is likely to be understated rather

[14] For a further discussion of statistical inference, see Brown and Warner (1980), Kothari and Warner (1997), Barber and Lyon (1997) and Loughran and Ritter (2000), for example.

[15] Adjusting initial returns for market movements does not change the qualitative nature of the results.

[16] This number (677) is slightly lower than the total number of companies used to evaluate three-year aftermarket performance in Schuster's (2002) pan European IPO study (686 IPOs). In this paper, we used local trading days versus a European trading days (Schuster (2000)). Because of more public holidays, the local trading day calendar contains a smaller number of trading days per year in some countries.

[17] For Italy and Spain, no small- or mid-cap index was available covering the full length of the measurement period between 1988 and 2001.

than over-stated and that it is unlikely that the magnitude of the results can be explained away by specification errors. In his sample of 80 Finnish IPOs between 1984 and 1989, Keloharju (1993) conc431. 4h IPOs between 0 16ets ca7 0 0 12.007 306.5934 7434.462 Tm(Kelo

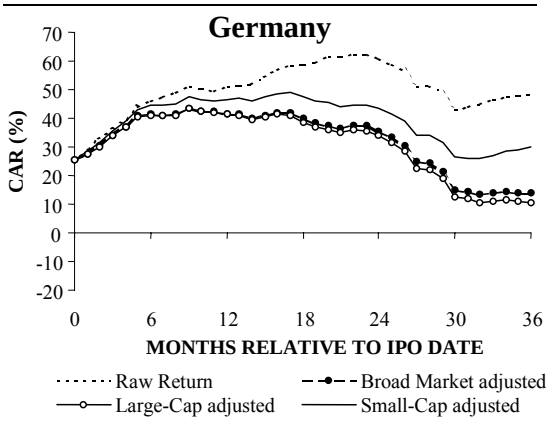
Table III

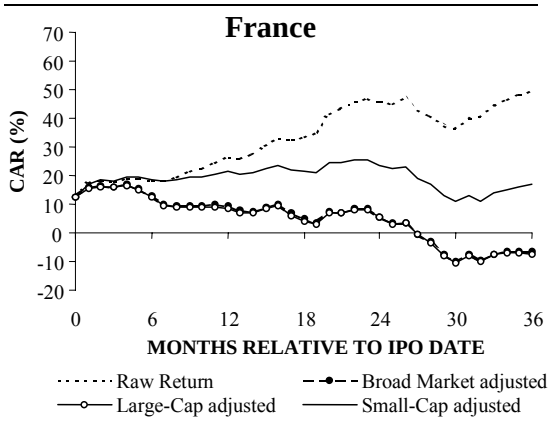
Cumulative Average Returns (CARs)

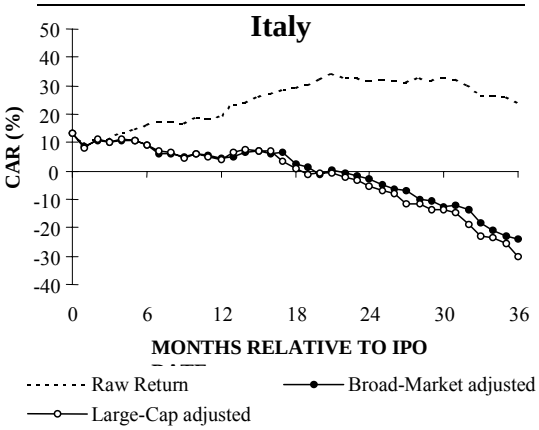
Aftermarket Returns are measured as Cumulative Average Returns (CARs), with associated Standard Errors (S.E.) (in parentheses) for the 36 months after going public, excluding the initial return. One month is defined as a consecutive 21-trading interval using local trading days. For each country, raw returns were adjusted for the following broad-market value-weighted benchmarks: German IPO returns were adjusted for the FAZ Index, French IPO returns for the SBF 250 Index, Italian IPO returns were adjusted for the MIB Historical Index, and the CBS Index, excluding Royal-Dutch, was the benchmark for the Dutch market. Spanish IPO returns were adjusted form movements in the Madrid General Market (IGBM) Index, the Affärsvärlden General Price (AFG) Index was used for the Swedish market, and the Swiss Total Market (STM) Index was the benchmark for the sample of Swiss IPOs. An adjustment for the relevant MSCI national indices does not change the results. Month 0 is the Initial Return interval.

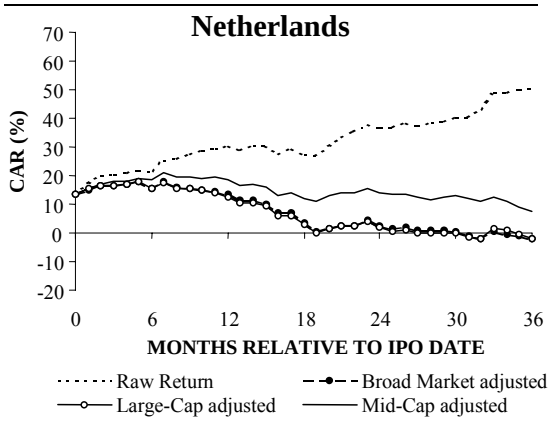
Panel A: Germany								
Month of trading	0	1	6	12	18	24	30	36
Number of firms	219	219	219	219	219	219	190	155
$CAR_{1,t}$	0.2566[a]	0.0208	0.1585[a]	0.1608[a]	0.1419[b]	0.1003	-0.1067	-0.1166
S.E.	(0.0334)	(0.0159)	(0.0417)	(0.0531)	(0.0700)	(0.0725)	(0.0739)	(0.0852)
Panel B: France								
Month of trading	0	1	6	12	18	24	30	36
Number of firms	323	323	323	323	321	315	284	213
$CAR_{1,t}$	0.1237[a]	0.0343[a]	0.0045	-0.0280	-0.0748	-0.0666	-0.2227[a]	-0.1901[a]
S.E.	(0.0104)	(0.0121)	(0.0232)	(0.0339)	(0.0475)	(0.0529)	(0.0553)	(0.0715)
Panel C: Italy								
Month of trading	0	1	6	12	18	24	30	36
Number of firms	77	77	77	77	76	74	70	59
$CAR_{1,t}$	0.1303[a]	-0.0454[a]	-0.0376	-0.0903	-0.1198	-0.1783[b]	-0.2596[a]	-0.4185[a]
S.E.	(0.0327)	(0.0124)	(0.0470)	(0.0613)	(0.0780)	(0.0859)	(0.0777)	(0.0918)
Panel E: The Netherlands								
Month of trading	0	1	6	12	18	24	30	36
Number of firms	75	75	75	75	74	72	67	53
$CAR_{1,t}$	0.1346[a]	0.0163	0.0221	0.0018	-0.0981	-0.1103	-0.1297	-0.1558
S.E.	(0.0259)	(0.0298)	(0.0450)	(0.0667)	(0.0713)	(0.0931)	(0.1091)	(0.1248)
Panel F: Spain								
Month of trading	0	1	6	12	18	24	30	36
Number of firms	88	88	88	87	87	87	80	68
$CAR_{1,t}$	0.1475[a]	-0.0015	-0.0161	-0.0782[b]	-0.1756[a]	-0.2661[a]	-0.3500[a]	-0.3021[a]
S.E.	(0.0260)	(0.0154)	(0.0303)	(0.0388)	(0.0495)	(0.0688)	(0.0761)	(0.1667)
Panel G: Sweden								
Month of trading	0	1	6	12	18	24	30	36
Number of firms	148	148	147	146	141	132	119	99
$CAR_{1,t}$	0.1846[a]	0.0071	0.0295	0.0140	0.0418	0.0523	0.0493	-0.1270
S.E.	(0.0233)	(0.0158)	(0.0286)	(0.0392)	(0.0570)	(0.0644)	(0.0760)	(0.0789)
Panel H: Switzerland								
Month of trading	0	1	6	12	18	24	30	36
Number of firms	43	43	43	43	43	43	42	31
$CAR_{1,t}$	0.0971[a]	-0.0217	-0.0226	-0.0646	-0.0485	-0.0446	-0.0502	-0.1817
S.E.	(0.0228)	(0.0166)	(0.0312)	(0.0518)	(0.0735)	(0.0998)	(0.1127)	(0.1378)

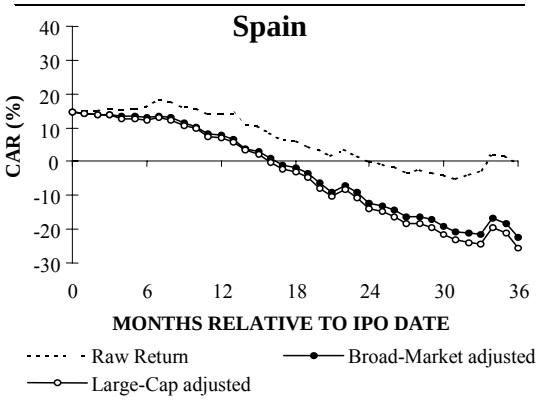
[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.

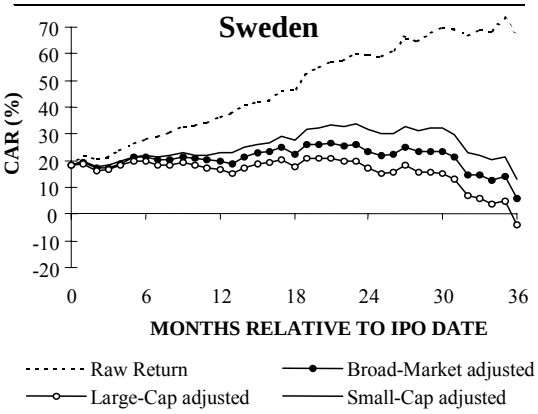

Germany
CAR (%)
MONTHS RELATIVE TO IPO DATE
Raw Return
Broad Market adjusted
Large-Cap adjusted
Small-Cap adjusted


France
CAR (%)
MONTHS RELATIVE TO IPO DATE
Raw Return
Broad Market adjusted
Large-Cap adjusted
Small-Cap adjusted


Italy
CAR (%)
MONTHS RELATIVE TO IPO
Raw Return
Broad-Market adjusted
Large-Cap adjusted


Netherlands
CAR (%)
MONTHS RELATIVE TO IPO DATE
Raw Return
Broad Market adjusted
Large-Cap adjusted
Mid-Cap adjusted


Spain
CAR (%)
MONTHS RELATIVE TO IPO DATE
Raw Return
Broad-Market adjusted
Large-Cap adjusted


Sweden
CAR (%)
MONTHS RELATIVE TO IPO DATE
Raw Return
Broad-Market adjusted
Large-Cap adjusted
Small-Cap adjusted

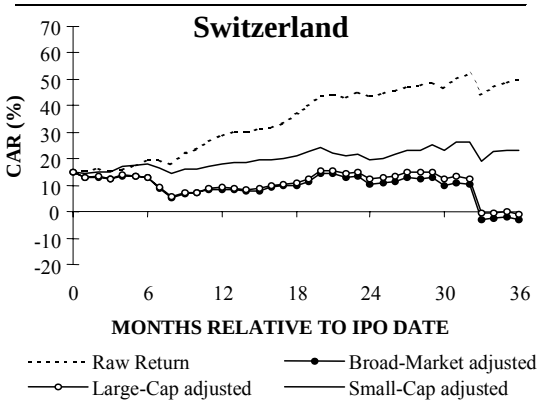

Switzerland
CAR (%)
MONTHS RELATIVE TO IPO DATE
Raw Return
Broad-Market adjusted
Large-Cap adjusted
Small-Cap adjusted

Figure 2. The Long-Run Performance of IPOs in European Countries. Cumulative average returns (CARs) for an equally-weighted portfolio of Initial Public Offerings in Germany, France, Italy, The Netherlands, Spain, Sweden and Switzerland between 1988 and 1998, with monthly rebalancing, month 1 to 36. One month is defined as a consecutive 21-day trading interval using local trading days. With the exception of Italy and Spain, four CAR series are plotted for each country for the 36 months after the IPO date: 1) raw returns (no adjustment); 2) a broad-market value-weighted index adjustment; 3) a value-weighted large-cap index adjustment; and 4) a value-weighted small-cap or mid-cap index adjustment. The FAZ Index (broad-market), the DAX 30 Index (large-caps) and the GSC100 Index (small-caps) were used as benchmarks for the adjustment of raw German IPO returns. French IPO returns were adjusted for the SBF 250 Index (broad-market), the CAC40 Index (large-caps) and the AGEFI Second Market Index (small-caps). Because of a lack of a small-cap benchmark over the full measurement period, Italian IPO returns were adjusted for the following two benchmarks: the MIB Historical Index (broad-market) and the MIB 30 Index (large-caps). Dutch IPO returns were adjusted using the CBS Index, excluding Royal Dutch (broad-market), the EOE Index (large-caps) and the MKAP Index (small/mid-caps) as benchmarks. Due to a lack of benchmarks for small-cap stocks over the sample period, Spanish IPO returns were adjusted using the IGBM Index (broad-market) and the IBEX35 Index (large-caps). The Affärsvärlden General Index (broad-market), the OMX 30 Index (large-caps) and the James Capel Smaller Companies Index (small-caps) were used for the adjustment of raw Swedish IPO returns. Finally, Swiss IPO returns were adjusted for the Swiss Total Market Index (broad-market), the SBC 100 Index (large-caps) and the Swiss Small Cap Index (small-caps). An adjustment for the set of Morgan Stanley country indices (MSCI) leads to similar results. Month 0 is the initial return interval. Returns were calculated on the basis of final closing prices.

The reported results are generally in line with the existing empirical literature in the countries under study. Looking at the first 36 months of trading, underperformance across the individual countries does not, however, reach the degree of significance reported in Ritter (1991) who uses a much larger sample and matching firms as a benchmark for reporting abnormal returns.

In Table IV, we show the distribution of unadjusted three-year buy-and-hold (BHRs) returns for the individual countries under study. Median IPO three-year returns are positive in only three countries: The Netherlands, Sweden and Switzerland. Swedish IPOs performed best with a median three-year buy-and-hold return of 26.76 percent. This is due to a large number of companies that recorded a positive performance in absolute terms as well as the existence of few extreme winners. The worst three-year median performance belongs to Spain and Germany. Examination of Table IV underlines that three-year holding period return distributions are skewed across the countries with few extreme winners dominating the mean return picture. The highest three-year total return of 8,900.0 percent, excluding the initial return of 4.4 percent, belongs to EM.TV AG, a German media company that was introduced in 1997 on the Neuer Markt as one of its first companies. This is followed by a three-year unadjusted return of 6,823.1 percent recorded by Mobilcom AG, the first company on the Neuer Markt, which jumped 52.0 percent on its first day of trading. The best French performer was Eurofins Scientific SA with a 2,247.8 percent three-year buy-and-hold return. Sylis SA, a 1997 IPO on the Second Marché, recorded a three-year raw return of 676.3 percent and an initial return of 14.3 percent. The best three-year performance of an Italian IPO belongs to Mediolanum SpA, an Italian Financial Services Company, with an unadjusted return of 346.5 percent, excluding the initial return of 30.8 percent. This is followed by Bulgari Spa, the international fashion and jewellery house that recorded an initial return of 5.7 percent and an unadjusted performance of 317.0 percent over three years. ASM Lithography NV, a 1995 IPO on the Amsterdam Exchanges, was the best Dutch performer. It returned 912.5 percent over three years, excluding the initial return of 22.6 percent. The second best Dutch performer was Baan NV, a software company, with a three-year unadjusted

Table IV

Distribution of unadjusted Three-Year Buy-And-Hold Returns

Distribution of unadjusted three-year holding period returns, exclusive of the initial returns, for IPOs in European countries between 1988 and 1998. Returns are measured as three-year unadjusted buy-and-hold returns. One month is defined as a consecutive 21-day trading interval after the first closing price using local trading days. Prices are adjusted for dividends, stock splits and rights offerings.

Three-year unadjusted holding period return																								
Germany			*France*			*Italy*			*The Netherlands*			*Spain*			*Sweden*			*Switzerland*					
Rank		IPOs	Rank		IPOs	Rank		IPOs	Rank		IPOs	Rank		IPOs	Rank		IPOs	Rank		IPOs			
1	(lowest)	-0.9123	1	(lowest)	-0.9491	1	(lowest)	-0.8748	1	(lowest)	-0.9865	1	(lowest)	-0.9948	1	(lowest)	-0.9455	1	(lowest)	-0.9865			
10		-0.6418	14		-0.7914	4		-0.6790	4		-0.6548	5		-0.8766	6		-0.7250	2		-0.5312			
19		-0.5890	27		-0.6962	7		-0.5891	7		-0.5537	9		-0.7784	12		-0.4293	4		-0.4872			
29		-0.4378	40		-0.5372	11		-0.4609	10		-0.5346	13		-0.7213	19		-0.3333	6		-0.3306			
39	(25th)	-0.3853	53	(25th)	-0.4193	15	(25th)	-0.2762	13	(25th)	-0.3976	17	(25th)	-0.6952	24	(25th)	-0.2571	8	(25th)	-0.2511			
49		-0.3308	67		-0.3316	18		-0.2544	17		-0.2384	21		-0.6160	30		-0.2151	10		-0.1579			
58		-0.2695	80		-0.1864	22		-0.1861	20		-0.1045	25		-0.5283	36		-0.1317	12		-0.1013			
68		-0.1848	92		-0.1047	25		-0.1157	23		0.0000	30		-0.4264	42		0.0284	14		0.0245			
78	(median)	-0.1323	107	(median)	-0.0283	30	(median)	-0.5700	26	(median)	0.0240	34	(median)	-0.3621	49	(median)	0.2676	16	(median)	0.0812			
87		-0.0528	120		0.0855	34		0.0966	29		0.2285	38		-0.2867	55		0.4445	18		0.4200			
97		0.0657	133		0.1698	38		0.1478	32		0.4948	43		-0.2229	61		0.5625	20		0.9241			
106		0.3652	146		0.4124	42		0.2877	36		0.7243	47		-0.0690	66		0.6170	21		0.9533			
116	(75th)	0.6049	160	(75th)	0.8869	45	(75th)	0.3510	39	(75th)	1.0086	51	(75th)	0.0799	72	(75th)	0.8733	23	(75th)	1.0227			
126		0.7535	173		1.2511	48		0.6507	42		1.3438	55		0.2175	79		1.3151	25		1.2810			
136		1.1216	187		1.7708	52		0.8801	46		2.0831	60		0.6593	86		1.6540	27		1.4113			
146		2.0478	200		2.3948	56		1.6319	49		2.9176	64		1.1939	92		3.6296	29		2.2388			
155	(highest)	89.0000	213	(highest)	22.4783	59	(highest)	3.4651	53	(highest)	9.1250	68	(highest)	7.8378	99	(highest)	10.1489	31	(highest)	4.2268			
All	(Mean)	1.3892	All	(Mean)	0.5369	All	(Mean)	0.1794	All	(Mean)	0.7369	All	(Mean)	-0.0465	All	(Mean)	0.7290	All	(Mean)	0.5595			
Ex.	Top 1%	0.1754	Ex.	Top 1%	0.3319	Ex.	Top 1%	0.1190	Ex.	Top 1%	0.5756	Ex.	Top 1%	-0.1642	Ex.	Top 1%	0.6329	Ex.	Top 1%	0.4373			
Ex.	Top 10%	-0.0314	Ex.	Top 10%	0.0584	Ex.	Top 10%	-0.0581	Ex.	Top 10%	0.2067	Ex.	Top 10%	-0.3501	Ex.	Top 10%	0.2195	Ex.	Top 10%	0.2937			

buy-and-hold return of 826.8 percent, excluding the initial return of 55.0 percent. Among the best of the Spanish performers was Tele Pizza SA, a Pizza home delivery service, with a three-year buy-and-hold return of 394.6 percent, excluding its initial return of 34.8 percent. Moreover, Compañía Vinícola del Norte de España SA, a Spanish Wine producer, had a first day return of 28.5 percent and a three-year raw performance of 119.4 percent. In Sweden, LGP Telecom AB, a technology company going public in June 1997 on the OTC list of the OM Stockholm Exchanges, ranked highest with an unadjusted return of 1,014.9 percent, excluding its initial return of 8.5 percent. Sigma AB, a technology company, ranked second highest, recording an unadjusted three-year buy-and-hold return of 962.8 percent, excluding the initial return of 62.3 percent. In the sample of Swiss IPOs, there were several IPOs that had triple-digit investment gains in the three years after their IPO. Clariant AG, a chemicals company, rose by 422.68 percent since its 1995 IPO, excluding the initial return of 0.7 percent. Moreover, Phoenix Mecano AG, an IPO on the Swiss market in September 1988, recorded an unadjusted return of 265.7 percent, excluding the initial return of 5.7 percent.

B. Cross-Sectional Performance Patterns

This section documents cross-sectional patterns in the aftermarket performance of IPOs. We perform this analysis for each individual country under study by segmenting the sample by a number of cross-sectional characteristics such as IPO year, sector, age, size, public float and initial return category. For each country, we conduct the analysis for initial and aftermarket returns. This permits examination as to whether initial and aftermarket performance are related to the issuing characteristics of the offer and allows for a more detailed look at IPO performance in general and pan-European IPO performance in particular.

As shown in Figure 2, the quantitative measurement of long-run IPO performance is sensitive to the benchmark employed. For evaluating the long-run performance of the IPOs in the sample, it is not at all clear what constitutes the appropriate benchmark portfolio. As mentioned earlier, the use of small- or mid-cap indices as benchmarks may bias the results in favour of finding no abnormal market-adjusted returns. Throughout the rest of the paper, we will therefore adjust IPO returns for movements in the broad-market value-weighted indices. While not capturing the complete picture of the market for small- and medium-sized stocks, broad-market indices also include large offerings similar to mature IPOs, privatization issues and equity carve-outs. We will also focus on reporting three-year wealth relatives (WR) as the primary measure of IPO aftermarket performance.

B.1. Germany

In Table V, we present evidence concerning the initial (Panel A) and long-run performance (Panel B) for the sample of German IPOs as a whole, and characterised according to a number of cross-sectional characteristics. Underpricing is a cyclical but consistent feature throughout the sample period and confirms the positive link between initial returns and the general level of the stock market. Only 4.57 percent of the IPOs in the sample experienced negative unadjusted initial returns. We also find that, when using buy-and-hold returns, average long-run returns for German IPOs were positive. This positive performance, however, is due to IPOs issued between 1995 and 1998. IPOs issued in "cold" markets during the early 1990s significantly underperform the market. For example, a strategy of investing in all IPOs issued during 1991 and 1994

Table V
Initial Returns and the Long-Run Performance of German IPOs

Descriptive statistics for the initial and long-run performance of German IPOs, categorized by IPO year, sector, age, size, public float (%) and initial return (%). New Economy firms belong to Market Sectors 5, 13, 16 and 17, representing Technology, Media, Telecommunication and Healthcare, respectively, in the attached Dow Jones STOXX global sector classification standard. Old Economy firms belong to all other sectors. Age is the year of going public minus the year of foundation, with firms founded before 1901 assumed to be founded in 1901. Size/Market Capitalization in DM millions is the number of shares issued times the final offer price (expressed in constant end-1998 prices). The initial return is the difference between the final offering price and the first-day closing price. Long-run returns are measured as mean three-year buy-and-hold returns (ex. the initial return) whereas three-years is defined as 36 consecutive 21-day trading intervals after the first close using local trading days. For example, for the oldest age category, the Wealth Relative of 0.756 is computed as 1.0311/1.3645.

Panel A: Initial Returns

Category	N	Mean	Median	Standard Deviation	S.E.	Percentage negative
IPO year 1988-1990	60	0.1209[a]	0.0547	0.23	(0.0296)	3.33
IPO year 1991-1994	43	0.0366[a]	0.0122	0.05	(0.0083)	3.17
IPO year 1995-1998	116	0.4083[a]	0.1250	0.62	(0.0574)	6.25
New Economy	57	0.5743[a]	0.1935	0.72	(0.0957)	1.75
Old Economy	162	0.1448[a]	0.0443	0.32	(0.0248)	5.56
Age < 15	87	0.4252[a]	0.1290	0.65	(0.0694)	4.60
15 ≤ Age < 37	51	0.2531[a]	0.0606	0.46	(0.0647)	5.88
Age ≥ 37	81	0.0776[a]	0.0421	0.13	(0.0142)	3.70
Small firms (<100m)	112	0.3174[a]	0.0730	0.58	(0.0545)	2.27
Medium firms (100-500m)	81	0.2287[a]	0.0607	0.43	(0.0475)	5.65
Large firms (>500m)	26	0.0816[a]	0.0695	0.09	(0.0168)	3.92
Public Float < 20	25	0.2463[a]	0.0920	0.36	(0.0720)	0.00
20 ≤ Public Float < 30	64	0.2804[a]	0.1250	0.44	(0.0544)	1.56
30 ≤ Public Float < 50	83	0.2976[a]	0.0526	0.61	(0.0672)	6.02
Public Float ≥ 50	47	0.1571[a]	0.0444	0.38	(0.0551)	8.51
All IPOs	219	0.2566[a]	0.0667	0.49	(0.0334)	4.57

Panel B: Long-Run Performance

Category	N	IPO return	FAZ Index return	Wealth Relative	S.E.	Percentage negative
IPO year 1988-1990	60	0.0157	0.0582	0.960	(0.0802)	65.00
IPO year 1991-1994	42	-0.0799	0.3139	0.700[a]	(0.0747)	76.19
IPO year 1995-1998	53	4.1083	0.8675	2.735	(2.1182)	66.04
New Economy	26	6.7516	0.4648	5.292	(4.1912)	50.00
Old Economy	129	0.3084	0.3920	0.940	(0.1817)	72.09
Age < 15	46	4.5868	0.5210	3.673[c]	(2.4201)	58.70
15 ≤ Age < 37	32	0.0605	0.3319	0.796[b]	(0.1299)	59.38
Age ≥ 37	77	0.0311	0.3645	0.756[a]	(0.0699)	77.92
Small firms (<100m)	32	3.1279	0.3612	3.032	(2.7667)	65.63
Medium firms (100-500m)	82	1.1093	0.4013	1.505	(0.8530)	71.95
Large firms (>500m)	41	0.5920	0.4437	1.103	(0.3296)	63.41
Public Float < 20	19	4.1598	0.5125	3.411	(3.5411)	63.16
20 ≤ Public Float < 30	43	0.4220	0.3193	1.078	(0.3112)	67.44
30 ≤ Public Float < 50	60	1.8751	0.3504	2.129	(1.5096)	63.33
Public Float ≥ 50	33	0.1709	0.5503	0.755[b]	(0.1815)	81.82
Initial Return ≤ 0	22	-0.0840	0.3982	0.655[a]	(0.1422)	90.91
0 < Initial Return < 7	69	1.4573	0.3955	1.761	(1.2793)	63.77
7 ≤ Initial Return < 20	43	0.4995	0.4396	1.042	(0.3153)	67.44
Initial Return ≥ 20	21	4.5306	0.3667	4.047	(3.2787)	61.90
All IPOs (Mean)	155	1.3892	0.4042	1.701	(0.7296)	68.39
All IPOs (Median)	155			0.728		

[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.

would have left the investor with only Deutsche Mark (DM) 0.700 relative to each DM invested in the FAZ Index. The underperformance is concentrated in older companies that also exhibit the lower initial returns. Companies in the New Economy, companies with a small public float and companies with higher initial returns perform substantially better. The findings in Table V also confirm that the median picture is substantially worse than the mean picture. In our sample, 68.39 percent of the companies underperformed the market with a median wealth relative of 0.728.

B.2. France

In Table VI, we summarize the findings on initial and aftermarket performance for the sample of French IPOs. There is significant underpricing, which, however, is less cyclical and lower than in some other countries. This may serve to highlight the efficiency of auction-like IPO mechanisms prevalent in France. Only 6.50 percent of companies had negative first -day initial returns. Contrary to Germany, IPOs issued in France between 1991 and 1994 overperformed the market. There is also significant long-term underperformance in Old Economy stocks that make up 70 percent of the sample. While the long-run average performance is negative, it is not statistically significant when assuming conventional measures of significance. The data also confirms a tendency for older companies and companies with a large public float to underperform the market and their younger counterparts in the long-run. 67.61 percent of IPOs in the sample underperformed the market, a value similar to one reported for Germany. A strategy of investing in the median French IPO at the end of the first day of trading, and holding it over 36 months, would have left the investor with only French Franc (FRF) 0.631 relative to each FRF invested in the SBF 250 Index.

B.3. Italy

Evidence on the performance of Italian IPOs is summarized in Table VII. Here, the following inferences can be drawn: First, Italian IPOs are underpriced on average by 13.03 percent. Underpricing, however, is less significant and more time-varying than for any other country in this study. Indeed, 20.78 percent of Italian IPOs had negative initial returns. Second, only seven percent of the companies under study were New Economy companies, a finding that offers a key insight about the composition of the Italian IPO market during the sample period. Moreover, our results also clearly confirm findings by Giudici and Paleari (1999) who distinguish two separate periods in which aftermarket performance varies substantially: a period up to 1989, when IPOs significantly overperformed the broad-market benchmark, and the remaining period that was characterized by strong underperformance. In our sample, the percentage of companies reporting underperformance rose from 52.63 percent between 1988 and 1990 to 84.85 percent between 1995 and 1998. Furthermore, the cross-sectional patterns exhibit a similar tendency to the patterns reported for Germany: there is a clear tendency for IPOs with higher initial returns and higher ownership retention rate to do better in the long-run. Finally, the low number of New Economy IPOs, which has been identified as the main driver behind the relatively favourable IPO performance in other countries, can explain the strong average and median underperformance of Italian IPOs.[18]

[18] During the early 1990s, a number of Italian companies such as Luxoticca Group, an eye-ware company, pursued their IPO on a foreign exchange, such as on the New York Stock Exchange (NYSE). Some of these shares substantially outperformed the market in the long-run.

Table VI
Initial Returns and the Long-Run Performance of French IPOs

Descriptive statistics for the initial and long-run performance of French IPOs, categorized by IPO year, sector, age, size, Public Float (%) and initial return (%). New Economy firms belong to Market Sectors 5, 13, 16 and 17, representing Technology, Media, Telecommunication and Healthcare, respectively, in the attached Dow Jones STOXX global sector classification standard. Old Economy firms belong to all other sectors. Age is the year of going public minus the year of foundation, with firms founded before 1901 assumed to be founded in 1901. Size/Market Capitalization in FRF billions is the number of shares issued times the final offer price (expressed in constant end-1998 prices). Long-run returns are measured as mean three-year buy-and-hold returns (ex. the initial return) whereas three-years is defined as 36 consecutive 21-day trading intervals after the first close using local trading days. For example, for the oldest age category, the Wealth Relative of 0.721 is computed as 1.0863/1.5059.

Panel A: Initial Returns

Category	N	Mean	Median	Standard Deviation	S.E.	Percentage negative
IPO year 1988-1990	37	0.0759[a]	0.0769	0.08	(0.0136)	0.00
IPO year 1991-1994	60	0.0869[a]	0.0323	0.13	(0.0169)	3.33
IPO year 1995-1998	226	0.1413[a]	0.0880	0.21	(0.0138)	8.41
New Economy	102	0.1533[a]	0.1000	0.22	(0.0216)	5.88
Old Economy	221	0.1100[a]	0.0556	0.17	(0.0114)	6.79
Age < 15	168	0.1299[a]	0.0698	0.21	(0.0165)	9.52
15 ≤ Age < 37	105	0.1352[a]	0.0833	0.17	(0.0166)	1.90
Age ≥ 37	50	0.0785[a]	0.0398	0.10	(0.0143)	6.00
Small firms (<0.33bn)	186	0.1236[a]	0.0790	0.20	(0.0145)	8.60
Medium firms (0.33-1.65bn)	101	0.1352[a]	0.0789	0.18	(0.0181)	0.99
Large firms (>1.65bn)	36	0.0922[a]	0.0286	0.14	(0.0236)	11.11
Public Float < 20	183	0.1216[a]	0.0827	0.16	(0.0115)	2.19
20 ≤ Public Float < 30	73	0.1452[a]	0.0769	0.23	(0.0272)	12.33
30 ≤ Public Float < 50	58	0.1159[a]	0.0260	0.22	(0.0292)	12.07
Public Float ≥ 50	9	0.0422[a]	0.0000	0.08	(0.0264)	11.11
All IPOs	323	0.1237[a]	0.0714	0.19	(0.0104)	6.50

Panel B: Long-Run Performance

Category	N	IPO return	SBF 250 Index return	*Wealth Relative*	S.E.	Percentage negative
IPO year 1988-1990	37	-0.0879	0.0369	0.880	(0.0800)	59.46
IPO year 1991-1994	60	0.4750	0.3190	1.118	(0.1381)	60.00
IPO year 1995-1998	116	0.7682	1.1899	0.807	(0.2603)	74.14
New Economy	64	1.0565	0.8161	1.132	(0.4293)	64.06
Old Economy	149	0.3137	0.7134	0.767[a]	(0.1049)	69.13
Age < 15	102	0.6181	0.7993	0.899	(0.2704)	70.59
15 ≤ Age < 37	71	0.6740	0.7995	0.930	(0.1961)	60.56
Age ≥ 37	40	0.0863	0.5059	0.721[a]	(0.1560)	72.50
Small firms (<0.33bn)	112	0.6933	0.8729	0.904	(0.2603)	68.75
Medium firms (0.33-1.65bn)	70	0.2771	0.6367	0.780[b]	(0.1456)	68.57
Large firms (>1.65bn)	31	0.5583	0.5226	1.023	(0.1983)	61.29
Public Float < 20	133	0.4450	0.6391	0.882	(0.1252)	63.91
20 ≤ Public Float < 30	43	1.1452	0.8571	1.155	(0.6002)	69.77
30 ≤ Public Float < 50	32	0.1451	1.0262	0.565[a]	(0.2214)	81.25
Public Float ≥ 50	5	0.2576	0.7676	0.711	(0.3446)	60.00
Initial Return ≤ 0	67	0.3856	0.6792	0.825	(0.1790)	73.13
0 < Initial Return < 7	39	1.1740	0.7888	1.215	(0.5926)	58.97
7 ≤ Initial Return < 20	64	0.5543	0.7078	0.910	(0.2437)	62.50
Initial Return ≥ 20	43	0.1688	0.8597	0.628[a]	(0.2014)	74.42
All IPOs (Mean)	213	0.5369	0.7443	0.881	(0.1481)	67.61
All IPOs (Median)	213			0.631		

[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.

Table VII
Initial Returns and the Long-Run Performance of Italian IPOs

Descriptive statistics for the initial and long-run performance of Italian IPOs, categorized by IPO year, sector, age, size, Public Float (%) and initial return (%). New Economy firms belong to Market Sectors 5, 13, 16 and 17, representing Technology, Media, Telecommunication and Healthcare, respectively, in the attached Dow Jones STOXX global sector classification standard. Old Economy firms belong to all other sectors. Age is the year of going public minus the year of foundation, with firms founded before 1901 assumed to be founded in 1901. Size/Market Capitalization in ITL billions is the number of shares issued times the final offer price (expressed in constant end-1998 prices). Long-run returns are measured as mean three-year buy-and-hold returns (ex. the initial return) whereas three-years is defined as 36 consecutive 21-day trading intervals after the first close using local trading days. For example, for the oldest age category, the Wealth Relative of 0.772 is computed as 1.2200/1.5794.

Panel A: Initial Returns

Category	N	Mean	Median	Standard Deviation	S.E.	Percentage negative
IPO year 1988-1990	21	0.2709[b]	0.1220	0.49	(0.1067)	28.57
IPO year 1991-1994	9	-0.0051	0.0000	0.11	(0.0364)	44.44
IPO year 1995-1998	47	0.0934[a]	0.0602	0.13	(0.0186)	12.77
New Economy	5	0.2197[b]	0.1010	0.21	(0.0959)	0.00
Old Economy	72	0.1241[a]	0.0535	0.29	(0.0344)	22.22
Age < 15	31	0.1630[b]	0.0500	0.36	(0.0655)	25.81
15 ≤ Age < 37	30	0.1141[a]	0.0842	0.16	(0.0301)	13.33
Age ≥ 37	16	0.0976	0.0236	0.31	(0.0781)	25.00
Small firms (<100bn)	9	0.2368[b]	0.0889	0.35	(0.1178)	22.22
Medium firms (100-500bn)	46	0.1400[a]	0.0551	0.32	(0.0473)	21.74
Large firms (>500bn)	22	0.0665[b]	0.0582	0.14	(0.0308)	18.18
Public Float < 20	6	-0.0099	-0.0062	0.06	(0.0254)	50.00
20 ≤ Public Float < 30	34	0.1848[a]	0.0996	0.39	(0.0677)	17.65
30 ≤ Public Float < 50	30	0.1225[a]	0.0792	0.16	(0.0297)	16.67
Public Float ≥ 50	7	0.0194	0.0081	0.08	(0.0313)	28.57
All IPOs	77	0.1303[a]	0.0593	0.29	(0.0327)	20.78

Panel B: Long-Run Performance

Category	N	IPO return	MIB Index return	*Wealth Relative*	S.E.	Percentage negative
IPO year 1988-1990	19	-0.0510	-0.1253	1.085	(0.1486)	52.63
IPO year 1991-1994	7	-0.4778	0.1734	0.445[a]	(0.1784)	100.00
IPO year 1995-1998	33	0.4515	1.2365	0.649[a]	(0.1554)	84.85
New Economy	4	0.1748	0.6421	0.715[b]	(0.1840)	100.00
Old Economy	55	0.2429	1.0807	0.597[a]	(0.2126)	74.55
Age < 15	22	0.1325	0.7108	0.662[a]	(0.1711)	81.82
15 ≤ Age < 37	25	0.2013	0.6819	0.714[b]	(0.2081)	76.00
Age ≥ 37	12	0.2200	0.5794	0.772[b]	(0.1687)	75.00
Small firms (<100bn)	6	0.2846	0.8721	0.686	(0.6386)	83.33
Medium firms (100-500bn)	36	0.0342	0.6644	0.621[a]	(0.1102)	75.00
Large firms (>500bn)	17	0.4500	0.6168	0.897	(0.2224)	76.47
Public Float < 20	6	0.5385	0.7328	0.888	(0.1304)	66.67
20 ≤ Public Float < 30	27	0.0619	0.3671	0.777[c]	(0.1806)	70.37
30 ≤ Public Float < 50	20	0.3064	0.9974	0.654[a]	(0.1963)	80.00
Public Float ≥ 50	6	-0.0740	0.8972	0.488[a]	(0.2416)	100.00
Initial Return ≤ 0	14	-0.0176	0.4736	0.667[a]	(0.1178)	85.71
0 < Initial Return < 7	15	0.2303	0.8849	0.653[b]	(0.2547)	80.00
7 ≤ Initial Return < 20	15	0.2635	0.9203	0.658[a]	(0.1747)	73.33
Initial Return ≥ 20	15	0.2284	0.3953	0.880	(0.2980)	66.67
All IPOs (Mean)	59	0.1794	0.6718	0.705[a]	(0.1127)	76.27
All IPOs (Median)	59			0.669		

[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.

B.4. The Netherlands

In Table VIII, we present evidence concerning the performance of Dutch IPOs. There is significant underpricing that depends on either the market condition at the time of going public or the sector. Only 8.00 percent of the IPOs recorded negative unadjusted initial returns. The long-run performance picture is similar to the one reported for Germany: On average, IPOs have overperformed the market. This overperformance is driven by New Economy stocks, which make up 31 percent of the sample. While an investment in the sample of New Economy IPOs leaves the average investor with Dutch Guilder (NLG) 1.373 relative to each NLG invested in the CBS Index over three years, an investment in Old Economy IPOs leaves the average investor with only 0.868 NLG relative to each NLG invested in the CBS Index. There is also a positive link between offering retention, initial return and long-run performance. We also note that, unlike for Italy, the average and median IPO long-run performance is clearly different, thus underlying the higher probability of finding extremely positive returns in New Economy IPOs, which made up a large percentage of IPOs. Of all the companies, 66.04 percent recorded negative long-run market adjusted performance, a result similar to the one presented for Germany and France.

B.5. Spain

We report the results for IPOs issued on the Madrid Stock Exchange in Table IX. The findings are similar to the one presented for IPOs issued on the Milan Stock Exchange. There is significant underpricing which is higher in rising stock markets than in stable and falling stock markets. For the sample as a whole, 7.95 percent recorded negative returns based on the closing price after the first day of trading. Companies from Old Economy sectors dominate the Spanish IPO market during the sample period. Less than four percent of companies are from New Economy sectors. When evaluating aftermarket performance, we can clearly distinguish between two periods: First, a period up to 1990, in which IPOs substantially underperform the market. This period is characterised by regulatory changes following the Spanish Securities Market Reform Act of 1989. Over three years, a strategy of investing in the sample of Spanish IPOs between 1988 and 1990 would have left the average investor with only Spanish Pesetas (ESP) 0.755 relative to each ESP invested in the Madrid General Index (IGBM). Second, the period from 1991 and 1998 was characterized by subdued IPO activity and generally a more favourable long-run performance picture of the companies going public. The results also confirm the signaling role of underpricing for the Spanish IPO market. Looking at the sample as a whole, the mean and median long-run performance of Spanish IPO is dismal, with 82.35 percent of companies underperforming the market benchmark. This could be partly due to the absence of IPOs in New Economy sectors.

B.6. Sweden

In Table X, we display the results for the initial and long-run performance of Swedish IPOs. The overall long-run performance of Swedish IPOs was mixed with 71.72 percent of the IPOs underperforming the market after three years. Without IPOs in New Economy sectors, the average long-run IPO performance would have been dismal. The 148 Swedish IPOs record an average underpricing of 18.46 percent, with 13.51 percent trading in negative territory based on their first close. Underpricing was highest between 1988 and 1990. None of the 26 IPOs between 1988 and 1990 recorded

Table VIII
Initial Returns and the Long-Run Performance of Dutch IPOs

Descriptive statistics for the initial and long-run performance of Dutch IPOs, categorized by IPO year, market sector, age, size, Public Float (%) and initial return (%). New Economy firms belong to Sectors 5, 13, 16 and 17, representing Technology, Media, Telecommunication and Healthcare, respectively, in the attached Dow Jones STOXX global sector classification standard. Old Economy firms belong to all other sectors. Age is the year of going public minus the year of foundation, with firms founded before 1901 assumed to be founded in 1901. Size/Market Capitalization in NLG millions is the number of shares issued times the final offer price (expressed in constant end-1998 prices). Long-run returns are measured as mean three-year buy-and-hold returns (ex. the initial return) whereas three-years is defined as 36 consecutive 21-day trading intervals after the first close using local trading days. For example, for the oldest age category, the Wealth Relative of 0.829 is computed as 1.4695/1.7722.

Panel A: Initial Returns

Category	N	Mean	Median	Standard Deviation	S.E.	Percentage negative
IPO year 1988-1990	17	0.0644[a]	0.0250	0.09	(0.0224)	21.43
IPO year 1991-1994	11	0.0116[a]	0.0068	0.01	(0.0038)	0.00
IPO year 1995-1998	47	0.1888[a]	0.0780	0.26	(0.0384)	6.38
New Economy	30	0.1964[a]	0.0479	0.29	(0.0521)	3.33
Old Economy	45	0.0934[a]	0.0317	0.16	(0.0241)	11.11
Age < 15	27	0.1683[a]	0.0828	0.25	(0.0471)	7.41
15 ≤ Age < 37	27	0.1641[a]	0.0741	0.26	(0.0503)	3.70
Age ≥ 37	21	0.0534[a]	0.0239	0.09	(0.0204)	14.29
Small firms (<113m)	17	0.2117[a]	0.0828	0.30	(0.0730)	11.76
Medium firms (113-550m)	31	0.1156[a]	0.0263	0.24	(0.0428)	12.90
Large firms (>550m)	27	0.1079[a]	0.0590	0.13	(0.0245)	0.00
Public Float < 20	20	0.1441[a]	0.0323	0.24	(0.0538)	5.00
20 ≤ Public Float < 30	13	0.2021[b]	0.0250	0.34	(0.0949)	15.38
30 ≤ Public Float < 50	20	0.1349[a]	0.0683	0.21	(0.0465)	5.00
Public Float ≥ 50	22	0.0859[a]	0.0345	0.12	(0.0248)	9.09
All IPOs	75	0.1346[a]	0.0333	0.22	(0.0259)	8.00

Panel B: Long-Run Performance

Category	N	IPO return	CBS Index return	*Wealth Relative*	S.E.	Percentage negative
IPO year 1988-1990	17	0.0296	0.1844	0.869	(0.4074)	57.89
IPO year 1991-1994	11	0.4455	0.7175	0.842	(0.2495)	77.78
IPO year 1995-1998	25	1.3460	0.9670	1.193	(0.5493)	68.00
New Economy	17	1.4789	0.8056	1.373	(0.6412)	58.82
Old Economy	36	0.3865	0.5974	0.868	(0.2268)	69.44
Age < 15	18	1.1299	0.6651	1.279	(0.5884)	50.00
15 ≤ Age < 37	18	0.5964	0.5613	1.022	(0.3191)	77.78
Age ≥ 37	17	0.4695	0.7722	0.829	(0.1978)	70.59
Small firms (<113m)	12	1.1578	0.3696	1.575	(0.5186)	33.33
Medium firms (113-550m)	18	0.2512	0.6354	0.765[c]	(0.1991)	72.22
Large firms (>550m)	23	0.8974	0.8405	1.031	(0.5690)	78.26
Public Float < 20	16	1.8536	0.6981	1.680	(0.7089)	56.25
20 ≤ Public Float < 30	8	0.4678	0.3716	1.070	(0.1503)	37.50
30 ≤ Public Float < 50	13	0.0001	0.6100	0.621[b]	(0.2401)	84.62
Public Float ≥ 50	16	0.3533	0.8206	0.743[b]	(0.1877)	75.00
Initial Return ≤ 0	11	0.3486	0.3945	0.967	(0.2869)	54.55
0 < Initial Return < 7	21	0.6089	0.7589	0.915	(0.3061)	76.19
7 ≤ Initial Return < 20	9	0.1234	0.4853	0.756	(0.3067)	77.78
Initial Return ≥ 20	12	1.7769	0.8799	1.477	(0.8881)	50.00
All IPOs (Mean)	53	0.7369	0.6642	1.044	(0.2796)	66.04
All IPOs (Median)	53			0.737		

[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.

Table IX
Initial Returns and the Long-Run Performance of Spanish IPOs

Descriptive statistics for the initial and long-run performance of Spanish IPOs, categorized by IPO year, sector, age, size, Public Float (%) and initial return (%). New Economy firms belong to Market Sectors 5, 13, 16 and 17, representing Technology, Media, Telecommunication and Healthcare, respectively, in the attached Dow Jones STOXX global sector classification standard. Old Economy firms belong to all other sectors. Age is the year of going public minus the year of foundation, with firms founded before 1901 assumed to be founded in 1901. Size/Market Capitalization in ESP billions is the number of shares issued times the final offer price (expressed in constant end-1998 prices). Long-run returns are measured as mean three-year buy-and-hold returns (ex. the initial return) whereas three-years is defined as 36 consecutive 21-day trading intervals after the first close using local trading days. For example, for the oldest age category, the Wealth Relative of 0.696 is computed as 0.9510/1.3659.

Panel A: Initial Returns

Category	N	Mean	Median	Standard Deviation	S.E.	Percentage negative
IPO year 1988-1990	46	0.1650[a]	0.0835	0.24	(0.0350)	2.17
IPO year 1991-1994	18	0.0064	0.0128	0.10	(0.0237)	27.78
IPO year 1995-1998	24	0.2197[a]	0.0853	0.29	(0.0600)	4.17
New Economy	3	0.3182[b]	0.3165	0.26	(0.1515)	0.00
Old Economy	85	0.1414[a]	0.0764	0.24	(0.0263)	8.24
Age < 15	14	0.1146[a]	0.0590	0.12	(0.0318)	0.00
15 ≤ Age < 37	38	0.1821[a]	0.1055	0.28	(0.0454)	10.53
Age ≥ 37	36	0.1237[a]	0.0646	0.24	(0.0400)	8.33
Small firms (<7bn)	14	0.1691[b]	0.0680	0.31	(0.0833)	0.00
Medium firms (7-33bn)	45	0.1577[a]	0.0764	0.26	(0.0387)	8.89
Large firms (>33bn)	29	0.1211[a]	0.0797	0.18	(0.0335)	10.34
Public Float < 20	11	0.0887[b]	0.0444	0.14	(0.0411)	0.00
20 ≤ Public Float < 30	18	0.1001[a]	0.0799	0.15	(0.0358)	11.11
30 ≤ Public Float < 50	40	0.1478[a]	0.1150	0.18	(0.0284)	10.00
Public Float ≥ 50	19	0.2258[b]	0.0716	0.42	(0.0961)	5.26
All IPOs	88	0.1475[a]	0.0781	0.24	(0.0260)	7.95

Panel B: Long-Run Performance

Category	N	IPO return	IGBM Index return	*Wealth Relative*	S.E.	Percentage negative
IPO year 1988-1990	37	-0.4826	-0.1255	0.592[a]	(0.0589)	81.08
IPO year 1991-1994	14	0.0977	0.4334	0.766[a]	(0.1190)	85.71
IPO year 1995-1998	17	0.7840	0.9658	0.907	(0.4545)	82.35
New Economy	2	-0.0367	0.2806	0.752	(0.5202)	50.00
Old Economy	66	-0.3705	-0.3362	0.948[a]	(0.0133)	83.33
Age < 15	11	-0.0651	0.1044	0.847	(0.3027)	72.73
15 ≤ Age < 37	30	-0.0375	0.2272	0.784	(0.2282)	86.67
Age ≥ 37	27	-0.0490	0.3659	0.696[a]	(0.1137)	81.48
Small firms (<7bn)	12	0.2739	0.1981	1.063	(0.5414)	75.00
Medium firms (7-33bn)	32	-0.1721	0.2408	0.667[a]	(0.1449)	84.38
Large firms (>33bn)	24	-0.0393	0.3233	0.726[a]	(0.0841)	83.33
Public Float < 20	10	0.3279	0.4430	0.920	(0.1265)	70.00
20 ≤ Public Float < 30	14	-0.2643	0.1337	0.649[b]	(0.1723)	78.57
30 ≤ Public Float < 50	29	-0.2775	0.0954	0.660[a]	(0.1147)	89.66
Public Float ≥ 50	15	0.3537	0.5851	0.854	(0.4722)	80.00
Initial Return ≤ 0	12	-0.4100	0.0831	0.545[a]	(0.0736)	91.67
0 < Initial Return < 7	18	-0.0001	0.3215	0.757[a]	(0.1157)	72.22
7 ≤ Initial Return < 20	18	-0.3256	0.2322	0.547[a]	(0.1007)	94.44
Initial Return ≥ 20	20	0.3810	0.3441	1.027	(0.3690)	75.00
All IPOs (Mean)	68	-0.0465	0.2624	0.755[a]	(0.1193)	82.35
All IPOs (Median)	68			0.553		

[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.

Table X
Initial Returns and the Long-Run Performance of Swedish IPOs

Descriptive statistics for the initial and long-run performance of Swedish IPOs, categorized by IPO year, sector, age, size, Public Float (%) and initial return (%). New Economy firms belong to Market Sectors 5, 13, 16 and 17, representing Technology, Media, Telecommunication and Healthcare, respectively, in the attached Dow Jones STOXX global sector classification standard. Old Economy firms belong to all other sectors. Age is the year of going public minus the year of foundation, with firms founded before 1901 assumed to be founded in 1901. Size/Market Capitalization in SEK billions is the number of shares issued times the final offer price (expressed in constant end-1998 prices). Long-run returns are measured as mean three-year buy-and-hold returns (ex. the initial return) whereas three-years is defined as 36 consecutive 21-day trading intervals after the first close using local trading days. For example, for the oldest age category, the Wealth Relative of 1.070 is computed as 1.8417/1.7211.

Panel A: Initial Returns

Category	N	Mean	Median	Standard Deviation	S.E.	Percentage negative
IPO year 1988-1990	26	0.2618[a]	0.1755	0.23	(0.0457)	0.00
IPO year 1991-1994	41	0.1178[a]	0.0568	0.21	(0.0334)	21.95
IPO year 1995-1998	81	0.1937[a]	0.0846	0.32	(0.0358)	13.58
New Economy	55	0.2629[a]	0.1474	0.29	(0.0390)	5.45
Old Economy	93	0.1383[a]	0.0714	0.27	(0.0281)	18.28
Age < 15	76	0.1997[a]	0.0961	0.27	(0.0306)	13.16
15 ≤ Age < 37	33	0.1752[a]	0.1000	0.22	(0.0377)	3.03
Age ≥ 37	39	0.1634[a]	0.0500	0.36	(0.0577)	23.08
Small firms (<0.4bn)	84	0.2204[a]	0.1027	0.32	(0.0346)	11.90
Medium firms (0.4-2.0bn)	48	0.1232[a]	0.0508	0.21	(0.0304)	18.37
Large firms (>2.0bn)	16	0.1810[a]	0.0902	0.27	(0.0680)	6.67
Public Float < 20	26	0.2407[a]	0.1841	0.22	(0.0434)	7.69
20 ≤ Public Float < 30	37	0.3278[a]	0.1446	0.41	(0.0676)	2.70
30 ≤ Public Float < 50	42	0.1361[a]	0.0823	0.23	(0.0354)	16.67
Public Float ≥ 50	43	0.0750[a]	0.0500	0.15	(0.0225)	23.26
All IPOs	148	0.1846[a]	0.0866	0.28	(0.0233)	13.51

Panel B: Long-Run Performance

Category	N	IPO return	AFG Index return	*Wealth Relative*	S.E.	Percentage negative
IPO year 1988-1990	22	-0.2906	-0.0289	0.731[a]	(0.0798)	77.27
IPO year 1991-1994	32	0.4835	0.9123	0.776[a]	(0.1218)	81.25
IPO year 1995-1998	45	1.4020	1.1286	1.128	(0.3695)	62.22
New Economy	30	1.5212	0.9592	1.287	(0.4887)	60.00
Old Economy	69	0.3846	0.7329	0.799[a]	(0.1231)	76.81
Age < 15	46	0.7928	0.8842	0.952	(0.2688)	69.57
15 ≤ Age < 37	22	0.4368	0.7419	0.825	(0.2564)	77.27
Age ≥ 37	31	0.8417	0.7211	1.070	(0.3446)	70.97
Small firms (<0.4bn)	52	0.9782	0.7905	1.105	(0.3077)	69.23
Medium firms (0.4-2.0bn)	35	0.4692	0.8851	0.779[b]	(0.1677)	77.78
Large firms (>2.0bn)	12	0.4071	0.6051	0.877	(0.1414)	63.64
Public Float < 20	19	1.2267	0.7956	1.240	(0.4899)	73.68
20 ≤ Public Float < 30	24	0.4439	0.6520	0.874	(0.2020)	62.50
30 ≤ Public Float < 50	26	1.0572	0.9014	1.082	(0.5026)	65.38
Public Float ≥ 50	30	0.3575	0.8382	0.739[a]	(0.1498)	83.33
Initial Return ≤ 0	19	0.7819	1.1597	0.825	(0.3498)	84.21
0 < Initial Return < 7	24	0.3794	0.7821	0.774[b]	(0.1927)	75.00
7 ≤ Initial Return < 20	26	0.9686	0.7319	1.137	(0.4552)	69.23
Initial Return ≥ 20	30	0.7676	0.6504	1.071	(0.3256)	63.33
All IPOs (Mean)	99	0.7290	0.8015	0.960	(0.1768)	71.72
All IPOs (Median)	99			0.726		

[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.

Table XI
Initial Returns and the Long-Run performance of Swiss IPOs

Descriptive statistics for the initial and long-run performance of Swiss IPOs, categorized by IPO year, sector, age, size, Public Float (%) and initial return (%). New Economy firms belong to Market Sectors 5, 13, 16 and 17, representing Technology, Media, Telecommunication and Healthcare respectively in the attached Dow Jones STOXX global sector classification standard. Old Economy firms belong to all other sectors. Age is the year of going public minus the year of foundation, with firms founded before 1901 assumed to be founded in 1901. Size/Market Capitalization in CHF millions is the number of shares issued times the final offer price (expressed in constant end-1998 prices). Long-run returns are measured as mean three-year buy-and-hold returns (ex. the initial return) whereas three-years is defined as 36 consecutive 21-day trading intervals after the first close using local trading days. For example, for the oldest age category, the Wealth Relative of 0.835 is computed as 1.4691/1.7601.

Panel A: Initial Returns

Category	N	Mean	Median	Standard Deviation	S.E.	Percentage negative
IPO year 1988-1990	10	0.0343	0.0149	0.07	(0.0216)	30.00
IPO year 1991-1994	4	0.0908[a]	0.0882	0.07	(0.0349)	0.00
IPO year 1995-1998	29	0.1196[a]	0.0489	0.17	(0.0319)	10.34
New Economy	18	0.1444[a]	0.1169	0.16	(0.0387)	16.67
Old Economy	25	0.0629[b]	0.0227	0.13	(0.0260)	12.00
Age < 15	17	0.0965[b]	0.0400	0.18	(0.0431)	23.53
15 ≤ Age < 37	13	0.1120[a]	0.0765	0.10	(0.0264)	7.69
Age ≥ 37	13	0.0829[c]	0.0194	0.16	(0.0451)	3.85
Small firms (<80m)	6	0.0642[b]	0.0438	0.08	(0.0319)	0.00
Medium firms (80-450m)	28	0.1235[a]	0.0529	0.17	(0.0329)	17.86
Large firms (>450m)	9	0.0368[c]	0.0194	0.06	(0.0203)	11.11
Public Float < 20	2	0.0496[c]	0.0496	0.04	(0.0270)	0.00
20 ≤ Public Float < 30	2	0.1301	0.1301	0.15	(0.1033)	0.00
30 ≤ Public Float < 50	10	0.1377[b]	0.0854	0.18	(0.0567)	0.00
Public Float ≥ 50	29	0.0841[a]	0.0375	0.15	(0.0271)	20.69
All IPOs	43	0.0971[a]	0.0400	0.15	(0.0228)	13.95

Panel B: Long-Run Performance

Category	N	IPO return	STM Index return	*Wealth Relative*	S.E.	Percentage negative
IPO year 1988-1990	10	0.2754	0.1997	1.063	(0.3785)	70.00
IPO year 1991-1994	4	0.8104	0.9888	0.910	(0.4351)	75.00
IPO year 1995-1998	17	0.6676	0.8422	0.905	(0.2459)	64.71
New Economy	12	0.7337	0.7534	0.989	(0.2814)	66.67
Old Economy	19	0.4495	0.5910	0.911	(0.2398)	68.42
Age < 15	13	0.5727	0.6278	0.966	(0.3061)	69.23
15 ≤ Age < 37	9	0.6309	0.5852	1.029	(0.2539)	55.56
Age ≥ 37	9	0.4691	0.7601	0.835	(0.3932)	77.78
Small firms (<80m)	6	-0.1098	0.4164	0.628[c]	(0.2726)	83.33
Medium firms (80-450m)	19	0.6779	0.6889	0.993	(0.2200)	63.16
Large firms (>450m)	6	0.8539	0.7803	1.041	(0.5257)	66.67
Public Float < 20	1	-0.1579	0.2933	0.651	-	100.00
20 ≤ Public Float < 30	1	0.9913	1.1113	0.943	-	100.00
30 ≤ Public Float < 50	8	1.1413	0.8974	1.129	(0.4435)	50.00
Public Float ≥ 50	21	0.3515	0.5564	0.868	(0.2134)	71.43
Initial Return ≤ 0	5	0.5664	0.4028	1.117	(0.4195)	80.00
0 < Initial Return < 7	15	0.5731	0.6100	0.977	(0.3075)	66.67
7 ≤ Initial Return < 20	6	0.7013	0.9044	0.893	(0.3627)	66.67
Initial Return ≥ 20	5	0.3415	0.7355	0.773	(0.4062)	60.00
All IPOs (Mean)	31	0.5595	0.6538	0.943	(0.1849)	67.74
All IPOs (Median)	31			0.774		

[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.

a negative initial return. This can be explained by the fact that underpricing up until 1990 was driven by an incentive to replace salary increases by tax efficient capital gains. Another important feature of the Swedish IPO market is that 37 percent of Swedish IPOs during the sample period belong to the New Economy sectors, the highest compared to the other six countries in this study. Most of the New Economy stocks went public between 1995 and 1997, which is strongly apparent when dividing IPO performance by IPO year. For example, a strategy of investing in the basket of Swedish IPOs between 1991 and 1994 at the first closing price and then holding them over a three-year period, would have left the investor with only Swedish Krona (SEK) 0.776 relative to each SEK invested in the AFG Index. In contrast, Swedish IPOs issued between 1995 and 1998 rose, on average, by 140.20 percent over three years while the AFG Index recorded a rise of 112.86 percent, a ratio of 1.128. The results displayed in Table X also verify our previous observations that the magnitude of long-run performance is sensitive to the size of the public float and the degree of underpricing.

B.7. Switzerland

In Table XI, we present evidence concerning the performance of Swiss IPOs going public on the respective market segments of the SWX stock exchange between 1988 and 1998. We cannot reject that Swiss IPOs were underpriced, on average, across the sample period. However, the recorded degree of underpricing is markedly lower than for other European countries across the sample period. An interesting feature of the Swiss IPO market is the large number of New Economy IPOs that drive both initial and long-run aftermarket returns. For the sample as a whole, we do not find significant long-run underperformance. Of all the IPOs in the sample, 67.74 percent recorded negative market adjusted returns in the long-run, a number slightly lower than reported for other European countries. Owning to the small sample sizes, it is difficult to draw inferences about the explanatory power of cross-sectional characteristics and long-run aftermarket performance of Swiss IPOs.

IV. Checks for the Robustness of Performance Differences

In order to investigate the patterns in IPO performance across countries, we measure the significance of country-by-country performance differences. This analysis is performed for 21 country pairs for the sample as a whole and for IPOs categorized by the issuing characteristics identified above using the conventional two samples test for Mean Difference. Moreover, because the results may be biased because of the skewness of the return distributions, we perform further robustness checks using the nonparametric Wilcoxon rank sum test.

In Table XII, we report the result for the significance of differences in initial returns. The findings confirm our earlier observation. While significantly higher underpricing of Swedish IPOs offered between 1988 and 1990 indicates the effect of underpricing as tax-efficient compensation of management, the large number of young companies going public during 1998 explains the significantly higher level of underpricing for German IPOs, when compared to their European counterparts. German and Swedish underpricing was particularly significantly different when compared to France. This underlines the effect of certain IPO mechanisms that are relatively unique to the French IPO market during the sample period. For other country pairs, the results do not indicate a significant difference in underpricing.

Table XII

Test for Significance of Initial Return Differences

In each Panel, we measure whether the adjusted initial return performance in one country is significantly different from the adjusted long-run IPO performance in another country. This analysis is performed for 21 country pairs using the conventional two samples test for Mean Difference and the nonparametric Wilcoxon rank sum test. The initial return (IR) is the percentage difference between the final offering price and the first-day closing price. Significance values correspond to p-values.

Tests for significance of Initial Returns (IR) Differences

Country	IR	Conventional two samples test for Mean Difference (p-value)						
		BD	FR	IT	NL	ES	SD	SW
Germany (BD)	0.2566		0.0000	0.0348	0.0396	0.0489	0.1098	0.3690
France (FR)	0.1237			0.8034	0.6613	0.3243	0.0059	0.3704
Italy (IT)	0.1303				0.9185	0.6790	0.1764	0.4811
Netherlands (NL)	0.1346					0.7282	0.1847	0.3288
Spain (ES)	0.1475						0.3071	0.2158
Sweden (SD)	0.1846							0.0533
Switzerland (SW)	0.0971							
Country	IR	Nonparametric Wilcoxon rank sum test (p-value)						
		BD	FR	IT	NL	ES	SD	SW
Germany (BD)	0.2566		0.0296	0.0729	0.1044	0.6884	0.4381	0.0751
France (FR)	0.1237			0.6488	0.9817	0.3350	0.0273	0.5481
Italy (IT)	0.1303				0.7137	0.2950	0.0569	0.9172
Netherlands (NL)	0.1346					0.3256	0.0466	0.6464
Spain (ES)	0.1475						0.2960	0.1675
Sweden (SD)	0.1846							0.0295
Switzerland (SW)	0.0971							

Findings for the significance in long-run performance differences between IPOs in the seven European countries under study are shown in Table XIII. Of the 21 country pairs, 17 do not indicate significant differences in long-run IPO performance. An exception is the sample of German IPOs, which, on average, have substantially outperformed French IPOs. Much like for Initial Returns, this is due to the favourable performance of German IPOs issued during the late 1990s. Italy ranks lowest in the long-run performance ranking. It substantially underperformed most of the other countries in the study, which, as argued earlier, is due to the lack of IPO activity in the New Economy sectors in this market.

The analysis of cross-sectional results for the significance in performance differences across the seven European countries also helps to shed some more light on some of the cross-sectional findings reported earlier. While not reported separately, we also conduct significance tests by categorizing IPOs in each of the seven countries according to the issuing characteristic at the IPO date. We infer that the significantly negative performance of Spanish IPOs was an isolated event limited to IPOs issued between 1988 and 1990, a time when changes in Spain's securities markets law facilitated the process of going public. Moreover, tests for New Economy IPOs indicate insignificant performance differences across countries. The same result applies when comparing the significance of performance differences of IPOs categorized by issuing characteristics such as Old Economy sector, oldest age category or largest size.

Table XIII

Test for Significance of Long-Run Return Differences

In each Panel, we measure whether the adjusted long-run IPO performance in one country is significantly different from the adjusted long-run IPO performance in another country. This analysis is performed for 21 country pairs using the conventional two-sample test for Mean Difference and the nonparametric Wilcoxon rank sum test. Long-run returns are measured as broad-market adjusted mean three-year buy-and-hold returns (BHR_T) whereas three years is defined as 36 consecutive 21-day trading intervals using local trading days. Significance values correspond to p-values.

Tests for significance of Long-Run Performance (BHR_T) Differences

Country	BHR_T	Conventional two samples test for Mean Difference (p-value)						
		BD	FR	IT	NL	ES	SD	SW
Germany (BD)	0.9850		0.0664	0.1999	0.4667	0.2446	0.2550	0.5118
France (FR)	-0.2074			0.2293	0.3991	0.7086	0.5869	0.7753
Italy (IT)	-0.5584				0.0222	0.1441	0.0499	0.0305
Netherlands (NL)	0.0649					0.1502	0.6480	0.6554
Spain (ES)	-0.3089						0.3116	0.3223
Sweden (SD)	-0.0725							0.9471
Switzerland (SW)	-0.0943							
Country	BHR_T	Nonparametric Wilcoxon rank sum test (p-value)						
		BD	FR	IT	NL	ES	SD	SW
Germany (BD)	0.9850		0.0261	0.0158	0.6398	0.2611	0.2565	0.9098
France (FR)	-0.2074			0.5102	0.1872	0.4764	0.2786	0.1615
Italy (IT)	-0.5584				0.0908	0.2084	0.1383	0.0782
Netherlands (NL)	0.0649					0.8345	0.7337	0.7386
Spain (ES)	-0.3089						0.9844	0.5043
Sweden (SD)	-0.0725							0.4314
Switzerland (SW)	-0.0943							

As argued earlier, we also found a tendency for companies that retained the least at the IPO date to underperform the most in the long-run. Significance tests also confirm underperformance of companies with the highest public float at the IPO date. The result is not driven by one single country, but extends across all countries in this study. A slightly different picture emerges when categorizing long-run returns according to the initial returns category. While there is a cl

Trading Day Calendar resulting in different sample sizes for returns measurement and the conversion of stock prices into Euro (€) when appropriate at the individual country level - the choice of a pan-European benchmark index versus a local benchmark index with a potentially large divergence in sector weightings has a clear influence on the results.

V. Summary and Conclusion

In this paper, we have analysed the short- and long-run performance of Initial Public Offerings (IPOs) in seven individual European countries between 1988 and 1998, a time characterized by a rapid change. In all countries, companies going public were significantly underpriced. Average initial returns are also related to age and the percentage of New Economy stocks of total IPO activity. In each country under study, there appears to be a close link between IPO activity, the level of underpricing and the general level of the stock market. Moreover, the results point to the effects of tax incentives (in the case of Sweden or France), the IPO mechanism (in the case of France) and changes in the regulatory environment (in the case of Spain) on the level of underpricing and IPO activity.

The long-run aftermarket performance of IPOs issued in the seven European countries is mixed. We find that a strategy of investing in IPOs at the end of the first day of trading, and holding them over a three-year period, would have left the investor in German IPOs with DM1.701 relative to each DM invested in the FAZ Index, and the investor in Dutch IPOs with NLG1.044 relative to each NLG invested in the CBS Index. Investors in other countries would have underperformed the market: the investor in Swedish IPOs would have been left with only SEK0.960 to each SEK invested in the AFG Index, the investor in Swiss IPOs would have been left with CHF0.943 relative to each CHF invested in the STM Index, and the investor in French IPOs with FRF0.881 relative to each FRF invested in the SBF 250 Index. Spanish and Italian IPOs fared the worst: an investment in the sample of Spanish IPOs resulted in ESP0.755 for each ESP invested in the IGBM Index after three years. The investor in Italian IPOs would have been left with only ITL0.705 for each ITL invested in the MIB Historical Index over three years.

We have also shown that aftermarket performance is sensitive to benchmark adjustment and return methodology. In the countries under study, returns on IPOs were more favourable when adjusted for movements in small- or mid-cap indices, when available. We also found that the use of cumulative average returns (CARs) results in a more negative long-run performance picture when compared to buy-and-hold returns (BHRs). An analysis of CARs of German, Dutch and Swedish IPOs indicates strong overperformance during the first months on the stock market. Capturing the positive returns in the countries faring best depends on the investor's ability of finding the extreme winner. This describes the essence of the IPO market.

For each individual country, we have also documented various cross-sectional patterns in long-run performance by segmenting IPOs according to a number of issuing characteristics. When categorizing performance according to the public float at the IPO date, for example, we find that companies retaining the least amount of equity at the IPO date perform particularly poorly. We also show that the relatively favourable average return picture is driven by the outperformance of IPOs in sectors representing the New Economy. This applies to Germany, France, The Netherlands, Sweden and Switzerland, the five countries with significant New Economy IPO activity during the

sample period. Stock exchanges in countries that did not manage to cater to companies in New Economy sectors during the sample period via New Market segments, such as Italy or Spain, did the worst. Moreover, the poor performance of Old Economy IPOs relative to the market and their New Economy peers is not an isolated event as it extends to all countries under study. Significance tests of performance differences indicate broad similarity in underpricing and long-run return behaviour of IPOs in the seven countries under study, which underlines the homogeneity of the European IPO market and the pervasiveness of the reported long-run IPO patterns.

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Table AI
Listing Requirements on European Market Segments

These minimum listing requirements were in effect during 2001 and are also broadly applicable to the study period between 1988 and 1998. The number in parenthesis corresponds to the number of IPOs in the sample. This study does not include issues on the Italian Nuovo Mercato, Spanish Nuevo Mercado and SWX Swiss New Market. The Swedish *New Market* section includes IPOs going public on Aktietorget Norden AB and SBI AB.

Minimum Listing Requirements on Alternative Market Segments: Germany (Stock exchange operator: Deutsche Börse AG)		
Amtlicher Handel (Official Market) (80 IPOs)	*Geregelter Markt (Official Parallel Market (89 IPOs)*	*Neuer Markt (New Market) (50 IPOs)*
Company should have existed for at least three years; a min. of 25% of nominal equity must be offered to the market; turnover between €50-100m with min. nominal stockholder equity of €1.25m; at least 50,000 shares must be offered with gross proceeds exceeding €25m; no stringent requirement concerning the use of funds; issuance of different share classes possible; no retention obligation for existing shareholders; operates under public law; in addition to the annual financial statements, a minimum of one interim report covering the first six months of the financial year is required; required to comply with ad-hoc publicity rules.	No set requirements for size of free float and for the company's minimum age; min. amount of shares issued: 10,000; companies going public usually have gross proceeds smaller than €25m and turnover smaller than €50-100m; the nominal stockholder equity must be at least €250,000; no stringent requirement concerning the use of funds; issuance of different share types possible; no set retention obligation for existing shareholders; operates under public law; in addition to the annual financial statements, a minimum of one interim report covering the first six months of the financial year is required; required to comply with ad-hoc publicity rules.	Company should have existed for at least one year (recently changed to three years); min. expected market capitalization: €5m; nominal stockholder equity: min. €250,000; number of shares for free float: min. 100,000; at least 25% of the shares widely held; at least 50% of the issue volume to be placed should originate from a capital increase; existing shareholders and issuer shall retain shares for the first six months following the IPO; established in 1997 to attract young, high growth companies; operates under private law; three quarterly reports per business year and one annual report are required; required to comply with ad-hoc publicity rules.
Minimum Listing Requirements on Alternative Market Segments: France (Stock exchange operator: SBF-Paris Bourse SA)		
Premier Marché (Official Market) (21)	*Second Marché (Official Parallel Market) (231)*	*Nouveau Marché (New Market) (71)*
Company must provide three years of certified consolidated statements; min. gross proceeds of €250m; at least 25% of the company must be publicly placed representing a min. of 600,000 shares; company must provide quarterly updates and half-year results and one annual report; listing applicable to large, established French and Foreign companies.	Company must provide certified consolidated accounts for the last two years prior to listing; min. size of the floatation between €10-20m; min. percentage of equity offered: 10%; company must provide quarterly updates and half-year results and one annual report; applicable to medium-sized companies (or large companies seeking an eventual listing on the Premier Marché); established in 1983.	No min. operating history; min. nominal equity: €250,000; min. no. of shares offered: 100,000 representing a float of at least €1.5m; for companies in existence of less than two years, offering must constitute a capital increase; management/personnel must keep 80% of shares for three years after the IPO; same reporting requirements as for other market segments; established in 1996.
Minimum Listing Requirements on Alternative Market Segments: Italy (Stock exchange operator: Borsa Italiana SpA)		
Borsa Valori (Official Market) (70)	*Mercato Ristretto (Official Parallel Market) (7)*	*Nuovo Mercato (New Market) (0)*
Company must provide three years of consolidated annual accounts; foreseeable market capitalization: at least €5m; may admit companies with lower market capitalization if deemed as adequate; min. public float: 25% of shares outstanding represented by shares of the same class.	Issuer must carry on, directly or through its subsidiaries, an activity capable of generating revenues; a foreseeable market capitalisation of at least €500,000; adequate distribution presumed to exist where shares representing at least 20 % of the capital represented by shares of the same class are distributed among the public.	Annual accounts published and filed for the last financial years; min. floatation: 20% of capital; min. nominal shareholder equity: €5m representing at least 100,000 shares; constant information and three quarterly financial reports; initial shareholders must keep 80% of their shares after quotation for one year; established in 1999.

Table AI *continued:*

Minimum Listing Requirements on Alternative Market Segments: Netherlands (Stock exchange operator: Amsterdam Exchanges NV)		
Officiële Markt (Official Market) (56)	*Officiële Parallel Markt (Official Parallel Market) (8)*	*Nieuwe Markt (New Market) (11)*
Business run by the issuer must have a track record of at least three years; at the time of first admission at least three out of five issuer's book years preceding such admission must have closed with a net profit; issuer capital must amount to at least €5m; a min. of 10% of the capital placed must be available for trading; lock-up period: 180 days after the IPO.	Applicable to Dutch IPOs from 1988-1993; min. nominal value of shareholder equity: NGL4m; min. gross proceeds for an IPO: NGL2.5m; since 1994 the Official Parallel Market is closed for IPOs.	New economy stocks must have a track record of at least one year (other companies: three years); after admission to listing, at least 100,000 shares must be placed; tradable market value at least €5m; all listed companies are also required to satisfy the requirements that apply to the Official Market; quarterly figures and annual certified accounts; established in 1997.
Minimum Listing Requirements on Alternative Market Segments: Spain (Stock exchange operator: Bolsa de Madrid SA)		
Primer Mercado (Official Market) (56)	*Segundo Mercado (Official Parallel Market) (32)*	*Nuevo Mercado (New Market) (0)*
Provide audited financial statements for the three years prior to IPO; min. nominal shareholder equity: €1.5m, excluding stakes of 25% or more belonging to two shareholders; at least 100 shareholders must own less than 25% of the capital; (in the last two years before IPO or in three of the last five years) must have distributed a dividend of 6% of its capital.	Official prospectus has to be filed with the Spanish supervisory authority (CNMV); min. capital reserves of €250,000; in addition, 20% of the capital should be available for trading in the market; a security issue prospectus must be presented and other administrative and legal certificates provided.	Approved 1999, operational since 2000, to create a "special trading section for innovative, high technology companies offering considerable future growth prospects, although at higher levels of risk than the traditional sectors"; part of the continuous market, but subject to more information regulations than other market segments.
Minimum Listing Requirements on Alternative Market Segments: Sweden (Stock exchange operator: OM Stockholm Exchanges AB)		
A-list (Official Market) (15)	*OTC-list (Official Parallel Market) (52)*	*O-list (New Market) (81)*
Must have at least three years of verifiable history and possess documented profit earning capacity; have at least 2,000 shareholders; possess an ownership structure under which at least 25% of the equities in the company and 10% of the votes are owned by the general public; min. market value: SEK 300m; approval must be obtained from the Swedish Financial Supervisory Authority; dual class shares common.	Must have at least three years of verifiable history and possess documented profit earning capacity; have at least 500 shareholders; possess an ownership structure under which at least 25% of the equity in the company and 10% of the votes are owned by the general public; have a market value of at least SEK50m; approval must be obtained from the Swedish Financial Supervisory Authority.	No history and profit-earning capability requirement; required: at least 300 shareholders and an ownership structure under which at least 10% of the equity in the company and 10% of the votes are owned by the general public; approval granted by the Swedish Financial Supervisory Authority; dual class shares common (low voting B shares and high voting A shares).
Minimum Listing Requirements on Alternative Market Segments: Switzerland (Stock exchange operator: SWX Swiss Exchange AG)		
SWX Hauptsegment (Official Market) (35)	*SWX Nebensegment (Official Parallel Market) (8)*	*SWX New Market (New Market) (0)*
Issuer must present audited accounts covering three complete financial years; issuer must have a min. nominal equity of CHF25m; at least 25% of shares must be floated publicly; sustained or expected capitalisation of at least CHF25m; no set rules on lock-up periods for insiders; price sensitive facts and relevant company events must be disclosed; reports must be provided annually with semi-annual updates.	Applicable to Swiss IPOs issued during 1988; min. nominal value of shareholder equity: CHF1m; min. gross proceeds: CHF2.5m; applicable to small- and medium-sized companies.	Shareholders' equity must amount to at least CHF2.5m; min. 20% of the equity capital must be in diversified hands; total market cap: min. CHF8m; company must demonstrate an operating and financial track record extending over at least 12 months before the IPO; account must be in IAS or US GAAP; lock-up period: six months following the IPO; the IPO must involve a capital increase of at least 50%.

Table AII
Comparative Results

This table addresses the impact of using a country-by-country approach (this paper) versus sector-based approach by pooling the data (Schuster (2003)) to the analysis of the performance of European IPOs. The main differences between the empirical methodologies are: 1) the use of a local trading day calendar (this paper) versus European trading day calendar (Schuster (2003)) resulting in a smaller sample size for the calculation of long-run returns (677 versus 686 companies), 2) the use of local currency unites (this paper) versus the conversion of stock prices into Euro (€), when applicable (Schuster (2003)) and 3) the choice of national benchmark indices (this paper) versus pan-European benchmark indices (Schuster (2003)) for the adjustment of raw returns. Returns were calculated as Buy-and-Hold Returns (BHRs) and Cumulative Average Returns (CARs) from the close of the first day of trading to the three-year anniversary on the stock markets with one month defined as a 21-day-trading interval. In this table, returns are reported as raw returns (RAW) (no adjustment) and returns adjusted for movements in the broad market (ADJ). The national broad-market indices (this paper) and the Dow Jones Eurostoxx broad-market index (Schuster (2003)) are used as benchmarks. The large difference in the RAW and ADJ returns using both return methodologies between Panel A and Panel B in French IPOs is due to additional four companies available for calculating three-year returns in Schuster (2003). When excluding those companies from calculation, the increase in French BHRs, amounts to 52.49 percent versus 47.80 reported.

Panel A: Pan-European Study (Schuster (2003))

			Return Methodology							
			Buy-and-Hold Returns (BHRs)				Cumulative Average Returns (CARs)			
Country	No	%	RAW	S.E.	ADJ	S.E.	RAW	S.E.	ADJ	S.E.
Germany	156	22.7	1.3654[b]	(0.7206)	0.8872	(0.7159)	0.2279[a]	(0.0447)	-0.1557[a]	(0.0572)
France	217	31.6	0.4780[a]	(0.1337)	-0.2135	(0.1326)	0.2892[b]	(0.1210)	-0.2511[c]	(0.1525)
Italy	58	8.5	0.1789	(0.1119)	-0.4470[a]	(0.1009)	0.1161	(0.0974)	-0.3758[a]	(0.0910)
Netherlands	68	9.9	-0.0303	(0.1617)	-0.4083[a]	(0.1411)	-0.1324	(0.0992)	-0.4608[a]	(0.1214)
Spain	55	8.0	0.7237[a]	(0.2549)	0.1506	(0.2396)	0.3847[a]	(0.1446)	-0.0720	(0.0921)
Sweden	101	14.7	0.8281[a]	(0.1997)	0.1515	(0.1870)	0.5293[a]	(0.0961)	0.0048	(0.0594)
Switzerland	31	4.5	0.5616[a]	(0.1997)	-0.1296	(0.1949)	0.3756[b]	(0.1566)	-0.1730	(0.1330)
All	686	100.0	0.6791[a]	(0.1746)	0.0844	(0.1729)	0.2658[a]	(0.0376)	-0.2052[a]	(0.0349)

Panel B: Comparative Country-by-Country Study (this paper))

			Return Methodology							
			Buy-and-Hold Returns (BHRs)				Cumulative Average Returns (CARs)			
Country	No	%	RAW	S.E.	ADJ	S.E.	RAW	S.E.	ADJ	S.E.
Germany	155	22.9	1.3892[c]	(0.7369)	0.9850	(0.7318)	0.2301[a]	(0.0448)	-0.1166[a]	(0.0439)
France	213	31.5	0.5369[a]	(0.1490)	-0.2074	(0.1483)	0.3717[a]	(0.1413)	-0.1901	(0.1388)
Italy	58	8.6	0.1794	(0.1171)	-0.4924[a]	(0.1050)	0.1104	(0.0940)	-0.4185[a]	(0.0918)
Netherlands	68	10.0	-0.0465	(0.2481)	-0.3089[c]	(0.1068)	-0.1433	(0.1055)	-0.3021[a]	(0.0865)
Spain	53	7.8	0.7369[a]	(0.2763)	0.0727	(0.2791)	0.3725[a]	(0.1413)	-0.1558	(0.1248)
Sweden	99	14.6	0.7290[a]	(0.1887)	-0.0725	(0.1747)	0.4786[a]	(0.0916)	-0.1270	(0.0789)
Switzerland	31	4.6	0.5595[a]	(0.2014)	-0.0943	(0.1840)	0.3510[b]	(0.1479)	-0.1817	(0.1378)
All	677	100.0	0.6888[a]	(0.1802)	0.0616	(0.1786)	0.2762[a]	(0.0387)	-0.1973[a]	(0.0340)

[a,b,c] denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a simple t-test.