



# Initial Public Offerings: Evidence from the British, French and Swedish Property Share Markets

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## **Abstract**

This paper investigates the underpricing and long-run performance of initial public offerings (IPOs), using a unique sample consisting of 54 British, French and Swedish property companies, which became publicly listed during the period 1984–1999. Similar to common stock IPOs, the European property share IPOs in our sample outperformed the benchmark on the first day of trading, on average with 2.55 percent. However, these property share IPOs tend to underperform their benchmark over the twelve-month period subsequent to the initial offering. We also examine explanatory factors such as issue size, the degree of debt financing, ex-ante uncertainty, and the underlying property types of the companies involved. The results are in line with those previously found for common stocks.

**Key Words:** IPO underpricing, equity issues, property companies

## **1. Introduction**

Numerous studies have examined the performance of initial public offerings (IPOs) and documented the existence of short-run excess returns in combination with long-run underperformance. Ibbotson (1975) was among the first to report on the so-called “underpricing” of IPOs by documenting initial excess returns of 11.40 percent on U.S. common stock IPOs.<sup>1</sup> Studies on the long-run aftermarket price behavior, such as Ritter (1991) and Aggarwal and Rivoli (1990), showed that this initial outperformance appears to be a short-run phenomenon. The winner’s curse theory, signaling-based models, and the theory that IPO performance is driven by fads have been used to attempt to explain this puzzling abnormal price behavior. However, numerous unanswered questions remain.

This paper tests implications derived from existing theories by studying a unique data set consisting of 54 European property companies from France, Sweden and the United Kingdom that became publicly listed during the period 1984–1999. We investigate whether the classical abnormal price behavior surrounding IPOs also exists in these

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European property share markets. Furthermore, we attempt to answer some of the research questions concerning the IPO-puzzle.

The paper is organized as follows. The next section discusses the related literature and states the theoretical implications that can be derived from this literature. Section 3 describes the sample collection procedures. In Section 4 we picture the institutional environments of the three national markets in our study. Section 5 gives an overview of the empirical results regarding the initial day price behavior. Section 6 reports our findings concerning the aftermarket price behavior, and Section 7 concludes.

## 2. Literature

A common explanation for the abnormal first day price behavior is the so-called “winner’s curse”. In Rock’s (1986) model the IPO market contains two investor types; well-informed investors, who have superior knowledge about the true value of the issue and less-informed investors, who lack the special knowledge to correctly value the issue. This information asymmetry causes a “lemons problem” where the uninformed investors are left with the less successful IPOs. In order to keep badly informed investors interested in the IPO market, issuing firms are required to sell at a discount.<sup>2</sup> An explanatory factor directly derived from this winner’s curse is the size of the issue. The larger the issue the more professionally it is likely to be managed and the more information about the true value will be available. This wider spread of information decreases the information asymmetry among investors. Because of this lower information asymmetry, these larger IPOs have less reason to underprice and are expected to show less initial outperformance.

A second factor that might explain the abnormal price behavior of IPOs is the degree of debt financing. Smith and Watts (1992) argued that firms with high growth potential will rely less on debt financing. This low reliance on debt financing is caused by their higher risk profiles, which make the debt market less accessible. When these growth companies go to the stock market during an IPO, the public will consider them more risky and will demand a higher risk premium in the form of more underpricing. Thus, we expect IPOs with the lowest debt ratios in our sample to be associated with the highest initial returns.

Another issue related to the underpricing of IPOs is the amount of uncertainty concerning the true value of the company involved. Alli et al. (1994) have examined this relationship by studying initial aftermarket price behavior of financial institutions. Since financial institutions are monitored by regulatory agents, the information asymmetry problem and the ex-ante uncertainty regarding true value should be less severe for financial institutions than for non-financial institutions. This proved to be the case. Because the value of property companies should reflect the value of their underlying property portfolio, we would expect property IPOs to be underpriced less severely than common stock IPOs.

A theory that could explain the long-run underperformance is the so-called “fads theory”. Both Aggarwal and Rivoli (1990) and Ritter (1991) reported strong underperformance of IPOs after three years of  $-13.73$  percent and  $-29.13$  percent, respectively. Both studies point out that the abnormal price behavior of IPOs might be

due to overoptimistic investors, who expect high excess returns, but sell the shares acquired in the IPO whenever their high expectations are not fulfilled in the longer run. This so-called fad causes extremely high demand in the early aftermarket, but at the same time drives the disappointed investors to sell their shares, thereby causing the long-run underperformance.

Some specific features of property shares should be taken into account. Wang et al. (1992) were the first to investigate the presence of IPO underpricing in a property share market. They reported a statistically significant average abnormal return of  $-2.99$  percent on the first day of trading for the U.S. REIT market. Ling and Ryngaert (1997) also investigated the U.S. REIT market and reported that REIT IPOs issued between 1991 and 1996 were underpriced, on average, by 3.60 percent. The differing results of these two studies imply that the question whether property share IPOs suffer from abnormal price behavior is still open.

Our paper extends the research of Wang et al. (1992) and Ling and Ryngaert (1997), by investigating European property share markets. Following Wang et al. (1992), we use the aftermarket standard deviation to quantify the ex-ante uncertainty surrounding the true value of the issue. We expect companies with high aftermarket standard deviations to be associated with higher initial day returns. Ling and Ryngaert (1997) also pointed out that the ex-ante uncertainty about the value of a new property issue could vary depending on the type of properties owned by the company. Retail property, for instance is often regarded as being more risky than residential property. Thus, we include property type as an additional factor that explains IPO price behavior.

### 3. Sample design

By combining the Global Property Research database with Bloomberg, Reuters and Datastream we found 72 property investment companies going public in the period 1984–1999 in Europe. The only countries in which the number of IPOs was large enough for meaningful statistical analysis were France, Sweden and the United Kingdom, which is why this study focuses on these three countries. After excluding spin-offs of existing listed companies and property developers we collected data concerning first day opening and closing prices and aftermarket returns for the remaining companies from Datastream, the *Financial Times* and from the property companies themselves. Furthermore, we asked the three national stock exchanges for assistance in locating the required data. These efforts resulted in a data set of 54 property share IPOs in the three largest European property share markets. Table 1 provides a distribution of the sample by country and by year. Besides the daily prices we also obtained information on the offering size, the pre-offer debt ratios, the aftermarket standard deviation and the underlying property type.

To adjust the property share returns for movements in the general property stock markets we used the GPR General National indices for the corresponding European countries. The GPR General National indices are total return indices of property shares, tracking the performance of all property investment companies in the corresponding

Table 1. Sample distribution by country and by year.

Country	Number of IPOs		
<i>A: Sample distribution by country</i>			
France	17		
Sweden	13		
United Kingdom	24		
Total: 54			
<i>B: Sample distribution by year</i>			
Year	Number of IPOs	Year	Number of IPOs
1984	1	1992	7
1985	1	1993	3
1986	1	1994	9
1987	1	1995	0
1988	1	1996	5
1989	10	1997	6
1990	3	1998	3
1991	2	1999	1
Total: 54			
<i>C: Tax regimes</i>			
France	33 percent		
Sweden*	28 percent		
United Kingdom*	23–31 percent		

\*The exact corporate tax rate for U.K. property companies depends on profit level and company structure.

countries. These indices are available on a monthly basis, with December 1983 as base-month.

#### 4. Institutional environments

The three European property share markets in our sample both differ and correspond in many respects. The U.K. market is the oldest and largest property share market in Europe, experiencing a relatively stable average annual return of 13.97 percent over the sample period. The companies in our sample are all pure equity property investors, who do not invest in mortgages. The institutional holdings in these companies vary drastically but are high compared to the Swedish and French markets. The majority of the U.K. IPOs in our sample date from the post-1992 period after the U.K. recovered from the real estate crisis of the early nineties. Listed property companies in the U.K. face corporate tax rates varying from 23 percent to 31 percent, depending on profit levels and company structure.

The Swedish property share market on the other hand is a lot younger and has been extremely turbulent over the sample period. As can be seen in Figure 1, an investment in a

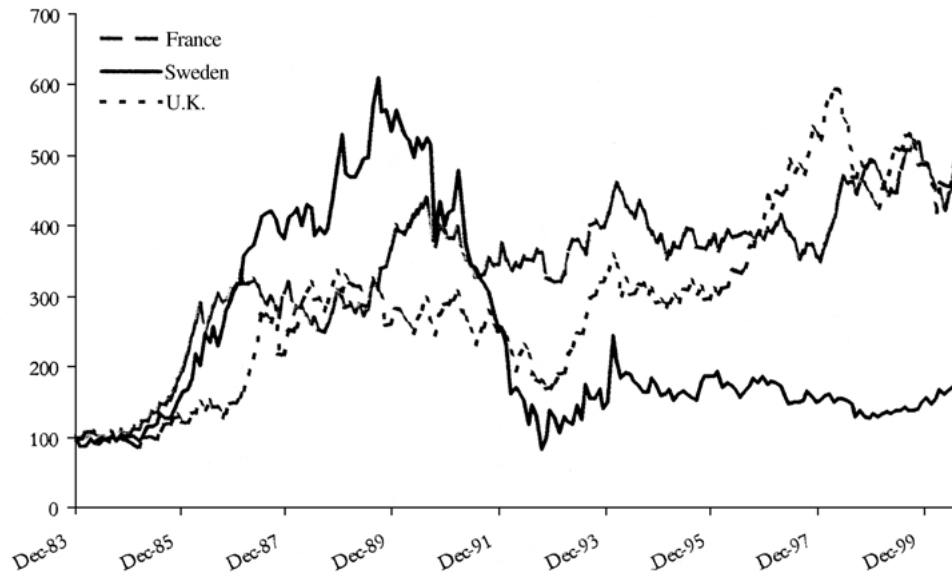


Figure 1. Market development of the French, Swedish and U.K. property share markets.

Swedish property share in 1984 would have surged sixfold in the following six years. However, this swift gain would have evaporated during the subsequent years. This volatile behavior is typical of the Swedish market, which has had many listings that were poorly structured in the late eighties. Several of these property companies had to leave the market in the early nineties when Sweden was struck by a recession. The institutional involvement in listed property companies in Sweden is relatively low compared to the U.K. and France. Swedish property companies face a corporate tax rate of 28 percent.

The third market of our study, the French market, has been the most stable over the sample period, yielding an average annual return of 11.71 percent. Most of the French IPOs in our sample are from the pre-1992 period, and the majority was strictly monitored by larger holding companies that ensured financing and thereby took away a lot of uncertainty for investors. The French property companies are subject to the national corporate tax rate of 33.33 percent.

## 5. Initial-day returns

### 5.1. Summary statistics

The initial day returns are calculated by dividing the difference between the offering price and the closing price by the offering price. To correct these raw first day returns for movements in the overall property share markets we subtracted the average daily GPR-General return of the corresponding country. The results are presented in Table 2.

Table 2. Initial day returns.

Sample	Initial Returns (percent)	GPR-General Returns (percent)	Initial Abnormal Returns (percent)	t-Statistic
Total	2.60	0.05	2.55*	3.26
Pre-1992	0.10	0.05	0.05	0.08
Post-1992	4.94	0.05	4.89*	4.18
U.K.	4.12	0.05	4.07*	3.62
France	0.82	0.05	0.77	0.61
Sweden	1.79	0.04	1.75	0.81

*Notes.* This table provides average returns for the first trading day for subsamples of property share IPOs and the average daily GPR-General index returns. The initial abnormal returns are calculated by taking the difference between the two. Initial abnormal returns marked with \* are significant at the 5 percent level.

For the sample as a whole we find a statistically significant initial abnormal return of 2.55 percent, on average. This outcome conforms to the findings of Ling and Ryngaert (1997), who documented an initial abnormal return of 3.60 percent for the U.S. REIT market. Compared to the initial day returns of common stocks found in the literature, this 2.55 percent is rather modest, which supports the notion that the more transparent and therefore less risky property share issues are associated with significantly less underpricing than the more risky common stock IPOs. But although the extent of the underpricing is modest it is still significant and offers the investor an attractive return, even after correcting for transaction costs, which nowadays amount to approximately 40 basis points.

The move towards the European Monetary Union (EMU) in 1992 has had a significant impact on the European property share markets. Investors increasingly regard Europe as one market and have moved towards a more pan-European investment strategy, which has enhanced liquidity. However, given the fact that a French investor knows more about the French property market than about, say, the Swedish market, pan-European investment strategies are likely to increase differences in the level to which participating investors are informed concerning property share IPOs. This may cause property shares to be more susceptible to the winner's curse and exhibit stronger IPO underpricing. Indeed, we find the post-1992 IPOs in our sample to be underpriced by 4.89 percent, whereas the pre-1992 IPOs were not underpriced at all.

We also found initial day returns varying strongly across different countries. These cross-national differences can be explained by comparing differences in market structure and maturity. British IPOs produced a statistically significant initial abnormal return of 4.07 percent. The French IPOs, which are strongly monitored by holding companies hardly outperformed their benchmark on the first day of trading.

Table 3 reports the summary statistics on initial day returns for the full sample and for various subsamples. These subsamples are chosen to facilitate the investigation of the importance of different factors potentially affecting IPO underpricing: issue size, debt ratio, standard deviation, and sector specialization of the property portfolio. Initial abnormal returns are positive for each sub-sample. Table 3 shows that small issues are

indeed associated with more underpricing than large issues. The average initial abnormal return for the small issues of 3.05 percent is significantly different from zero.

The table also shows that issues with lower debt ratios outperform the market index more strongly than issues with higher debt ratios. These differences confirm the implications derived from Smith and Watts (1992).

Ex-ante uncertainty appears to play a role in IPO underpricing. Issues belonging to the group with the highest aftermarket standard deviation are associated with high initial abnormal returns: 5.37 percent versus no significant first-day outperformance for the group with the lowest aftermarket standard deviation.

Finally, concerning the underlying property type, we discovered that specialized companies show a somewhat higher initial abnormal return than diversified companies, while they vary strongly among the different property types. Property companies specialized in managing retail property, for instance, yield an average initial day return of 4.39 percent, whereas companies specialized in office properties do not perform differently than the market index.

### 5.2. Multivariate analysis of initial day returns

The summary statistics of Table 3 suggest that small issues, issues with low debt ratios, and companies specialized in retail property entail more uncertainty about their true value and are therefore associated with higher initial day returns. But to truly isolate the impact of the different variables on the initial abnormal returns, multivariate regression analysis is needed. For every parameter we compute OLS-estimations of the coefficients, using the following model:

$$\begin{aligned} \text{IAR} = & a + b_1 \text{Size} + b_2 \text{Debt ratio} + b_3 \text{Ex-ante uncertainty} + b_4 \text{Specialized} \\ & + b_4 \text{Retail} + b_5 \text{Office} + b_6 \text{Residential} + b_7 \text{Post-1992} + b_8 \text{UK} \\ & + b_9 \text{Sweden} + \varepsilon. \end{aligned} \quad (1)$$

Table 4 reports the regression results. In order to minimize the influence of outliers we use a log specification for issue size, debt financing and aftermarket standard deviation. For these first three variables, the signs of the coefficients are consistent with the results reported in the summary statistics. Issues of lesser size, with smaller debt ratios and higher aftermarket standard deviations are indeed associated with more underpricing. The coefficients of the specialization dummy and the underlying property type are also in line with the results presented in Table 3. Finally, we look at the explanatory power of a post-1992 dummy variable and on two nationality dummies. The coefficient of the post-1992 dummy confirms our previous findings that the more recent IPOs are indeed associated with a higher initial day return. The signs of the coefficients of the nationality dummies give support to the national differences we reported in Table 2. The model has an adjusted *R*-squared of 65 percent.

Table 3. Summary statistics initial day returns.

Issue Size	Initial AR (percent)	<i>t</i> -Statistic	<i>N</i>
<i>A: Size factor</i> †			
Small, < 80 mln Euro	3.05*	2.82	25
Medium	2.87	1.44	10
Large, > 180 mln Euro	1.41	1.83	19
<i>Debt Ratio</i>			
<i>B: Debt ratio factor</i> ‡			
High, > 0.49	2.02	1.70	18
Low, < 0.49	3.16*	2.18	36
<i>Standard Deviation</i>			
<i>C: Ex-ante uncertainty proxy</i> §			
High, > 3.00%	5.37	1.89	19
Medium	2.45*	2.83	21
Low, < 1.50%	0.69	0.98	14
<i>D: Specialization/Property type factor</i>			
Diversified	1.97*	2.36	20
Specialized	2.26*	2.07	34
Office	−0.08	−0.09	13
Retail	4.39*	2.57	10
Residential	10.12*	3.02	5

†Size is measured in total capitalization of the tissue.

‡The debt ratio is computed by dividing the pre-offer total debt by the pre-offer market value of the firm.

§The ex-ante uncertainty proxy is equal to the standard deviation of the returns of the first 20 trading days.

|| Specialization is determined by looking at the asset portfolio of the company. Companies having more than 80 percent of their total assets in one property type are considered specialized.

Initial abnormal returns marked with \* are significant at the 5 percent level.

Table 4. OLS regression of initial abnormal returns on independent variables.

	Coefficients
Intercept	−0.07** (0.03)
Log of issue size	−0.00 (0.00)
Log (1 + percent debt financing)	0.05 (0.03)
Log of aftermarket standard deviation	2.31* (0.68)
Specialized dummy (yes = 1, no = 0)	0.01 (0.01)
Retail dummy (yes = 1, no = 0)	0.00 (0.02)
Office dummy (yes = 1, no = 0)	−0.02 (0.02)
Residential dummy (yes = 1, no = 0)	0.08* (0.02)
Post-1992 dummy (yes = 1, no = 0)	0.01 (0.02)
UK dummy (yes = 1, no = 0)	0.02 (0.02)
Sweden dummy (yes = 1, no = 0)	−0.02 (0.02)
<i>R</i> <sup>2</sup>	0.65

Notes. The heteroskedasticity-consistent standard errors of the corresponding coefficient estimates are given between brackets. Coefficient estimates marked with \* are significant at the 5 percent level, coefficient estimates marked with \*\* are significant at the 10 percent level.



Table 5. Cumulative abnormal returns.

Period	Total		France		Sweden		U.K.	
	CAR (%)	<i>t</i> -Statistic	CAR (%)	<i>t</i> -Statistic	CAR (%)	<i>t</i> -Statistic	CAR (%)	<i>t</i> -Statistic
Month 1	0.84	0.55	0.39	0.17	-0.01	0.00	1.58	0.87
Month 2	1.38	0.56	-1.78	-0.77	0.57	0.12	3.82	0.84
Month 3	0.59	0.22	-1.91	-0.62	1.46	0.36	1.74	0.34
Month 4	-0.96	-0.36	-1.78	-0.39	-4.06	-0.82	1.18	0.27
Month 5	-2.06	-0.70	-1.21	-0.26	-1.40	-0.26	-2.94	-0.59
Month 6	0.27	0.08	-1.94	-0.41	8.53	1.16	-2.61	-0.52
Month 7	-3.30	-1.02	-3.09	-0.69	2.78	0.35	-6.60	-1.33
Month 8	-2.45	-0.80	-4.86	-1.05	2.13	0.27	-3.29	-0.75
Month 9	0.36	0.10	-6.73	-1.65	14.03	1.38	-2.20	-0.47
Month 10	1.03	0.29	-3.15	-0.73	17.40	1.89	-4.81	-0.97
Month 11	0.21	0.05	-7.25	-1.58	21.44	1.80	-6.06	-1.16
Month 12	-1.29	-0.29	-12.62	-2.52	18.89	1.49	-4.53	-0.87

Notes. The cumulative abnormal returns (CARs) are computed by applying the formula:

$$CAR_t = \sum_{i=1}^I \left( \frac{1}{n} \sum_{i=1}^n \left( \frac{P_{it} - P_{it-1}}{P_{it-1}} - \frac{P_{bt} - P_{bt-1}}{P_{bt-1}} \right) \right),$$

where  $P_{it}$  is the price of the stock  $i$  on day  $t$  and  $P_{bt}$  is the price of the benchmark on day  $t$ .

## 6. Aftermarket returns

In addition to the short-run outperformance of IPOs, the literature also documents long-run underperformance. We now turn to that issue, using three separate methods for analysis. We first look at the mean cumulative abnormal returns<sup>3</sup> (CARs) for varying time periods. Secondly, we investigate buy-and-hold returns, and lastly, we look at wealth relatives.

The results of the CAR analysis are presented in Table 5 and show that the CARs for our sample as a whole decrease over a longer time period and lead to a negative twelve-month CAR of -1.29 percent, on average. The initial outperformance documented for the first day of trading only lasts for three months. Furthermore, Table 5 shows that there are large differences between the national subsamples. British and French IPOs exhibit the traditional IPO price behavior by underperforming after the first year year, with -4.53 percent and -12.62 percent respectively. Swedish IPOs, on the other hand, outperformed considerably after twelve months. This difference can be explained by the fact that the Swedish property share market has been in a different phase than the more stable and mature French and British property share markets. The Swedish property share market has gone through rough times in the early nineties, leading to relatively low benchmark returns that were easily exceeded by the Swedish aftermarket IPO-returns.

Dissanaike (1994) has shown that the cumulation process involved in computing CARs can give biased outcomes. Therefore we also compute excess buy-and-hold returns for various time horizons. The outcomes of these computations are presented in Table 6.

Table 6. Excess buy-and-hold returns.

Period	Total		France		Sweden		U.K.	
	EBHR (%)	<i>t</i> -Statistic	EBHR (%)	<i>t</i> -Statistic	EBHR (%)	<i>t</i> -Statistic	EBHR (%)	<i>t</i> -Statistic
Month 1	0.88	0.58	0.39	0.17	0.12	0.03	1.58	0.87
Month 2	1.69	0.66	-2.17	-0.93	1.24	0.26	4.40	0.92
Month 3	0.58	0.21	-2.32	-0.72	1.95	0.43	1.72	0.33
Month 4	-1.43	-0.53	-2.16	-0.47	-4.65	-0.90	0.70	0.16
Month 5	-2.63	-0.90	-1.76	-0.36	-0.92	-0.17	-4.07	-0.83
Month 6	0.26	0.08	-1.31	-0.28	8.53	1.18	-3.02	-0.59
Month 7	-4.29	-1.29	-3.79	-0.83	0.92	0.11	-7.32	-1.48
Month 8	-3.96	-1.19	-5.81	-1.19	1.02	0.11	-5.37	-1.16
Month 9	-1.05	-0.28	-8.68	-2.04	14.60	1.45	-4.30	-0.85
Month 10	-0.95	-0.26	-4.30	-1.02	15.89	1.71	-7.56	-1.46
Month 11	-0.81	-0.18	-8.31	-1.95	24.64	2.03	-9.25	-1.65
Month 12	-0.55	-0.12	-10.76	-2.51	22.16	1.78	-5.83	-1.04

Notes. The excess buy-and-hold returns (EBHR) are calculated by applying the formula:

$$EBHR = \frac{1}{n} \sum_{i=1}^n \left( \frac{P_{i0}}{P_{it} - P_{i0}} - \frac{P_{b0}}{P_{bt} - P_{b0}} \right),$$

where  $P_{it}$  is the price of stock  $i$  on day  $t$ ,  $P_{i0}$  is the initial day offering price of stock  $i$ ,  $P_{bt}$  is the benchmark price on day  $t$  and  $P_{b0}$  is the initial day offering price of the benchmark.

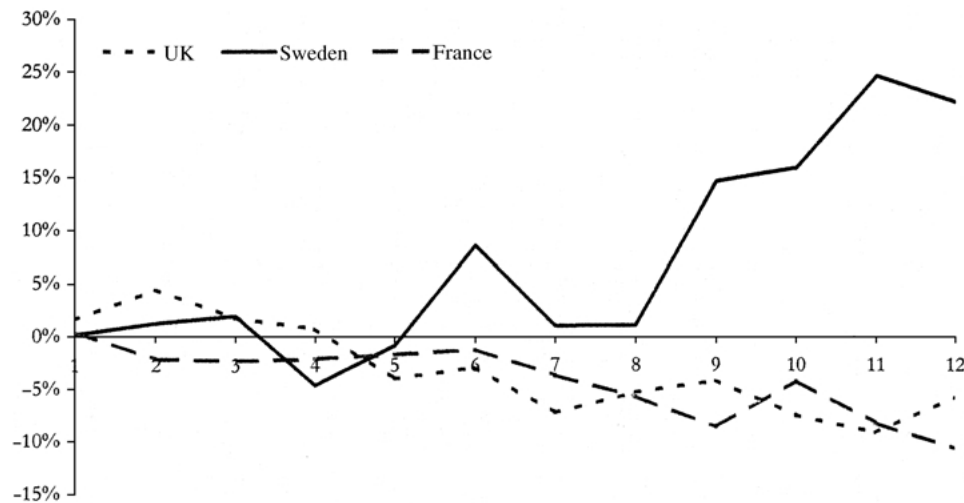


Figure 2. Aftermarket performance of the French, Swedish and U.K. property share IPOs in excess buy-and-hold returns.

Table 7. Wealth relatives.

	Company (%)	Benchmark (%)	Wealth Relative
<i>A: Mean buy-and-hold returns</i>			
Month 1	1.38	0.54	1.01
Month 2	4.16	2.47	1.02
Month 3	4.88	4.31	1.01
Month 4	4.33	5.77	0.99
Month 5	3.27	5.90	0.98
Month 6	6.61	6.98	1.00
Month 7	4.77	9.06	0.96
Month 8	5.27	9.23	0.96
Month 9	8.84	9.89	0.99
Month 10	5.99	6.94	0.99
Month 11	7.68	8.49	0.99
Month 12	6.28	9.07	0.97
<i>B: Median buy-and-hold returns</i>			
Month 1	0.00	0.94	0.99
Month 2	0.40	2.37	0.98
Month 3	2.12	5.37	0.97
Month 4	1.77	5.79	0.96
Month 5	1.53	6.35	0.95
Month 6	6.14	4.30	1.02
Month 7	2.64	3.55	0.99
Month 8	4.98	4.89	1.00
Month 9	2.21	5.24	0.97
Month 10	2.81	1.69	1.01
Month 11	1.11	5.67	0.96
Month 12	3.10	5.39	0.98

*Note.* The wealth relatives are computed by dividing 1 plus the buy-and-hold return of the property shares by 1 plus the corresponding buy-and-hold return of the GPR-General index.

Similar to the CARs the excess buy-and-hold returns also decrease strongly over time and the short-run outperformance is turned into a long-run underperformance. Again, as is illustrated in Figure 2, we find striking differences in the national subsamples where the British and French IPOs underperform and the Swedish IPOs outperform in the long run.

Having calculated the excess buy-and-hold returns we can derive the wealth relatives both for the mean and for the median buy-and-hold returns. Table 7 presents these wealth relatives. In accordance with studies of Ritter (1991) and Gerbich et al. (1999) we find short-run wealth relatives slightly above one in combination with twelve-month wealth relatives significantly below one.

The results of all three methods indicate that the short-term outperformance we documented in Section 4 lasts only during the first few months of trading. For longer periods we find significant underperformance.

To further examine the relationship between short-term outperformance and long-run underperformance, we divide the European sample into subsamples based on the four

Table 8. Summary statistics of excess buy-and-hold returns.

Factor\Time	1	3	6	9	12
<i>A Size</i> <sup>†</sup>					
Small, < 80 mln Euro	−0.49%	−0.49%	−3.35%	−6.40%	−7.79%
	(−0.23)	(−0.11)	(−0.68)	(−1.12)	(−1.17)
Medium	2.76%	7.29%	4.22%	3.81%	12.20%
	(0.62)	(0.93)	(0.92)	(0.55)	(1.47)
Large, > 180 mln Euro	2.13%	−3.96%	1.35%	−0.71%	−2.01%
	(0.76)	(−1.00)	(0.18)	(−0.10)	(−0.23)
<i>B Debt</i> <sup>‡</sup>					
High, > 0.49	1.81%	−2.01%	−0.30%	−1.17%	−1.87%
	(0.70)	(−0.44)	(−0.07)	(−0.19)	(−0.30)
Low, < 0.49	0.64%	1.24%	2.63%	1.52%	1.96%
	(0.27)	(0.30)	(0.61)	(0.30)	(0.31)
<i>C Aftermarket standard deviation</i> <sup>§</sup>					
High, > 300 percent	2.74%	5.19%	4.71%	3.34%	5.90%
	(0.42)	(0.49)	(−0.49)	(−1.30)	(−1.43)
Medium	−0.06%	−4.24%	0.51%	2.03%	2.55%
	(−0.03)	(−1.15)	(0.11)	(0.34)	(0.34)
Low, < 1.50 percent	0.55%	2.50%	−3.28%	−7.68%	−8.74%
	(0.64)	(0.86)	(0.88)	(0.42)	(0.58)
<i>D Specialization and property type</i> <sup>  </sup>					
Diversified	2.95%	0.20%	−2.64%	−2.42%	−1.46%
	(1.30)	(0.06)	(−0.44)	(−0.32)	(−0.17)
Specialized	−0.38%	0.66%	1.97%	−0.16%	−0.13%
	(−0.16)	(0.14)	(0.42)	(−0.03)	(−0.02)
Office	1.93%	1.10%	−0.44%	−2.94%	0.13%
	(0.58)	(0.18)	(−0.07)	(−0.45)	(0.02)
Retail	−7.54%	−1.62%	0.34%	−9.33%	−16.71%
	(−2.07)	(−0.16)	(0.04)	(−1.32)	(−1.66)
Residential	7.04%	−1.85%	7.77%	16.05%	18.84%
	(1.50)	(−0.22)	(0.73)	(1.40)	(1.53)

Notes. Time periods are stated in months.

<sup>†</sup>Size is measured as capitalization of the issue.

<sup>‡</sup>The debt ratio is computed by dividing the pre-offer total debt by the pre-offer market value of the firm.

<sup>§</sup>The ex-ante uncertainty proxy is equal to the standard deviation of the returns of the first 20 trading days.

<sup>||</sup>Specialization is determined by looking at the asset portfolio of the company. Companies having more than 80% of their total assets in one property type are regarded specialized. The *t*-statistics are given between brackets.

variables we discussed before: issue size, degree of debt financing, aftermarket standard deviation and underlying property type. We calculate mean abnormal buy-and-hold returns for each of these subsamples and provide the results in Table 8. Comparing the results in this table with those given in Table 3 shows that initial day outperformance and long-run underperformance are closely related. For example, regarding the size factor we again find the smallest issues having the more abnormal price behavior: they exhibit a twelve-month excess buy-and-hold return of  $-7.79$  percent, whereas the largest issues in our sample underperform their benchmark only mildly, with  $-2.01$  percent, on average.

Table 9. OLS regression of twelve-month excess returns on independent variables.

	Coefficient
Intercept	-0.45 (0.34)
Log of issue size	0.06 (0.05)
Log (1 + percent debt financing)	-0.09 (0.39)
Log of aftermarket standard deviation	7.99 (5.06)
Specialized dummy (Yes = 1, no = 0)	0.15 (0.14)
Retail dummy (yes = 1, no = 0)	-0.37** (0.18)
Office dummy (yes = 1, no = 0)	-0.16 (0.15)
Residential dummy (yes = 1, no = 0)	-0.01 (0.13)
Post-1992 dummy (yes = 1, no = 0)	-0.11 (0.21)
UK dummy (yes = 1, no = 0)	0.16 (0.23)
Sweden dummy (yes = 1, no = 0)	0.19 (0.20)
$R^2$	0.20

*Notes.* The heteroskedasticity-consistent standard errors of the corresponding coefficient estimates are given between brackets. Coefficient estimates marked with \*\* are significant at the 10 percent level.

Furthermore, Table 8 shows that the companies with high debt ratios and low aftermarket standard deviation underperform their benchmark more severely than those with the low debt ratios and high aftermarket standard deviation.

Concerning the last factor, portfolio specialization, the general conclusion is that diversified companies seem to underperform more strongly than their specialized competitors.<sup>4</sup> But also among the specialized companies considerable differences in long-run performance exist. Companies specialized in residential properties tend to outperform in the long run, whereas companies specialized in retail property underperform significantly after twelve months. However, given the small sample sizes these results are offered with caution.

To isolate the impact of the individual factors, we also ran multivariate regressions on the twelve-month excess buy-and-hold returns and the identified factors. The results of these regressions, stated in Table 9, confirm the cross-sectional differences we reported in Table 8. The factors issue size, debt ratio and aftermarket standard deviation are positively related to the aftermarket price performance, whereas the results for the specialization dummy are mixed. The positive sign of the post-1992 dummy indicates that the more recent IPOs in our sample perform best in the longer run. The nationality dummy confirms our previous findings that nationality of the IPO does make a difference.

## 7. Conclusion and suggestions for further research

This paper documents the price behavior of 54 European property share IPOs. We find an overall excess return of 2.55 percent on the first trading and a modest underperformance after twelve months. Evidence presented in this paper is consistent with the winner's curse hypothesis of Rock (1986). Large issues, which are likely to be managed more

professionally, are underpriced less and exhibit less abnormal long-run underperformance. Furthermore, we also found that IPOs with the highest aftermarket standard deviation, a proxy for the ex-ante uncertainty, are underpriced more severely and are associated with the best long-run performance. The modest size of the abnormal price behavior of the IPOs in our sample is consistent with theories that claim that less risky IPOs experience less severe abnormal price behavior.

The results also show that IPO underpricing of European property companies was much stronger after 1992 than before that year. This may well be caused by the fact that European integration, which gained speed in that period, has led to more pan-European property share investment. Our results suggest that stronger international involvement in IPOs has led to more information differences, and therefore to more influence of the winner's curse. An extension of this research could therefore be to investigate the relationship between the international involvement in IPOs and their underpricing.

## Notes

1. For a broad discussion of empirical evidence regarding initial aftermarket price behavior of IPOs, see Smith (1986).
2. Keloharju (1993) and Michael and Shaw (1994) tested Rock's theory for the U.S. common stock market, and found strong support for the existence of a winner's curse.
3. For IPOs that are delisted prior to their three-year anniversary, the total return is calculated up to the delisting date.
4. This is in line with results for United States REITs documented by Eichholtz, Op 't Veld and Schweitzer (2000).

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