

The winner's curse, legal liability, and the long-run price performance of initial public offerings in Finland*

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Rationing data for initial public offerings (IPOs) in the Finnish market make possible a test of Rock's (1986) winner's curse hypothesis. The evidence from 80 IPOs issued between 1984 and 1989 confirms the presence of the winner's curse: average returns adjusted for the bias in allocation are lower than average unadjusted returns. But the initial returns of these IPOs appear unrelated to lawsuit avoidance, as the sample firms seem unlikely to incur legal liabilities. In the long run, consistent with the evidence in the United States, the IPO firms substantially underperform the Helsinki Stock Exchange value-weighted index.

Key words: Initial public offerings; Legal liability; Long-run performance; Winner's curse

1. Introduction

Much evidence suggests that initial public offerings of common stock (IPOs) are systematically priced at a discount to their subsequent trading price [for reviews of the U.S. and international evidence, see Smith (1986) and Ibbotson and Ritter (1993)]. In attempting to explain this puzzle, many academic researchers have looked to asymmetric information among the agents involved in IPOs. One of the most convincing models is the one developed by Rock (1986), who applies the concept of the winner's curse to the new-issue market. In his model, uninformed investors most often bid successfully for overpriced new issues, since informed investors crowd them out of underpriced new issues. If new issues were not, on average, underpriced, uninformed investors would

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realize negative returns and withdraw from the new-issue market. To prevent that result, the investment banker underprices new issues so that uninformed investors earn normal returns.

In the general absence of rationing data, most of the empirical literature on new issues has not taken into account the bias in rationing. Exceptions include studies by De Ridder (1986) and Levis (1990), who find evidence of a winner's curse in the Swedish and British IPO markets. Moreover, Koh and Walter (1989) examine 66 Singaporean IPOs from the 1973–1987 period and find that the equally-weighted average initial return is 27%. Uninformed investors, however, could not have realized that return because of their disproportionately large purchases of overpriced shares: when Koh and Walter weight the individual returns by the respective allocations, the average initial return falls to 1%. This suggests that, despite the seemingly high initial returns, uninformed IPO investors essentially break even.

The environment for floating new-share capital in the U.S. requires commitment of considerable resources for legal fees, inasmuch as the issuing firms often are sued, ostensibly because of erroneous or inadequate information in their prospectuses. Ibbotson (1975) and Tinic (1988) hypothesize that the issuing firms may underprice their IPOs to reduce their vulnerability to such lawsuits. Tinic argues that several testable propositions attend the lawsuit-avoidance hypothesis: for example, IPOs issued in the U.S. after passage of the 1933 Securities Act should show larger initial returns than IPOs brought to the market before; experienced investment bankers should discount their offerings less than less knowledgeable competitors; and small and riskier firms going public should tend to discount their IPOs more than firms less likely to face legal liabilities.

Problems arise in testing these predictions, however. As documented by Ibbotson, Sindelar, and Ritter (1988), for example, average initial returns show large periodic variations, so it is difficult to isolate the effect of the Securities Act. Moreover, similar predictions arise from different theoretical models. For instance, the models of Beatty and Ritter (1986) and Carter and Manaster (1990) share some of the predictions of the lawsuit-avoidance hypothesis. Therefore, it is difficult to devise a clean test of the hypothesis, or to estimate the extent to which potential legal liabilities affect the observed initial returns.

Some recent studies provide new insights into whether the initial IPO returns imply that the issuing companies have priced their shares below their true value. These studies examine not only the returns realized immediately after the offering, but also the IPOs' long-run aftermarket performance. Simon (1989) finds that 46 IPOs floated on regional exchanges from 1926 to 1933 show substantial underperformance during their first 60 months. For 51 IPOs either traded on the New York Stock Exchange or issued during the 1933–1940 period, she finds no deviations from aftermarket efficiency. Aggarwal and Rivoli (1990) examine the one-year aftermarket performance of 1,598 IPOs issued between 1977 and 1987. Excluding the initial return, they find that stocks in their sample

underperform the market on average by 13.7%. Levis (1992) examines the three-year aftermarket performance of 712 U.K. IPOs issued between 1980 and 1988. Using three benchmark indices, he calculates performance measures for three-year cumulative average adjusted returns (excluding the initial return) and finds that they vary between -8.3% and -23.0% . Ritter (1991) examines aftermarket returns for up to three years for 1,526 IPOs issued between 1975 and 1984. In his sample the cumulative average matching-firm adjusted return from the IPO date to month 36 after the IPO (excluding the initial return) is -29.1% . He finds that the negative abnormal performance is concentrated in high-volume IPO years, when less established companies tend to go public. In light-volume years, he finds no long-run underperformance. He lists three possible reasons for his findings: fads and market overoptimism, risk mis-measurement, and bad luck.

This paper offers three main contributions.

First, it provides additional evidence that the winner's curse decreases considerably the initial returns available to an uninformed investor. In particular, some institutional features and properties of the Finnish data increase the value of the findings. The fairness of the rationing principles generalizes the results to apply to any uninformed subscribers. The allocation rules are public information, so investors can easily and accurately estimate the average allocation-weighted initial returns. Furthermore, I am able to gather an almost exhaustive sample of Finnish IPOs, which frees the results from most sources of potential bias. In contradistinction to Koh and Walter's (1989) study of Singaporean IPOs or to Levis's (1990) study of U.K. IPOs, I find the proportion of Finnish IPOs with negative initial returns is closer to the proportions documented in studies using U.S. data, such as those of Ibbotson (1975) and Tinic (1988).

Second, the Finnish IPO market provides an opportunity to examine IPO returns in circumstances where the legal liability hypothesis is unlikely to have an important impact on initial returns. Despite a generally low standard of information and reliability in the prospectuses, the sample firms seem unlikely to incur legal liabilities, because of some specific institutional features characteristic of the Finnish legal system in the sample period. Securities issuance was largely unregulated and the potential to win compensation for damages was relatively low. In practice, issuers were liable only for serious errors or omissions that would have constituted fraud.

The third main contribution of this study deals with the long-run aftermarket performance of IPOs. The Finnish IPOs substantially underperform the market in the long run. For example, from the first aftermarket price to the three-year anniversary of the IPO, the average total return is -22.4% , whereas the value-weighted index return over the same period is -1.6% . The sample is dominated by stock issued during a period of relatively high activity in the market, whereas for approximately three-fourths of the issuing firms the aftermarket period is bearish. In this respect the sample differs from those of Ritter

(1991) and Levis (1992), which are mostly from rising markets. Moreover, the aftermarket sample period (1984–1991) for the most part does not overlap with Ritter's (1975–1987), so the results of these two studies are largely independent, yet complementary. My data offer further evidence, at any rate, against the idea that mere 'bad luck' can explain the underperformance.

The paper is structured as follows. The second section details the institutional arrangements for IPOs in Finland. The third section describes my methods and data. In section 4 I look at the winner's curse as it figures in the initial returns of public offerings. The bias in rationing effectively reduces the seemingly positive and significant average initial returns to zero or less. Section 5 takes up the question of the validity of the lawsuit-avoidance hypothesis as an explanation for the initial returns in Finland. I argue that the legal liabilities associated with the process of going public are not likely to have an important impact on the pricing of Finnish IPOs. Section 6 examines the aftermarket performance of the IPOs for 36 months and shows that the IPO firms considerably underperform the value-weighted index. The paper ends with a summary of my findings.

2. The institutional arrangements for IPOs in Finland

Under Finnish law, the same financial institution can operate in both investment and commercial banking. In Finland most companies go public on the advice of large banks, which use their network of branches – hundreds of them, all over the country – to distribute the shares. The desire to minimize unnecessary clerical effort has promoted the establishment of clear guidelines – including fair allocation rules – for the treatment of oversubscribed offerings. Thus an allocation is based on the size of the order and not, for instance, on the customer's relationship with the investment bank. Lotteries are rarely used in the allocation of oversubscribed shares; instead, subscribers are allocated a fraction of the order.

The issuing companies usually publish the allocation rules in their news releases. Most of the rationing principles are also published in newspapers, but publication is sometimes dispensed with if the rules are especially lengthy or, conversely, if rationing appears unnecessary. If no news release has been issued, the rationing principles are usually detailed to subscribers in a letter in which the company announces whether the subscription has been approved and gives the exact date for payment for the shares. Companies may decide freely about the orders approved and the extent to which they are fulfilled. In practice, however, they use their discretionary power only when they have reason to believe that one person has submitted more than one order.

In oversubscribed offerings the proportional allocations depend on the size of the order. The number of shares allocated is generally a nondecreasing function of application size, but the rules are designed so that they favor small investors.

Actually, many prospectuses explicitly state that if the issue is oversubscribed, the investment banker may allocate the shares disproportionately if that is necessary to ensure a sufficiently broad owner base.

The planned closing date for the offering (as stated in the prospectus) is in most oversubscribed offerings not the actual closing date. Commonly, soon after learning that the issue has been fully subscribed, the management of the issuing firm stops approving new orders. In practice, it is impossible to time the discontinuance of the issue in such a way that the IPO will be no more and no less than fully subscribed. In other words, to avoid undersubscription, the issuers and investment bankers tend to accept orders in excess of the full subscription level. Hence, the IPOs are often both oversubscribed and discontinued before the closing date of the offering.

In Finland investors usually need not pay for new issues of common stock when they place their orders: the payment is not due until one to two months after the first day of issue. Although a subscription is legally binding, the financial press reports many cases in which the payment has not been made. Since the IPO firms are concerned about their image, they are reluctant to take legal action against investors who refuse to pay for the shares.

3. Methods and data

Initial public offerings in Finland between January 1, 1984 and July 31, 1989 are collected from *Kaupparehti*, a daily business newspaper, and *Talouselämä*, a weekly business magazine. During that period, 91 firms made initial offerings of common stock to the general public in Helsinki and announced that they intended to become listed. These offerings comprise more than 90% of all IPOs in Finland between 1960 and 1992. The sample includes 80 of the 91 offerings; 27 of them were initially listed on the Helsinki Stock Exchange (HSE, the first market), 49 in the OTC list (the second market), and 3 in the Stockbroker's list (the third market). One is still unlisted.¹ The remaining 11 are excluded because of (1) unclear or discriminatory allocation rules (five IPOs), (2) a lack of detail in the allocation rules (one IPO), (3) no aftermarket price within 512 calendar days of the first offering date (one IPO), (4) no investment banker (one IPO), (5) an IPO size of less than FIM 3 million (5 FIM \approx 1 U.S.\$, one IPO), or (6) the issue being announced only after the offering was already under way (two IPOs).² All

¹Two firms did not target a new issue to the general public but are included in the sample. *Talouselämä* targeted a new issue to its subscribers. *Insinöörilehde*, a publishing company, targeted a new issue to the members of its shareholder organizations. For both of these issues there were approximately 50,000 or more potential subscribers.

²It is rational to apply for any new issue immediately after it is offered because of the winner's curse: the very best offerings are usually oversubscribed on the first day. As a consequence, the management of the issuing company often stops accepting additional orders.

nominal variables are deflated using the consumer price index and are expressed in June 1991 FIM.

I study the initial returns from the point of view of an uninformed investor. I assume that the investor applies for all new issues and always places an order of some fixed size that is small in comparison with the investor's wealth. I study allocation patterns in 100 data points, ranging from an application size of FIM 5,000 to FIM 500,000. The number of shares allocated is calculated at each data point in accordance with the rationing rules. If a proportional-type rationing rule is applied in an IPO, I ignore any additional rounding rules.

The average time between the offering date and the first trading date – approximately three months – is longer than in most IPO markets. Unlike Koh and Walter (1989), who take into account only the (risk-free) opportunity cost of the part of the capital tied up in the subscription but not given any allocation, I adjust initial returns for market movements to compensate both for the tied-up capital and the risk in this intermediate period. Since for most new issues the last payment date for the shares is after the first day of issue, I add a risk-free interest rate for the intermediate period to the return. I also take into account transaction costs for acquiring shares from an IPO and selling them in the aftermarket. Transaction costs include brokerage commissions and a transaction tax, which normally total 1.8% of the trade (but transaction costs vary across securities because the transaction tax is different in different marketplaces).

The initial excess returns are calculated as follows:

$$ar_i = \frac{P_{it}(1 - TR_i) - P_{io}}{P_{io}} - \frac{I_{it} - I_{io}}{I_{io}} + \frac{r_{fio}(p_i - o_i)}{365},$$

where ar_i is the initial excess return (henceforth, initial return) for IPO i , TR_i is transaction cost, P_{it} is the average of the highest and lowest first-trading-day trade price, P_{io} is the subscription price, I_{it} is the value of the HSE value-weighted index on the first trade date, I_{io} is the value of the HSE value-weighted index on the first day of issue, r_{fio} is the one-month risk-free return on the first day of issue, and $p_i - o_i$ is the number of calendar days between the first day of issue and the last payment date for the shares.

The average initial return, conditional on a given subscription, is calculated by using the data from the offerings for which the subscription strategy is feasible. Not all subscription strategies are feasible for all IPOs, since the issuing companies may limit the minimum or maximum order. For example, five firms announced that applications had to exceed FIM 5,000. Consequently, these observations do not enter the average return calculation that is conditional on an application size of FIM 5,000. In some IPOs the very biggest subscriptions are rationed on a case-by-case basis. In only a few cases, however, does this affect subscriptions under FIM 500,000. I obtain the average initial

allocation-weighted returns for a given subscription strategy by weighting the individual returns by the proportional allocations of the shares:

$$\overline{ar}_{as} = \frac{\sum_{i=1}^n ar_i a_{is}}{\sum_{i=1}^n a_{is}}$$

for $s \in \{\text{FIM 5,000, FIM 10,000, } \dots, \text{FIM 500,000}\}$,

where \overline{ar}_{as} is the average allocation-weighted excess return for subscription strategy s , ar_i is the initial excess return for IPO i , n is the number of observations, and a_{is} is the proportional allocation for IPO i with subscription strategy s . a_{is} takes the value zero if subscription strategy s is infeasible for IPO i .

In analyzing the long-run aftermarket performance, I denote the first offering date by day 0 and the initial return period by month 0. The aftermarket period includes 36 months, defined as successive 21-trading-day periods after the first offering date. Hence, the first month of IPO aftermarket performance includes trading days 1–21, the second, trading days 22–42, and so on. Because of an institutional lag in the listing process, the initial return period overlaps the aftermarket period; therefore, a typical observation lacks several months of potential aftermarket data at the beginning of the aftermarket period. The analysis employs only full trading months. Hence, for example, if an IPO is listed on trading day 37, the remaining days for the second trading month (trading days 38–42) are omitted and the first actual aftermarket trading month (designated as month 3 in the analysis) starts with trading day 43. The aftermarket period is truncated from the end for the IPOs that are delisted before month 36 (12 observations) or that have not accumulated enough data (IPOs issued in 1989, 8 observations). One observation (*Asuntorahoitus*) lacks all aftermarket data apart from the first trade price.

It is difficult to determine the risk of individual securities when no prior market price information exists. Unless specified otherwise, I report returns that are not adjusted for risk other than that prevailing in the market as a whole. To examine the robustness of the aftermarket performance, however, I calculate the cross-sectional betas with the RATS (returns across time and securities) procedure of Ibbotson (1975). The RATS model specification, adapted from Clarkson and Thompson (1990), is as follows:

$$r_{it} = \alpha_j + \beta_j r_{mt} + \varepsilon_{it},$$

where r_{it} is the raw return for security i for period t , r_{mt} is the HSE value-weighted index return, and j denotes the number of months from the initial offering.

The abnormal return ar_{it} for stock i for the aftermarket month t is defined differently from the initial return:

$$ar_{it} = r_{it} - r_{mt}.$$

That is, it is a market-adjusted return. Unlike in the initial return computations, no transaction costs are taken into account. The average market-adjusted return for month t is

$$AR_t = \frac{1}{n_t} \sum_{i=1}^{n_t} ar_{it},$$

where n_t is the number of observations listed for the entire month t . The cumulative average market-adjusted return from month u to month v is

$$CAR_{u,v} = \sum_{t=u}^v AR_t.$$

The use of cumulative average market-adjusted returns implicitly assumes monthly portfolio rebalancing. Since such a portfolio strategy is difficult to implement, I also analyze holding-period returns. The 36-month holding-period return, exclusive of the initial return, is defined as follows:

$$\prod_{t=1}^{36} (1 + r_{it}) - 1,$$

where r_{it} is the raw return for firm i in event month t . This measure is not precise for the 20 firms that are delisted early or for which the return interval is truncated.

When the initial return period is included in the holding period, the above product is multiplied by the term

$$1 + \left[\frac{P_{it} - P_{io}}{P_{io}} + \frac{r_{fio}(p_i - o_i)}{365} \right],$$

where P_{it} is the average of the highest and lowest first-trading-day trade price, P_{io} is the subscription price, r_{fio} is the one-month risk-free return on the first day of issue, and $p_i - o_i$ is the number of calendar days between the first day of issue and the last payment date for the shares.

I use holding-period returns for the IPOs and the corresponding HSE value-weighted index returns to calculate the performance of the IPO firms in relation to the market. The *wealth relative* for IPO i from months u to v is

defined as follows:

$$\prod_{t=u}^v (1 + r_{it}) / \prod_{t=u}^v (1 + r_{mt}).$$

Hence, a wealth relative greater than one indicates that the IPO firm has outperformed the market, and vice versa.

I collect rationing data from sources that can be ranked in accuracy and reliability. The most accurate data sources, found in the files of the research departments of Kansallis Bank and Unitas (the two largest brokers), are the issuing companies' news releases and the letters sent to investors. Next, I consult the issues of *Kauppalehti* and *Talouselämä* and the news releases from the Finnish News Agency. Finally, and least reliably, I ask the issuing firms and/or the investment bankers about the details of rationing. The search results in 80 IPOs for which rationing data are available. The sample is almost exhaustive, as only one firm lacks rationing data.³

Offering prices are collected from prospectuses. In Finland the recorded stock prices are usually actual trading prices between two investors, rather than bid and ask prices between an investor and a dealer. Therefore, a natural choice for the initial aftermarket price is the first trade price. Because the closing prices are not recorded for most of the sample period, I use the mean of the highest and lowest trade price. For two new issues 'gray market' data, quotations for the as-yet unlisted shares in unofficial marketplaces, are the only meaningful data available. In these cases I use the median of the first-day trading prices in the different gray markets. The primary source of the aftermarket return data for HSE companies for the years 1984–1989 is the database compiled by the Swedish School of Economics. For the years 1990–1991 and for the OTC companies, *Kauppalehti* is the primary source. The aftermarket returns are calculated with the average of the highest and lowest trade price; when no trade has taken place, the bid price is used instead (when there is no trade or bid price, the previous trade or bid price is used unless it is higher than the ask price). The dividend and share issues data are collected from the issue of Kansallis Bank's *Listed Companies* and *OTC Companies*, *Pörssitieto*, and *Kauppalehti*, and the returns are adjusted accordingly.

Most of the sample IPOs trade on the OTC list, so a natural benchmark for measuring aftermarket performance would be the OTC index. Since the OTC list was established only during the sample period, however, the stocks represented in the index are almost the same as the sample firms, so using the OTC

³ The missing company, Sponsor, is a development company that went public in 1984. The offering had an initial return of 86.0%, and the number of shares applied for was approximately four times the number offered. Sponsor is the only Finnish IPO that has used a lottery mechanism to allocate the shares.

index as a benchmark would tend to bias the results in favor of finding no abnormal returns. Alternatively, the returns of some matching firms could be used as a benchmark, as in Ritter (1991). Unfortunately, there are fewer matching firms (prior to 1984, 48 companies listed on the HSE and no OTC companies) than there are IPOs in the sample (80), so the matching procedure is not feasible.

The value-weighted WI index, which is calculated for the companies listed on the HSE, is used as a proxy for the market return for the years 1984–1990. For 1991, however, I use the HEX index, which has similar properties. Dimson and Marsh (1986) and Ritter (1991), for example, show that abnormal returns measured over long intervals can be sensitive to the choice of the benchmark index. Therefore, I also apply an equally-weighted index of the HSE firm returns for the years 1984–1990. The index is constructed in two stages. First, I calculate an equally-weighted portfolio of all classes of stock traded for each individual firm on the HSE (a firm can have different classes of stock because of foreign ownership restrictions and because of differences in voting power). Second, I exclude the firms in the IPO sample, and calculate an equally-weighted average of the return series of the remaining firms. Hence all non-IPO HSE firms are assigned the same weight in the index, irrespective of the number of share classes traded.

The quarterly average interest rates for market-based borrowing by commercial banks, computed by the Bank of Finland, serve as a proxy for the riskless interest rate in 1984–1986.⁴ For 1987–1989, daily values of the one-month Helibor (Helsinki interbank offered rate) similarly serve as a proxy for the risk-free rate. The data to calculate interest days are collected from prospectuses and from the approval letters sent to subscribers.

4. Initial returns and the winner's curse

4.1. Descriptive statistics

Table 1 shows some descriptive statistics for the sample. The average initial return is significantly positive, and except in one year, the yearly averages are positive. The initial returns are skewed to the right and have excess kurtosis; Jarque and Bera's (1980) normality test indicates that the null hypothesis about the normality of the initial return distribution can be rejected at the 1% significance level. Moreover, the initial returns are not independent, because the initial return periods overlap, especially during the 'hot-issue' year of 1988. Since the *t*-statistics assume that the initial returns are both independent and normally distributed, the *t*-values have to be interpreted with caution.

⁴In 1984–1986 the money market was still relatively undeveloped in Finland. Therefore, there is no obvious choice for the reference interest rate.

Table 1

Descriptive statistics for a sample of 80 Finnish initial public offerings for the period January 1, 1984 to July 31, 1989 (5 FIM \approx 1 U.S.\$).

<i>Panel A: Descriptive statistics from the whole sample</i>		
Mean gross proceeds (1,000 FIM) ^a		67,362
Median gross proceeds (1,000 FIM) ^a		31,645
Mean time (calendar days) from first day of issue to listing		98 days
Median time (calendar days) from first day of issue to listing		82 days
Equally-weighted mean initial excess return ^b		0.087
Standard deviation ^b		0.295
<i>t</i> -statistic ^b		2.62
Number of observations with positive initial excess return ^b		47
Number of observations with negative initial excess return ^b		33
Skewness ^b		1.94
Kurtosis ^b		5.98
Gross proceeds-weighted mean initial excess return ^{a,b}		0.041
<i>t</i> -statistic ^b		1.77

<i>Panel B: Equally-weighted mean initial excess returns by IPO year</i>		
IPO year	Number of IPOs	Mean initial excess return ^b
1984	7	0.196
1985	2	0.075
1986	5	-0.024
1987	14	0.190
1988	43	0.060
1989	9	0.032
	Total 80	Average 0.087

^aGross proceeds are calculated from the minimum number of shares offered to the public and are measured in terms of the purchasing power of the June 1991 FIM.

^bThe statistics are calculated assuming that no rationing occurs and that all subscription strategies are feasible. The initial excess returns are calculated as follows:

$$ar_i = \frac{P_{it}(1 - TR_i) - P_{io}}{P_{io}} - \frac{I_{it} - I_{io}}{I_{io}} + \frac{r_{fio}(p_i - o_i)}{365},$$

where ar_i is the initial excess return for IPO i , TR_i is the transaction cost, P_{it} is the average of the highest and lowest first-trading-day trade price, P_{io} is the subscription price, I_{it} is the value of the HSE value-weighted index on the first trade date, I_{io} is the value of the HSE value-weighted index on the first day of issue, r_{fio} is the one-month Helibor return on the first day of issue, and $p_i - o_i$ is the number of days between the first day of issue and the last payment date for the shares.

The IPO size-weighted average return is somewhat lower than the equally-weighted average return, since large IPOs (typically HSE companies) tend to realize smaller initial returns than small IPOs (typically OTC companies). The results are consistent with the evidence from the U.S. documented by Ritter (1987) and others. The largest and the third-largest sample IPOs were denationalizations, and the realized initial excess returns in these offerings were meager, -15.7% and 7.4%. By contrast, Jenkinson and Mayer (1988) report large

initial returns for the IPOs of denationalized firms in the U.K. and France. In their sample only 5 of 23 of the positive initial returns are in single figures and 13 exceed 20%.

I find a much longer average initial return period than do studies using U.S. data. The planned selling period usually lasts two or three weeks, after which the subscribers have, on average, three weeks to pay for the shares. Most IPO firms apply for listing immediately after the last payment date for the shares, but it usually takes several weeks to process an application, and occasionally the firm is asked to submit further information before the application is considered.

4.2. *The winner's curse*

Fig. 1 displays proportional allocations conditional on application sizes ranging from FIM 5,000 to FIM 500,000. The curves represent the whole sample and new issues with positive and negative initial returns as identified after the offering. The winner's curse is clearly present; on average, uninformed investors obtain large allocations from the IPOs with negative initial returns and small allocations from those with positive returns. Moreover, small investors tend to receive a greater than proportional share of offerings with positive initial returns.

Fig. 2 illustrates the average unconditional initial returns and average allocation-weighted returns as a function of application size. The average unconditional

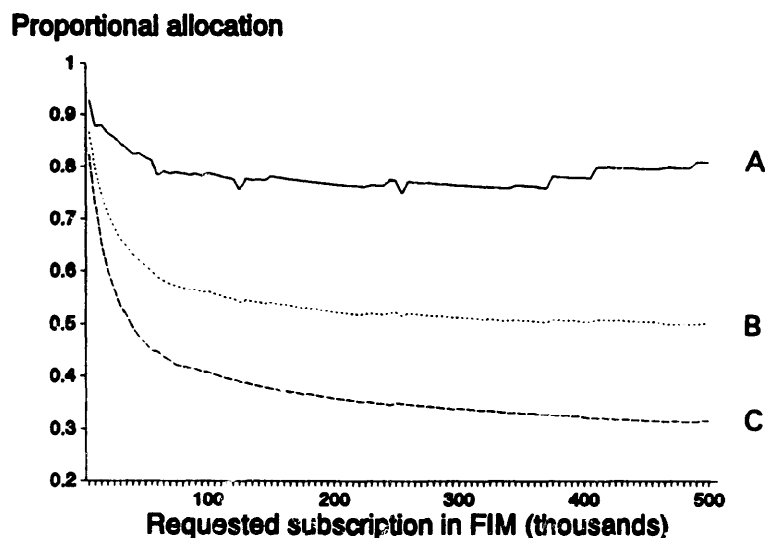


Fig. 1. Average proportional allocations as a function of the value of shares requested. The sample includes 80 Finnish initial public offerings issued in the period January 1, 1984 to July 31, 1989. The curves represent IPOs with negative initial excess returns (curve A, 33 observations) and positive initial excess returns (curve C, 47 observations) as well as the whole sample (curve B). The value of the shares requested is measured in terms of the purchasing power of the June 1991 FIM (5 FIM \approx 1 U.S.).

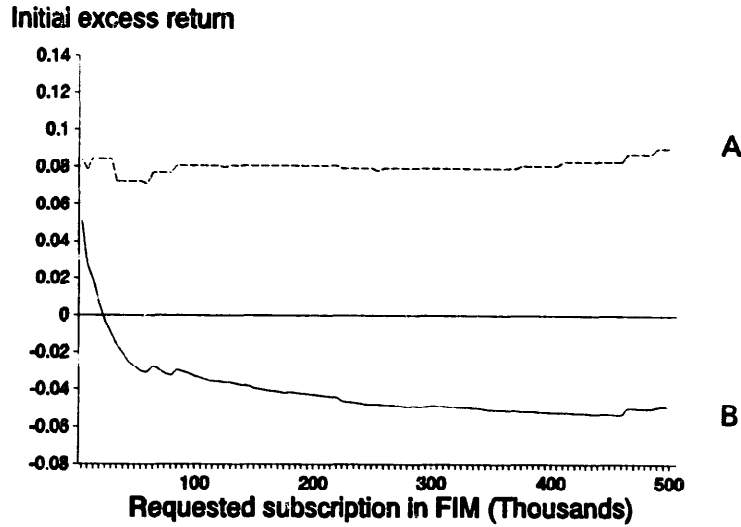


Fig. 2. Average unconditional initial excess returns (curve A) and average allocation-weighted initial excess returns (curve B) for a sample of 80 Finnish initial public offerings issued in the period January 1, 1984 to July 31, 1989. Some firms refuse to consider very small or very large purchase orders; the erratic shape of the unconditional average excess return curve reflects the differences in allowable application size. If an application size is not feasible for an IPO, the IPO does not enter the average return calculation that is conditional on the given application size. The allocation-weighted return for each application size is calculated by weighting individual excess returns by the proportional allocations for the respective application size. The value of the shares requested is measured in terms of the purchasing power of the June 1991 FIM (5 FIM \approx 1 U.S.\$).

returns are in the range of 7.1% to 9.1%, and the t -values vary from 2.26 to 2.72. The erratic shape of the curve is due to discontinuities in the allowable application size, imposed for convenience in application processing and in an attempt to attract a desirable investor clientele. The average allocation-weighted returns are in general negative and clearly lower than average returns that have not been adjusted for the bias in rationing: for example, for a subscription of FIM 100,000, the difference between the unconditional return and the allocation-weighted return is approximately 11 percentage points. This implies that the winner's curse substantially decreases the average returns available to an uninformed investor. The curse would seem to be less severe in Finland than in Singapore, however, where Koh and Walter (1989) report that the difference between the unconditional return and the allocation-weighted return is approximately 26 percentage points.

Fig. 2 indicates that the average allocation-weighted return is generally a decreasing and convex function of the size of the order. This is very clear with small application sizes: the average return drops sharply as a function of the size of the order. For example, a subscription of FIM 5,000 yields an average return of 5.1%, whereas the return is already negative for a subscription of FIM 25,000. Small subscribers clearly benefit from the average return pattern, which creates an incentive to submit multiple applications. In Finland investors can submit only one application on their own behalf. Some investors have tried to

Table 2

Average allocations and allocation-weighted excess returns for a sample of 80 Finnish initial public offerings for the period January 1, 1984 to July 31, 1989. The number of potential IPOs varies across order sizes because some offerers refuse to consider very small or very large applications. The average realized initial excess return for each application size is calculated by weighting the individual excess returns by the proportional allocations for the respective application size. The average excess return per issue (expressed in FIM) is calculated by multiplying the average FIM allocation per issue and the average realized initial excess return. The *t*-values and the skewness coefficients for each application size are calculated using the FIM excess returns for the respective application size. All nominal variables are measured in terms of the purchasing power of the June 1991 FIM (5 FIM \approx 1 U.S.\$).

FIM order size	Number of potential IPOs	Average FIM allocation per issue	Average realized initial excess return	Average FIM excess return per issue	<i>t</i> -statistic	Skewness
5,000	75	4,342	0.051	222	1.75	1.60
10,000	77	7,928	0.027	215	1.05	0.42
15,000	77	11,223	0.018	204	0.72	0.07
20,000	78	14,165	0.006	81	0.24	-0.31
25,000	78	17,149	-0.003	-48	-0.12	-0.72
30,000	78	19,863	-0.010	-189	-0.42	-0.99
35,000	77	22,730	-0.016	-364	-0.71	-1.16
40,000	77	25,292	-0.021	-521	-0.91	-1.31
45,000	77	27,955	-0.025	-711	-1.13	-1.40
50,000	77	30,512	-0.028	-846	-1.26	-1.32
100,000	77	56,070	-0.033	-1,858	-1.50	-1.56
200,000	77	104,507	-0.043	-4,498	-1.87	-1.63
300,000	76	153,718	-0.049	-7,503	-2.07	-1.62
400,000	75	201,539	-0.053	-10,577	-2.17	-1.61
500,000	72	249,888	-0.049	-12,283	-1.97	-1.68

circumvent this rule by collecting proxies from other persons. As a consequence, some firms have restricted or forbidden subscription by proxy. Moreover, some firms, typically with large initial returns, have applied the restriction only after the quality of the issue has been revealed.

Table 2 shows that for small application sizes the average allocation-weighted returns do not differ significantly from zero, whereas large orders yield significantly negative returns.⁵ Skewness coefficients of the allocation-weighted returns vary with the size of the order. With small subscriptions they are positive

⁵The results do not change substantially if 12 offerings with special characteristics are excluded from the sample. These include eight investment companies, two companies that arranged an issue by auction between the offering and listing, one company issuing warrants with the shares, and one company with a rights offering with beneficial conditions for a nonlisted class of shares. Without rationing the *t*-values range from 2.08 to 2.55, whereas *t*-values of allocation-weighted returns range from 1.57 to -2.34.

and with larger subscriptions, negative: an order of FIM 5,000 produces a skewness coefficient of 1.60, whereas for an order of FIM 500,000 it is -1.68 .

Another way to illustrate the winner's curse is to divide the sample into rationed IPOs (50 observations) and nonrationed IPOs (30 observations). The unconditional average initial returns for the two groups are 18.2% and -6.4% . Both returns are significantly different from zero, as the t -values are 3.87 and -2.69 .

5. The lawsuit-avoidance hypothesis of IPO underpricing

Ibbotson (1975) and Tinic (1988) have suggested that the issuing firm may underprice to reduce the legal liability arising from any false or inadequate information in the prospectus. This lawsuit-avoidance motive probably affected IPO pricing in Finland during the sample period relatively little, for several reasons. First, in the sample period the stock market was constrained only by general laws and self-regulation. No authorities or securities laws regulated the information content of the prospectuses or potential resulting liabilities, so defendants would have been legally liable only for very serious errors or omissions of information that constituted fraud. If a case had been taken to court, the burden of proof would have rested with the plaintiffs, not the defendants. Second, the only persons liable for any misrepresentation of information are the members of the board of the company (in addition, the auditors are liable for the auditor's report). The investment bankers have no personal legal liability in the IPO, reducing their incentive to underprice the offering. Third, Finnish law stipulates that the defendant is not legally liable for damages exceeding the loss, so no personal compensation is possible. In damage suits in general, the compensation awarded is modest compared with that in the U.S. Fourth, class actions are not possible, since each claimholder is required to sue the issuing firm separately. Since the interest of almost all individual subscribers is relatively small, only a few subscribers could benefit from a suit.

Given the lack of incentives to provide full and accurate information, it is not surprising that many sample prospectuses fail to meet the degree of diligence required of prospectuses in countries that regulate share issues. Generally, the risks, uncertainties, or speculative qualities of the issues are not listed in the prospectus. The Helsinki Stock Exchange and the Association of Stock Brokers (the organization keeping the OTC list and the Stockbrokers' list) provide only value guidelines for presenting accounting data or other information, so some newly established companies omit information on some of the firm's most important financial characteristics, such as its liabilities. Low-quality prospectuses are not confined to small investment bankers. An extreme example of misleading information occurred in the IPO of a real estate investment company underwritten by a major investment bank. The cover of the prospectus showed

a well-known building that carried the same name as the issuing company, but that the company did not own.

To estimate the legal liabilities associated with IPOs, data on the frequency of lawsuits are needed. Unfortunately, these data are difficult to obtain, so I rely on the view of two experts in the field, Professors Juhani Kyläkallio and Jarmo Leppiniemi from the Helsinki School of Economics and Business Administration. They are not aware of any case in which a suit has been filed against an issuing company as the result of an IPO.

Given the paucity of legal liabilities associated with the process of going public in Finland, it is unlikely that potential legal liability has much to do with the observed initial returns. Of course, this does not mean it is unimportant in other IPO markets, such as the U.S. All else being equal, the fact that the average initial return is lower in Finland (8.7%) than in the U.S. [16.4% in a sample of 8,668 IPOs from 1960 to 1987 in Ibbotson, Sindelar, and Ritter (1988)] is consistent with the argument that legal liability figures more importantly in the U.S. A recent study by Drake and Vetsuypens (1992), however, calls such a conclusion into question. They examine a sample of 93 U.S. firms from 1969 to 1990 that are sued after their IPOs. They find that the average initial return for the sample firms is approximately the same as that for a control group of IPOs of similar size. Moreover, they present evidence that litigation typically results from some unfavorable company-specific news in the aftermarket and not from IPO overpricing on the first trading day.

6. Long-run aftermarket performance

Table 3 shows the aftermarket performance of the IPOs for the 36 months following the IPO, excluding the initial return. The beta is assumed to be one for all observations. Since there are relatively few observations in the first two aftermarket months, the first average market-adjusted return reported is calculated for event months 1–3; consequently, some observations have more than one month of aftermarket performance in the first average market-adjusted return. The average HSE value-weighted index-adjusted return is negative for 22 out of 34 months. The cumulative average value-weighted index-adjusted return from the IPO date to month 36 ($CAR_{1,36}$) is -26.4% with a t -value of -2.74 .

Ibbotson (1975) and Clarkson and Thompson (1990) present evidence that IPO firms generally have cross-sectional betas greater than one. For approximately three-fourths of the sample firms, the aftermarket period coincides with a bear market; therefore, the negative market-adjusted returns could potentially result from an underestimate of the beta. I examine this possibility by estimating the cross-sectional betas with Ibbotson's (1975) RATS procedure. Although not shown here, the estimated betas for the separate months between event months 3 and 12 are all below one, and all the betas except one are below 0.8 (because of

Table 3

Market-adjusted returns and cumulative market-adjusted returns for a sample of 79 Finnish initial public offerings for the period January 1, 1984 to July 31, 1989, excluding the initial return. The number of firms trading is initially low because there is an average delay of three months from the date of the IPO to listing. $AR_t = 1/n_t \cdot \sum(r_{it} - r_{mt})$, where r_{it} is the return for IPO i in event month t , r_{mt} is the HSE value-weighted index return, and n_t is the number of observations in event month t . AR_3 employs the observations of event months 1–3. The t -statistic for the cumulative average value-weighted index-adjusted return in month t , $CAR_{1,t}$, is computed as $CAR_{1,t} \cdot \sqrt{(n_t/t)/std}$, where std is the average (over 36 months) cross-sectional standard deviation. Std has a value of 0.123, and the first-order autocorrelation coefficient of the AR_t series is -0.093 .

Months in relation to date of IPO	Number of firms trading	AR_t	t -statistic	$CAR_{1,t}$	t -statistic
1	1				
2	4				
3	21	0.022	0.47	0.022	0.46
4	46	-0.028	-2.00	-0.006	-0.17
5	61	-0.017	-1.35	-0.023	-0.66
6	70	-0.009	-0.96	-0.032	-0.88
7	72	-0.027	-2.83	-0.058	-1.52
8	74	-0.002	-0.17	-0.060	-1.48
9	76	-0.024	-1.97	-0.085	-1.99
10	77	0.011	1.16	-0.073	-1.64
11	77	-0.005	-0.48	-0.078	-1.67
12	77	-0.021	-2.25	-0.098	-2.02
13	78	0.008	0.93	-0.090	-1.79
14	77	-0.019	-2.07	-0.110	-2.08
15	76	-0.015	-1.42	-0.125	-2.28
16	75	-0.004	-0.38	-0.129	-2.27
17	75	0.005	0.32	-0.124	-2.11
18	76	0.005	0.26	-0.119	-1.99
19	76	-0.009	-0.61	-0.128	-2.08
20	76	-0.017	-1.30	-0.145	-2.29
21	76	-0.028	-2.17	-0.174	-2.68
22	76	-0.003	-0.17	-0.176	-2.65
23	74	0.002	0.10	-0.174	-2.54
24	74	-0.055	-3.31	-0.229	-3.26
25	74	-0.001	-0.04	-0.230	-3.20
26	73	-0.005	-0.33	-0.235	-3.19
27	71	0.007	0.47	-0.227	-2.99
28	70	0.006	0.20	-0.221	-2.83
29	70	-0.030	-1.78	-0.251	-3.16
30	70	0.001	0.07	-0.250	-3.09
31	68	0.010	0.72	-0.240	-2.88
32	64	0.032	2.05	-0.208	-2.38
33	61	-0.008	-0.52	-0.216	-2.38
34	60	0.002	0.13	-0.214	-2.30
35	59	-0.025	-1.44	-0.239	-2.51
36	59	-0.026	-1.60	-0.264	-2.74

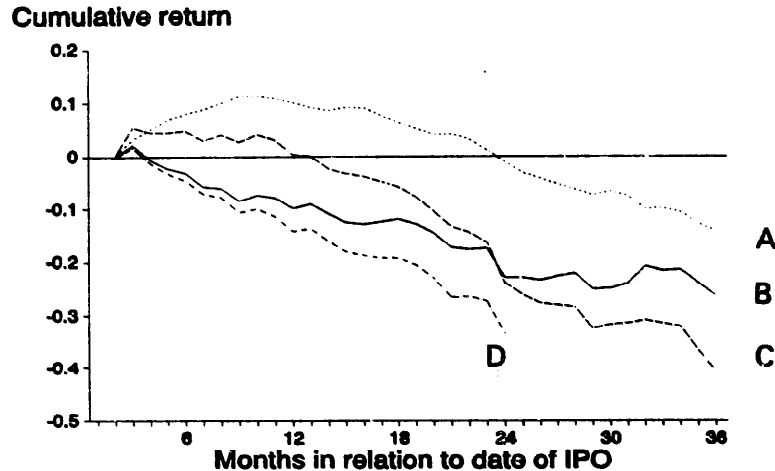


Fig. 3. Cumulative returns for the HSE value-weighted index (curve A), cumulative HSE value-weighted index-adjusted returns (curve B), cumulative raw returns (curve C), and cumulative HSE equally-weighted index-adjusted returns (curve D) for an equally-weighted sample of 79 Finnish IPOs issued during the period January 1, 1984 to July 31, 1989. The initial return is excluded from the cumulative returns, and the portfolio of IPOs is rebalanced monthly. The curves start from month 3 after the first IPO date because relatively few firms have aftermarket data for the two first months after the IPO.

the small number of observations, the regressions for the two first months are not considered). When longer holding-period returns are used, however, the betas increase considerably. The estimated betas over months 3–12, 13–24, and 25–36 are 1.02, 0.48, and 1.05. The long-run performance is relatively insensitive to moderate changes in beta: for example, $CAR_{1,36}$ is -23.6% if the betas are assumed to be 1.2. Given the magnitude of the estimated cross-sectional betas, it is unlikely that risk mismeasurement alone could account for the results.

Fig. 3 plots cumulative raw returns, cumulative returns for the HSE value-weighted index, and cumulative HSE value-weighted index-adjusted returns for the 36 months after the IPO date, excluding the initial return. In addition, the cumulative HSE equally-weighted index-adjusted returns are shown for the 24 months after the IPO.⁶ There is a clear downward pattern in the cumulative raw and market-adjusted returns. The equally-weighted index-adjusted returns show even more negative abnormal performance than the value-weighted index-adjusted returns. Some part of the difference in the aftermarket performance is probably due to the exclusion from the equally-weighted index of poorly

⁶Unfortunately the HSE equally-weighted index for 1991 was not available when this paper was being written. Since 43 of the 80 sample firms had their IPO in 1988, and another 9 firms in 1989, the average equally-weighted index-adjusted returns for the period of 25 to 36 months after the IPO would be based on a disproportionately small number of observations. Therefore, I report the cumulative equally-weighted index-adjusted returns for the first 24 months after the IPO only.

performing firms in the IPO sample. The cumulative returns for the value-weighted index increase in the ten first event months, whereas event months 11–36 are characterized by negative market returns. This reflects the fact that 43 of the 80 IPOs were issued during the hot-issue year of 1988; moreover, the value-weighted index reached its peak in April 1989, declining thereafter by – 58.1% until December 1991.

Aggarwal and Rivoli (1990) find that the trading volume of IPO shares falls relatively quickly after the listing date. In Finland, in particular, a large decline in aggregate trading volume coincides with the aftermarket period common to most sample observations. For example, in 1989 the restricted shares trading volume on the HSE was FIM 25.9 billion, whereas it was FIM 11.7 billion in 1990 and FIM 3.9 billion in 1991.⁷ Because of the decrease in trading volume, the results are likely to exaggerate the negative abnormal performance. Recall that the returns are calculated using the average trade price; the bid price is used only if no trade has taken place. In the first trading month, the bid price is used in 14 of 79 observations and in month 36 in 29 of 59 observations. Moreover, the bid–ask spreads tend to be larger for firms that have been listed for several months than for firms that are just starting to trade: the average bid–ask range for the observations with no trade is 6.8% in the listing month and 17.9% in event month 36 (the average bid–ask range is defined as $2 \cdot (\text{ask} - \text{bid}) / (\text{bid} + \text{ask})$). The trade price is, on average, close to the average of the bid and ask price, as the relative is 0.998 in the listing month and 0.987 in month 36. Using the above information, a rough estimate of the bias for the cumulative market-adjusted return for event month 36 is $(14/79) \cdot (0.068/2) - (29/59) \cdot (0.179/2) \approx -3.8\%$.

Table 4 presents the distribution of 36-month holding-period total returns for the IPO firms and for the HSE value-weighted index. The total return for the market index is calculated over the same interval as that of the corresponding IPO. The table indicates that the IPOs generally realize smaller returns than the market index. From the offering price to three years later, the average return is – 9.7%, whereas the market index return over the same period is 1.0%. Although these returns reflect the long-run performance of IPOs from the viewpoint of the issuing firms, they could not have been realized by an uninformed investor. To see why, consider a more realistic investment strategy in which the uninformed investor places an order of some fixed size for each IPO and holds the shares allocated for three years. Such a strategy would yield less than the equally-weighted average of the holding period returns, because the uninformed investor would be allocated fewer shares with positive initial returns and more shares with negative initial returns. Therefore, I weight the three-year IPO and market index returns by the proportional allocations of IPOs. Recall that these weighted averages are functions of the size of the order. The

⁷Restricted shares are stocks that foreigners are not allowed to hold. All sample firms issued restricted shares in their IPOs.

Table 4

The distribution of 36-month holding-period total returns for a sample of 79 Finnish initial public offerings issued in the period January 1, 1984 to July 31, 1989, and for the HSE value-weighted index. The holding-period returns are calculated as $\prod_{t=0}^{36} (1 + r_{it}) - 1$, where r_{it} is the monthly return for stock i or for the value-weighted index for time t , and $t = 0$ denotes the initial return period. Excluding the initial return period, the holding period is on average 30 months because the IPO firms are typically not listed until three months after the IPO and because some firms are delisted within 36 months of the IPO or lack sufficient aftermarket data. The corresponding HSE value-weighted index return is calculated for the same truncated interval. The mean wealth relative is defined as follows:

$$\text{Mean wealth relative} = \frac{1 - \text{Average 36-month total return on IPOs}}{1 + \text{Average 36-month HSE value-weighted index return}}$$

The median wealth relative employs the median observations instead of the mean.

Rank	36-month holding-period return			
	Including initial return		Excluding initial return	
	IPOs	Value-weighted index	IPOs	Value-weighted index
1 (lowest)	-0.989	-0.582	-0.989	-0.573
10	-0.787	-0.505	-0.808	-0.519
20	-0.671	-0.442	-0.675	-0.479
30	-0.544	-0.326	-0.578	-0.393
40 (median)	-0.383	-0.267	-0.462	-0.318
50	-0.217	-0.213	-0.278	-0.199
60	0.024	0.082	-0.091	0.016
70	0.685	1.243	0.332	1.354
79 (highest)	4.140	2.038	4.292	2.172
Mean	-0.097	0.010	-0.224	-0.016
Mean wealth relative		0.894		0.789
Median wealth relative		0.843		0.789

difference between the three-year weighted average IPO return and the market index return varies between -10.1% and -19.4%.

The long-run underperformance is more severe when the initial return is excluded from the holding-period return. Table 4 indicates that from the first aftermarket price to the three-year anniversary of the IPO, the average total return is -22.4%, whereas the market return is -1.6%. In other words, a strategy of investing in IPOs on the first trading day and holding them for 36 months from the IPO would have left the investor with only 79 cents for each dollar invested in the HSE value-weighted index.

Table 5 examines the mean and median wealth relatives and the relative frequency of IPOs with negative abnormal performance for different holding periods. As noted previously, a wealth relative larger than one implies that an IPO has outperformed the market, whereas a wealth relative less than one

Table 5

Descriptive statistics for the long-run aftermarket performance of 79 Finnish initial public offerings issued in the period January 1, 1984 to July 31, 1989 and categorized according to IPO year, size, and business sector. The wealth relative for firm i between event months u and v is defined as

$$\text{Wealth relative} = \prod_{t=u}^v (1 + r_{it}) / \prod_{t=u}^v (1 + r_{mt}),$$

where r_{it} is the monthly return for stock i for time t , and r_{mt} is the corresponding HSE value-weighted index return. The wealth relatives are calculated for all observations that have at least one month of aftermarket performance in the indicated holding period. The mean and median wealth relatives employ the mean and the median of the IPO firm and HSE value-weighted index holding-period returns. The numbers in parentheses indicate the number of observations in each subsample.

Panel A: Distribution of wealth relatives for different holding periods

Holding period (months)	1-12	13-24	25-36	1-24	1-36
Wealth relative ≥ 1	16	28	33	20	21
Wealth relative < 1	61	51	41	59	58
All firms	77	79	74	79	79

Panel B: Mean wealth relatives for different holding periods

Holding period (months)	1-12	13-24	25-36	1-24	1-36
All firms (79)	0.938	0.878	0.963	0.831	0.789
IPO year 1984-1985 (9)	0.852	0.666	1.130	0.577	0.672
IPO year 1986-1987 (19)	1.119	0.850	0.913	0.996	0.909
IPO year 1988-1989 (51)	0.862	0.978	0.925	0.832	0.792
Investment companies (20)	0.870	0.971	1.141	0.914	0.994
Financial industry (9)	1.025	0.667	1.033	0.633	0.614
Trade and other services (14)	0.962	0.896	0.815	0.839	0.726
Manufacturing firms (36)	0.947	0.877	0.897	0.830	0.723
Small IPOs (27)	0.975	0.833	0.762	0.785	0.624
Medium IPOs (26)	0.947	0.953	0.989	0.957	0.910
Large IPOs (26)	0.886	0.852	1.128	0.754	0.833

Panel C: Median wealth relatives for different holding periods

Holding period (months)	1-12	13-24	25-36	1-24	1-36
All firms (79)	0.843	0.928	0.948	0.857	0.789
IPO year 1984-1985 (9)	0.919	0.667	1.002	0.575	0.591
IPO year 1986-1987 (19)	0.935	0.694	0.981	0.738	0.800
IPO year 1988-1989 (51)	0.828	0.991	0.879	0.882	0.739
Investment companies (20)	0.849	1.146	1.182	0.868	0.989
Financial industry (9)	0.977	0.973	1.291	0.885	0.846
Trade and other services (14)	0.823	0.861	0.849	0.710	0.579
Manufacturing firms (36)	0.802	0.937	0.823	0.876	0.670
Small IPOs (27)	0.801	0.928	0.744	0.802	0.480
Medium IPOs (26)	0.874	0.970	1.110	0.924	0.875
Large IPOs (26)	0.844	0.986	1.235	0.882	0.992

implies than an IPO has underperformed the market. The analysis uses all observations which have at least one month of aftermarket performance in the indicated holding period. The results suggest that an overwhelming majority of the IPO firms have wealth relatives of less than one, especially for the 1–12 and 13–24-month holding periods. The negative abnormal performance would seem to level off in the third aftermarket year, when both the mean and the median wealth relatives are relatively close to one.

Ritter (1991) finds that negative abnormal aftermarket performance tends to be concentrated in IPOs issued in high-volume years. In table 5 the sample is divided into three categories according to the IPO year: 1984–1985, 1986–1987, and 1988–1989. The results suggest that long-run aftermarket performance is relatively similar for IPOs issued in different years in Finland, although the number of IPOs issued differs substantially. The results are qualitatively similar if the data are divided into three periods with approximately the same number of observations in each (results not reported here). It could be argued, however, that the *whole sample period* is characterized by an exceptionally high level of IPO volume. Ekholm (1985) reports that, in all, there are three IPOs in Finland in the pre-sample years 1960–1983. There have only been three IPOs after the sample period (August 1, 1989 to December 31, 1992), and all of them occurred in 1989. Therefore, a caveat is in order when the results are generalized to truly low-volume IPO years.

In table 5 the sample is divided into four sectors: manufacturing firms, trade and other services, the financial industry, and investment companies (including real estate investment companies). In all business sectors the wealth relatives are generally less than one. Moreover, the sample is split according to issue size so that each class contains a roughly equal number of companies. The negative abnormal performance is concentrated in small companies. This is consistent with the findings of Ritter (1991), who reports a similar relationship for U.S. IPOs.

7. Conclusions

The evidence from 80 initial public offerings (IPOs) in Finland supports Rock's (1986) model, which predicts that the winner's curse figures importantly in initial IPO returns. The average initial excess return, unadjusted for the bias in allocation, is 8.7%, whereas average allocation-weighted returns range from – 5.3 to 5.1%. Subscribers who place small orders are given greater proportional allocations than those who place large orders. As a consequence the average return pattern is a function of the size of the order: very small orders produce insignificantly positive allocation-weighted average returns, whereas large orders generate significantly negative returns. The economic significance of the positive average returns is small, since they are at best less than 225 FIM (\approx U.S.\$45).

The lawsuit-avoidance hypothesis advanced by Ibbotson (1975) and Tinic (1988) is not a likely explanation for the observed initial returns in Finland. Because of the characteristics of Finnish law, subscribers to Finnish IPOs have much less incentive than subscribers to U.S. IPOs to take legal action if the prospectus contains false or inadequate information about the issuing firm. Despite a generally low standard of information content and reliability in their prospectuses, the sample firms seem unlikely to incur legal liabilities.

The sample firms substantially underperform a value-weighted index in the long run. A strategy of investing in IPOs on the first trading day and holding them for 36 months from the IPO would have left the investor with only 79 cents for each dollar invested in the Helsinki Stock Exchange (HSE) value-weighted index. The IPO firms perform even worse when the HSE equally-weighted index is used as a benchmark.

An analysis of four business sectors suggests that the long-run underperformance is not industry-specific. Moreover, the results are relatively similar for IPOs issued in different years in Finland, although the IPO activity differs substantially. The negative abnormal performance is concentrated in small companies.

The simultaneous existence of the winner's curse and long-run IPO underperformance is puzzling. If one examines only the short-run returns and the winner's curse, the IPO market would seem to function quite rationally: seemingly positive initial excess returns turn into insignificantly positive or negative returns. This interpretation is challenged by the evidence of negative long-run aftermarket performance, which is consistent with recent studies by Aggarwal and Rivoli (1990), Ritter (1991), and Levis (1992). Although the market-adjusted returns are calculated over long intervals and hence are sensitive to the benchmark used in the analysis, the evidence would seem to justify an alternative interpretation of the rationality of the IPO market as well. Since the Finnish IPO market was exceptionally active in the sample period, it could be argued that the results reflect a temporary overoptimism by IPO investors that turned into disappointment when they learned more about the IPO firms' prospects. Additional evidence from other countries is needed before the results can be interpreted more conclusively.

Appendix

Characteristics of a sample of 80 Finnish IPOs issued during the period January 1, 1984 to July 31, 1989

Company name	Offering date	Gross proceeds (1,000 FIM) ^a	Initial excess return	36-month total returns			Wealth relative	Over-subscribed?
				Raw	HSE	Raw		
Ajanmies	4/21/86	5,685	-0.124	-0.727	1.354	0.116	no	
Apollo	3/8/88	29,532	-0.523	-0.442	-0.399	0.928	yes	
Asuntorahoitus ^b	3/20/89	36,036	0.020	n.a.	n.a.	n.a.	no	
Chips	12/7/87	71,603	-0.014	-0.578	-0.199	0.527	yes	
Citycon	8/22/88	51,643	0.005	-0.388	-0.403	1.025	yes	
Cornex	8/24/87	14,815	-0.095	-0.623	0.035	0.365	yes	
Etelä-Saimaan Kust.	5/15/89	23,774	0.060	-0.695	-0.511	0.625	no	
Fazer-Musiikki	5/29/85	23,973	-0.035	-0.580	-0.533	0.900	yes	
Finlandia Interface	11/15/88	17,381	0.026	-0.729	-0.479	0.520	no	
Jackman	5/9/88	93,617	0.384	-0.559	-0.372	0.702	yes	
Hartwall	4/24/89	71,269	0.003	-0.381	-0.573	1.447	yes	
HIT	4/1/85	12,064	0.050	1.312	2.172	0.729	no	
Insinööriutiset	9/12/88	32,671	-0.031	-0.084	-0.144	1.069	yes	
Interbank	9/29/88	58,072	-0.018	-0.578	-0.537	0.910	yes	
Interpolator	5/16/88	10,638	0.241	-0.952	-0.381	0.077	yes	
Investia	5/16/88	23,641	-0.303	-0.499	-0.423	0.868	no	
Isko	10/31/88	30,453	-0.171	-0.808	-0.499	0.383	no	
Itikka	9/12/88	71,465	0.060	-0.380	-0.386	1.011	yes	
Juva	5/12/86	5,920	0.190	1.149	1.225	0.966	yes	
Jämerä-Kiinteistö	2/11/88	120,627	-0.251	-0.263	-0.131	0.848	no	
Kesla	11/30/87	9,939	0.190	-0.645	-0.192	0.440	yes	
Kesätunturi	10/4/88	14,866	-0.168	-0.891	-0.479	0.208	no	
Kyöpyläkasino	11/23/87	29,448	0.050	0.040	-0.185	1.277	yes	
Labsystems	11/19/84	34,669	0.020	-0.544	1.523	0.181	no	
Larox	11/30/87	18,160	0.045	-0.205	-0.285	1.111	yes	
Lemminkäinen	5/18/89	159,822	-0.057	-0.675	-0.563	0.742	yes	
Leo Longlife	4/11/88	19,070	0.133	-0.650	-0.303	0.503	yes	

Lihopolar	8/22/88	77,465	0.411	-0.593	-0.375	0.652	yes
Mancon	1/14/85	29,030	0.100	0.332	1.808	0.475	yes
MIT	5/7/84	62,147	0.118	0.298	1.387	0.544	no
Muurame	11/30/87	15,951	0.089	-0.900	-0.228	0.130	yes
OKO	4/17/89	220,490	0.345	-0.378	-0.568	1.439	yes
Ovi	5/18/87	15,199	1.014	-0.017	-0.006	0.990	yes
OPR	10/15/86	91,603	0.032	0.193	0.451	0.822	yes
OP-Sijoitus	3/30/88	36,014	-0.060	-0.407	-0.326	0.880	yes
Piretta	11/28/88	32,538	-0.044	-0.011	-0.426	1.723	no
Plandent	10/19/88	23,415	-0.147	-0.728	-0.485	0.528	yes
Pohjois-Karjalan Kp.	11/16/87	27,607	-0.004	-0.328	-0.234	0.878	no
Rakentajain Konev.	5/30/88	21,560	0.222	-0.485	-0.329	0.767	yes
Rautaruukki ^c	6/7/89	383,388	0.074	-0.447	-0.479	1.061	yes
Santasalo	10/12/88	26,760	-0.014	-0.486	-0.482	0.994	yes
Sensor	1/20/88	120,798	-0.094	-0.057	-0.153	1.113	no
Siltasaari-Invest	2/1/88	36,068	-0.316	-0.152	-0.129	0.974	no
SKOP	9/5/88	574,913	0.158	0.944	1.943	0.660	yes
Skop-Rahoitus	8/15/84	153,631	0.154	-0.741	-0.440	0.463	no
Sonkari	6/7/88	13,572	1.450	-0.759	-0.316	0.353	yes
Sophistics	10/3/88	27,003	0.468	-0.850	-0.477	0.286	yes
Spontel	12/12/84	66,207	0.370	2.087	1.450	1.260	yes
SP-Sijoitus	1/6/86	27,415	-0.198	4.292	1.482	2.132	no
SSK	11/14/88	47,161	-0.155	-0.205	-0.536	1.713	no
Starckjohann	4/3/89	86,526	-0.031	-0.649	-0.519	0.729	no
StoryFilmi	11/7/88	14,211	0.163	-0.912	-0.499	0.176	no
Stromsdal	5/16/89	22,198	-0.089	-0.345	-0.557	0.125	no
STS-Invest	4/27/87	44,776	0.118	-0.526	0.102	0.431	yes
Suomen Kint.inv.	2/8/88	57,901	-0.284	-0.264	-0.458	1.358	no
Suomen Optiopörssi	5/27/88	8,496	0.493	-0.711	-0.340	0.434	yes
Suomen Pörssikiint.	1/14/88	168,319	-0.056	-0.200	0.050	0.762	no
Suomen Viestintäk. ^d	8/29/88	95,822	0.146	-0.367	-0.283	0.883	yes
Suomen Vuolukivi	8/29/83	39,190	0.052	-0.594	-0.393	0.669	yes
SYP-Invest	9/24/84	138,889	0.100	1.776	2.095	0.897	no
SYR	6/11/84	176,056	0.092	0.584	1.679	0.591	no
Säikkivaline	10/12/87	26,250	0.443	0.262	-0.141	1.469	yes
Talberg-Kiinteistöt	11/2/87	39,080	0.010	-0.102	-0.235	1.174	yes
Talouselämä	11/7/88	20,440	0.161	-0.131	-0.133	1.002	yes

Appendix (continued)

Company name	Offering date	Gross proceeds (1,000 FIM) ^a	Initial excess return	36-month total returns			Over-subscribed?
				Raw	HSE	Wealth relative	
Teknopiste	11/17/86	3,664	-0.018	-0.853	0.219	0.121	no
Terrasilvana ^c	6/1/87	17,546	0.599	1.765	0.172	2.359	yes
Tervakosken Puuh.	11/30/88	12,746	-0.042	-0.552	-0.540	0.974	no
Tietotehdas	2/8/84	30,753	0.516	0.391	1.033	0.684	yes
Tunturiyöriä	8/15/88	18,721	0.183	-0.672	-0.399	0.546	yes
Tuomo Halonen	10/10/88	39,721	-0.236	-0.836	-0.506	0.332	yes
Turun Arvokiint.	5/16/88	63,830	-0.111	-0.154	-0.343	1.288	no
Unic	4/26/88	12,157	0.191	-0.091	-0.316	1.329	yes
Vaisala	6/13/88	36,280	-0.068	-0.566	-0.318	0.636	yes
Valmet ^c	8/15/88	823,944	-0.157	-0.735	-0.399	0.441	no
Venator Invest	6/10/88	46,984	0.177	-0.278	-0.016	0.711	yes
Viatek	6/6/88	12,338	1.002	-0.462	-0.327	0.799	yes
Vital-Invest	8/17/87	5,556	0.099	-0.989	0.417	0.008	yes ^c
Watostek	11/2/88	47,365	-0.191	-0.705	-0.519	0.614	no
YIT-kiinteistöt	11/16/87	44,172	0.110	0.265	-0.234	1.652	yes
Yliselektronikka	10/10/88	14,228	-0.099	-0.675	-0.479	0.624	yes

^aGross proceeds are calculated from the minimum number of shares offered to the public and are measured in terms of the purchasing power of the June 1991 FIM.

^bAftermarket data are not available.

^cDenationalization.

^dTwo classes of shares were offered as a package. This package is treated as a single observation.

^eTwo classes of shares with different voting power were offered separately to the public. Only the class with superior voting power is considered in the analysis.

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