THE UNDERPRICING OF SPANISH REITs WHEN GOING PUBLIC

Leticia Castaño[a], José E. Farinós[b] and Ana M. Ibañez [c]

[a] *Departamento de Contabilidad, Universidad de Valencia, Av. dels Tarongers s/n, 46022 -Valencia (España)*

[b] *Departamento de Finanzas Empresariales, Universidad de Valencia, Av. dels Tarongers s/n, 46022 -Valencia (España)*

[c] *Departamento de Finanzas Empresariales, Universidad de Valencia, Av. dels Tarongers s/n, 46022 -Valencia (España)*

B) Valoración y Finanzas.

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This study analyses underpricing in a sample of 41 REITs from the Spanish market between November 2013 and January 2019. The results show a significant raw mean initial-day return of 1.58% (1.37% for the primary market). However, price adjustment continues until the third day with a raw buy-and-hold return of 2.58% (2.63% and 2.45% adjusted for IGBM and FTSE EPRA/NAREIT *Spain*, respectively). This underpricing is not accounted for by the theories of information asymmetry but instead by some signalling theories related to capital structure, by the pre-listing stock market conditions and by the peculiarities of the market analysed.

1. Introduction

The increase in the price of the shares at the initial time of listing, or underpricing, is one of the topics that has most interested researchers in recent decades. In the case of *Real Estate Investment Trusts* (REIT) this phenomenon has been investigated separately from the other companies, as the specific characteristics of these investment vehicles entail less uncertainty in their valuation (Hartzell, Kallberg, & Liu, 2005).[1] As we discuss in the third section, from 1992 to date numerous studies conducted in different markets have found a positive and significant increase in the price of REIT shares on the first day of trading.

This study analyses the existence of underpricing of REITs when they were listed on the Spanish stock market during the period November 2013 to January 2019 and investigates the underlying explanatory factors. The sample comprises all the admissions carried out on the Spanish Alternative Stock Market (*Mercado Alternativo Bursátil* – MAB).[2] One of the differentiating characteristics of this market with respect to those previously studied is that the flotations were not carried out through an Initial Public Offering (IPO) but through a direct listing. However, some REITs have opted for a private placement of shares prior to market entry (up to 6 months before), which has allowed us to split the sample into two segments according to whether the REITs analysed performed a private placement prior to market entry or not.

The raw initial-day return obtained is significant with a mean value of 1.58% (1.44% and 1.41% when adjusted for the Madrid Stock Exchange General Index (IGBM) and the FTSE EPRA/NAREIT Spain, respectively). We break down the first trading day underpricing into the primary and secondary markets (Gokkaya, Highfield, Roskelleym, & Steele, 2015) and find a significant underpricing of 1.37% and 0.27%, respectively. This mean initial-day underpricing is maintained if we split the sample between the REITs that performed previous private placement (2.21%) and those that did not (1.31%) and although it is greater in the first case, the difference between the two is only significant at 10% using the bootstrap methodology. However, although we have found that the main price adjustment occurs at the initial moment of trading (first fixing), it continues until the third day. Thus, the buy-and-hold return for that period is 2.58% (2.63% and 2.45% when adjusted for IGBM and FTSE EPRA/NAREIT Spain, respectively).

Likewise, by testing a series of hypotheses based on different theories reported in the literature, we have obtained empirical evidence that the pre-listing stock market conditions, the proportion of shares held by executive positions (*signalling theory*) and the fact that the members of the board of directors of the REIT fix the reference price for the beginning of trading based on the equilibrium price determined by the appraiser (differentiating feature of the MAB) all have a significant relationship with the level of underpricing. However, we have obtained no evidence that the *ex ante* uncertainty about the value of the company is related to the underpricing level.

The importance of the real estate sector in the economic structure of Spain, the strong interest in this sector on the part of international investors, the significant weight of Spanish REITs in Europe and the increase in the number of stock market flotations of these companies are some of the main reasons that have led us to analyse underpricing in REITs that go public in Spain.

This paper makes several contributions to the literature. Firstly, as far as we know, this is the first study to analyse the underpricing of REITs in Spain when going public on an individual basis,[3] which allows it to be compared with that of other widely studied markets. The recent incorporation of this type of institution into Spanish legislation has so far not allowed us to have a sufficiently large sample of REITs on which to carry out empirical studies individually. Secondly, underpricing is analysed by breaking it down into primary and secondary market returns, which has only been studied in this way in the REITs of the US market (Gokkaya et al., 2015). Finally, it is the first research to analyse the phenomenon of underpricing in REITs during a

complete post global financial crisis period (2014-2018), a crisis that began in the real estate sector, which is relevant for the Spanish market, and later extended to the financial sector.

The rest of the paper is organised as follows. Section 2 describes the arrival of REITs in Spain and the characteristics of the market in which they are listed. Section 3 examines the empirical evidence on the underpricing of REITs. The theoretical framework and hypotheses are described in section 4. Sections 5 and 6 describe the sample and the methodology used, respectively. The results obtained are shown in section 7. Section 8 concludes.

2. The development of the REIT market in Spain

REITs first appeared in the United States in the 1960s and some years later, in 1971, this vehicle reached Australia. The development of REITs in Asia, Canada and Europe has taken place over the last two decades and continues to do so in various countries classified as "nascent", such as Costa Rica, Bulgaria, Oman, Philippines, Pakistan or India (Ernst & Young, 2018). Table 1 shows the composition of the REIT market around the world (EPRA, 2018b).

INSERT TABLE 1

In Europe, the establishment of REITs occurred as a result of regulatory changes introduced by different countries in the real estate investment industry. Although the process of becoming established gradually advanced [France, 2003; Germany, 2007; United Kingdom, 2007; Italy, 2007; Finland, 2009; Spain, 2009; Ireland, 2013; and Belgium, 2014; among others (EPRA, 2018a)], it took time to prosper because in many cases it coincided with the global financial crisis. As a consequence, REITs did not arouse the interest of the investment community. However, in the last five years there has been a strong growth in Europe in terms of both number and capitalisation.

In Spain, REITs were introduced by means of Spanish Law 11/2009 (Reino de España, 2009) in order to stimulate the Spanish real estate market and provide real estate investments with liquidity. However, the restrictions imposed on these companies in that legislation made this figure unattractive and the first REITs did not reach Spain until the end of 2013, as a result of the amendment of said law in 2012. Law 16/2012 (Reino de España, 2012) introduced greater flexibility, less restrictive conditions and certain tax advantages for this type of company, which led to the creation of these investment vehicles in Spain.[4] The number and size of these

companies has grown exponentially in recent years, especially in 2017 and 2018 (see Graph 1).

INSERT GRAPH 1

At the end of 2018, Spanish REITs ranked fourth in Europe in terms of market capitalisation, with 12.38%, only surpassed by the United Kingdom (34.63%), France (25.98%) and the Netherlands (13.18%), and first in terms of the number of REITs, as shown in Table 2 (EPRA, 2018b).

INSERT TABLE 2

Historically, real estate activity in the Spanish economy has always been relevant. The weight of real estate activities over the total GDP in Spain during the period analysed (2014-2018) has reached around 10% from the supply side (according to data from the Spanish National Statistics Institute). Likewise, investment in the real estate sector in Spain in 2018 exceeded 20,000 million euros (12,000 million euros excluding corporate operations), 56% more than in 2017, thus reaching a new record for the fifth consecutive year. Foreign direct investment amounted to 11,800 million euros, representing 61% of the total volume of investment in this sector. REITs invested about 5,000 million euros, 25% of the total, while the rest was national investment (CBRE, 2018). These figures reflect the growing attractiveness of this sector for international investors. In this regard, it is worth highlighting the presence of foreign investors on the Spanish stock exchange, with 46% ownership of the listed Spanish companies and an 80% participation in the turnover traded on the Spanish stock markets at the close of 2018 (Bolsas y Mercados Españoles, 2018c).

In the last two years, 2017 and 2018, the real estate sector accounted for 76% and 79% of the number of flotations on the Spanish stock market, respectively. If we only take into account the admissions of REITs, these figures stand at 68% and 75%, respectively.

The amendment of the legislation concerning REITs in Spain in 2012 made some of the requirements for these vehicles more flexible in order to enhance what had been a totally inoperative system up to that time. Spanish Law 16/2012 introduced the possibility for REITs to be admitted on a Multilateral Trading Facility (MTF), and not only on a regulated market. As a result, in February 2013 a specific segment dedicated to REITs was created in the Spanish Alternative Stock Market (MAB), the Spanish MTF. In this regard, of the 73 REITs existing in the Spanish market as of 31 January 2019, 68 were incorporated within the MAB as opposed to the 5 admitted to the Spanish regulated market, more widely known as the *Mercado Continuo*, *SIBE* or *Bolsa de Valores*.[5]

The MAB has a far more flexible regulation than the *Mercado Continuo* in terms of admission and trading requirements, without foregoing an adequate level of transparency (see Table 3).

INSERT TABLE 3

It is worth highlighting the presence of two figures in this market, namely: the Registered Advisor (RA) and the Liquidity Provider (LP). The main functions of the Registered Advisor (specialised professionals who act as interlocutors between companies and the market) are to assess the suitability of companies for admission and to give advice on the compliance required by the market (Bolsas y Mercados Españoles, 2016). The main task of the Liquidity Provider is to favour the liquidity of transactions and achieve a sufficient liquidity frequency (Bolsas y Mercados Españoles, 2017). Trading is mainly carried out multilaterally and electronically in the SIBE-SMART (the same electronic system as the one used in the Mercado Continuo) through a trading system called fixing.[6]

Finally, in order to enter the market, there is no obligation to make an Initial Public Offering of shares (IPO) if, prior to entry, the requirement concerning the minimum free floating capital set out above in Table 3 is met (Bolsas y Mercados Españoles, 2018a).[7] In this respect, until now, all REITs in this market have been incorporated by direct listing. In these cases, the price taken as the initial price for admission (reference price) does not come from a placement, but is determined by the board of directors of the REIT based on the valuation of the company carried out by an independent expert (appraiser) (Bolsas y Mercados Españoles, 2018a). In some cases, however, a private placement of shares occurs prior to listing for trading. If said placement complies with the requirements established in Circular 2/2018 of the MAB (Bolsas y Mercados Españoles, 2018a), the reference price for the initial trading of the company's shares on the market will be the price of the aforementioned placement.

3. Empirical evidence of underpricing in REITs

The underpricing that occurs when a firm goes public is one of the most interesting topics in the financial literature. The first studies documenting the presence of underpricing in IPOs date from the 1970s in the US market (Ibbotson & Jaffe, 1975; McDonald & Fisher, 1972; Reilly & Hatfield, 1969). In recent years, researchers have analysed this underpricing from different points of view, proposing several theories that attempt to explain the reason for the existence of these initial-day positive returns. The most notable papers include those by Beatty & Ritter (1986), Loughran & Ritter

(2004, 2002), Ritter & Welch (2002), Rock (1986) and Welch (1989).

With regard to the underpricing of REITs, although there are a large number of studies that analyse the matter, the majority refer to the North American market or the Asia-Pacific area. In recent decades, although there has been a proliferation of studies on underpricing in the real estate sector in European markets, few of them deal with REITs because in Europe they became popular at a later date.

As observed in Table 4, the results on the underpricing of REITs are very diverse, ranging from a negative mean initial-day return of -2.82% (Wang, Chan, & Gau, 1992) to a positive mean return of 11.82% (Ooi, 2009). Among the studies shown in Table 4, two that are worth highlighting are those by Chan, Chen, & Wang (2013) and Brobert (2016), since they include the European market in their analysis of the underpricing of REITs worldwide (with a significant mean underpricing in Europe of 6.74% and 6.55%, respectively). Ascherl & Schaefers (2018) analysed underpricing during the period 2000-2016 in a sample of 78 IPOs carried out by real estate companies and 29 REITs in the European market, their results showing a significant mean initial-day return of 5.69% and 2.02%, respectively. Gokkaya et al. (2015) is the only one that analyses the underpricing of REITs in the US market by breaking down the initial-day return into primary and secondary market returns.

INSERT TABLE 4

Regarding the Spanish market, although there are some studies on the real estate sector (Akin, Montalvo, García Villar, Peydró, & Raya, 2014; Gimeno & Martínez-Carrascal, 2010; McGreal & Taltavull de La Paz, 2012; Rodríguez & Bustillo, 2010; Taltavull de la Paz, 2014; Taltavull de La Paz & White, 2016), this is not the case for REITs. The recent creation of this vehicle, and consequently the reduced sample that was available up until now, is, as far as we know, the reason why it has been impossible to analyse it empirically. Thus, we find descriptive articles on REITs in Spain (Fernández, Llovera, & Roig, 2012; Roig Hernando & Soriano Llobera, 2015; Taltavull de La Paz & Cuenca, 2013) but few of an empirical nature (Marzuki & Newell, 2018) and none referring to analyses of their underpricing.

4. Theoretical framework and hypotheses

There is a significant body of academic literature on the theories explaining underpricing. Ritter & Welch (2002) classify them mainly in three groups: asymmetric information models, symmetric information models and a third group of novel theories (which could also be classified in the two previous groups). Yet, regardless of whether they are based on information asymmetry, on agency theories, behavioural

explanations, ownership-control relationship, signalling theories, institutional factors, etc., all of them start out with the existence of an Initial Public Offering of shares when they are launched on the stock market in order to substantiate the underpricing. Therefore, and since one of the most relevant differences in the Spanish REIT market lies in the non-existence of IPOs in their entry into the MAB, because it occurs through direct listing, we do not expect to find underpricing in the price set by the issuer (Derrien & Kecskés, 2007). This leads us to formulate the following hypothesis:

- ***H1.a.*** *As there is no initial public offering of shares, no underpricing is expected in the price set by the issuer.*

However, within this direct listing, some REITs have chosen to perform a private placement of shares (up to six months) before going public. Sharpe & Woo (2005) find underpricing due to the existence of information asymmetry in the listing of Australian companies that carried out a private placement six months prior to their flotation (although less than in the case of companies that performed an IPO). Therefore:

- ***H1.b.*** *REITs that perform a previous private placement of shares will be underpriced, unlike REITs that do not.*

Finally, and following Gokkaya et al. (2015), these hypotheses will be tested by distinguishing between primary and secondary market returns.

As the results obtained show the existence of underpricing in the price determined by the issuers in the listing of REITs on the stock exchange in Spain, both for those that performed a previous private placement and for those that did not, we have selected a series of variables and put forward some hypotheses to be tested on the factors that can explain this underpricing. These variables and hypotheses have been selected within the context of the different existing underpricing theories and are designed to cover the specific characteristics of this type of investment vehicle and the peculiarities of the market where they are listed.

Within the theories of information asymmetry, and following Beatty & Ritter (1986), we assume that the greater the *ex ante* uncertainty about the value of the company is, the greater the underpricing will be. The first approximation to the *ex ante* uncertainty that we propose, and which has to do with the characteristics of the issuing company, is size. Following Dimovski et al. (2017), we have used market capitalisation as a proxy variable of firm size, admitting that large companies transmit a lower degree of uncertainty (Ibbotson, Sindelar, & Ritter, 1994).

- **H2.a**. *The larger the size of the issuing company is, the lower the underpricing will be.*

We have also taken into account the level of leverage as a measure of *ex ante* uncertainty. Brounen & Eichholtz (2002) and Dimovski & Brooks (2006b), following Ling & Ryngaert (1997), argue that the higher a company's level of leverage is, the fewer opportunities for growth there will be and therefore it will be easier to value it. Likewise, the higher the level of leverage is, the more supervision or monitoring there will be. Based on the above, we propose the following hypothesis:

- **H2.b**. *The higher the company's level of leverage is, the lower underpricing will be.*

In general, it is considered that there is greater uncertainty in younger companies since the lack of historical background makes it more difficult to make forecasts about the future (Ascherl & Schaefers, 2018; Dimovski et al., 2017). The age of the company is particularly important in this market since it has an influence on the obligation to provide audited financial information or only forecasts when joining it. Thus:

- **H2.c**. *The older the company is, the lower the expected underpricing will be.*

Finally, we propose the last hypothesis about *ex ante* uncertainty. Another group of theories determine that the presence in the listing process of a reputable agent, whether an auditor (Bairagi & Dimovski, 2011; Beatty, 1989; Dimovski et al., 2017; Titman & Trueman, 1986) or an underwriter (Carter & Manaster, 1990; Chen & Lu, 2006; Ling & Ryngaert, 1997), mitigates informational asymmetry. In order not to lose their prestige, reputable agents, who have a greater capacity to analyse companies, seek less risky issuances by introducing information into the market and decreasing the *ex ante* uncertainty about the value of the company (Tiniç, 1988). Investors can deduce that an issue is of higher quality and/or less speculative if it is backed by a reputable agent. Given the specific characteristics of our study, in which there is no IPO in the listing process and there is no underwriter, and from the perspective that the specialist agents involved in the offer transmit information about its value, we have deemed it relevant to include the company's valuing entity as a reputable agent, replacing the underwriter (Roosenboom, 2012). This agent values the company and sets a stock price that serves as the basis on which the board of directors of the REIT determines the reference price for the listing on the market.

Likewise, and given the fact that REITs are obliged to engage the services of a Registered Advisor (see Table 3), we have also included this figure as a reputable agent. In the absence of a specific ranking to measure the prestige of these specialist agents, we have developed our own (see Appendix 1), following the methodology developed by Migliorati & Vismara (2014). For each type of agent, a hierarchical criterion has been used based on the number of entries in which the agent has participated. Therefore, based on the fact that by choosing a reputable agent, the REIT is signalling the value of the company and reducing uncertainty (Michaely & Shaw, 1994), we expect that:

- **H2.d.** *The higher the prestige of the agent (appraiser, registered advisor or auditor) is, the lower the underpricing will be.*

The following hypothesis could be included within the signalling theories. Thus, one of the signalling tools used by companies, related to the capital structure, is the proportion of shares held by executives. Grinblatt & Hwang (1989) and Leland & Pyle (1977) establish that the fraction of shares held by shareholders in executive positions is a vehicle for conveying private information to investors. Hence, the bigger the proportion of shares held by executives is, the greater will be the value and/or quality they are granting to the company. Likewise, assuming that the higher the percentage of shares held by executives is, the lower the external monitoring will be, and that greater underpricing attracts minority investors and makes it possible to reduce monitoring by large investors (Brennan & Franks, 1997; Wu, 2004), we propose the following hypothesis:

- **H3.** *The higher the percentage of shares retained by shareholders in executive positions is, the lower the underpricing will be.*

The following group of hypotheses relate underpricing to the stock market and industry environment. Several papers study the relationship between returns on the first day of trading and movements in the market in the weeks prior to entry (Brouwen & Eichholtz, 2002; Dimovski et al., 2017; Wong & Ong, 2013). To measure it, we have used the Madrid Stock Exchange General Index (IGBM), which represents the general performance of the stock market in Spain. The following hypothesis has been formulated assuming that a high average return prior to the listing is indicative of an optimistic market (Miller & Reilly, 1987):

- **H4.a**. *The greater the pre-listing stock market return is, the greater the underpricing will be.*

Within the variables that relate underpricing to the stock market sentiment, following Brobert (2016) and Ascherl & Schaefers (2018), we have considered whether listing takes place in a period of *hot* (*cold*) market when there have been ten or more (fewer) flotations in the year the REIT was launched on the market. Accordingly, we test the following hypothesis:

- **H4.b**. *Underpricing will be greater when the listing occurs during a hot market.*

As for the industry conditions prior to the listing (Dimovski & Brooks, 2006a, 2006b), the positive evolution of rental income in Spain in the months prior to the listing is indicative of an optimistic market. The returns in the first few days of trading are expected to be in line with this behaviour. We therefore propose the following hypothesis:

- **H4.c**. *The more positive the evolution of the industry is prior to the listing, the greater the underpricing will be.*

Finally, we have included a series of hypotheses regarding the characteristics of REITs and the peculiarities of the market in which they are listed.

In relation to the property strategy followed by REITs, Brobert (2016), Brounen & Eichholtz (2002), Chen & Lu (2006) and Gokkaya et al. (2015) find that REITs with a diversified property strategy are more underpriced than those that follow a specialised strategy because the latter are easier to value. Accordingly, we propose the following hypothesis:

- **H5.** *Underpricing is greater when the property strategy is diversified.*

Following Chan et al. (2013) and Chen & Lu (2006), greater underpricing is expected in internally managed REITs than in the case of those with external management. Hence:

- **H6.** *Underpricing is greater when the management of the company is internal.*

Finally, Roosenboom (2012) analyses how underwriters use several different valuation methods to determine the fair value of the company prior to setting the price of the IPO, a price that is usually finally set below the fair value obtained. He finds

that, among other factors, part of the underpricing stems from this intentional discount on the price. In line with this author we state the following hypothesis:

- ***H7.*** *Underpricing is greater when the reference price is equal to or less than the equilibrium price determined by the appraiser.*

5. Sample

In order to compose the final sample used in this study, we started out with all the REITs that had been listed in the MAB since the creation of their own particular segment on 15 February 2013 until 31 January 2019.[8] During this period, there have been 71 admissions. From this initial sample, we have discarded those companies that have not traded on the first day or have only done so through block trading, as the latter is not considered an official closing price. As a result, the sample was reduced to 43 REITs. Finally, we have eliminated two more companies from the sample because they are considered outliers with respect to the initial-day return (IR).[9] Hence, the final sample consists of 41 REITs.

Given the special characteristics of the market, and since the REITs in the sample have not selected the option of going public through an IPO but instead by direct listing, we have considered it relevant to segment the sample according to whether or not there was a previous private placement in order to be able to study the underpricing that exists in said listing. To make up the subsample with previous private placement (PPP), based on MAB Circular 2/2018 (Bolsas y Mercados Españoles, 2018a), the REITs were classified as such if, within the six months prior to the application for admission of their shares, they carried out a placement of shares or a financial transaction in which the consideration for the sale of the shares is in cash and not for credit compensation, and when the price was equal to the reference price for the start of trading in the company's shares on the market. Altogether 12 REITs carried out previous private placement. The remaining 29 REITs form part of the subsample without previous private placement (non-PPP).

Data on market admissions, financial information and other information about the REITs were obtained from the Informational Document on Admission to the Market (IDAM) and the relevant facts available on the MAB website. The stock market data are from the Bolsas y Mercados Españoles Group, with the exception of the FTSE EPRA/NAREIT Spain index, which was obtained from the Thomson Reuters Datastream database.

6. Methodology

Underpricing (univariate analysis)

We have measured the underpricing of the shares of REITs going public by the return on the first trading day, Initial-day Return *(IR$_i$)*, obtained as the relative difference between the closing price of share *i* on the first day of trading (P_{ic}) and the reference price (P_{ir}) as shown in expression (1).

$$IR_i = (P_{ic} - P_{ir})/P_{ir} \qquad (1)$$

In addition, *IR$_i$* has been adjusted by the market return. Two indices have been used for this purpose: the Madrid Stock Exchange General Index (*AR IGBM*), indicative of the general performance of the Spanish market, and the FTSE EPRA/NAREIT Spain (*AR EPRA*), indicative of the specific performance of REITs in the Spanish stock market.

Following Barry & Jennings (1993) and Bradley, Gonas, Highfield, & Roskelley (2009) in the case of non-REIT companies and Gokkaya et al. (2015) in the case of REITs, we have split the initial-day return into two components: the return generated in the primary market or reference-to-open return, primary market return (*PR$_i$*), and the return generated in the secondary market or open-to-close return, secondary market return (*SR$_i$*), computed in accordance with expressions (2) and (3) respectively.

$$PR_i = (P_{io} - P_{ir})/P_{ir} \qquad (2)$$

$$SR_i = (P_{ic} - P_{io})/P_{io,} \qquad (3)$$

where P_{io} is the opening price or the price of the first fixing on the first day of trading of company *i*. Likewise, the buy-and-hold return *(BHR$_{i\tau}$)* has been calculated for the four days after entry in accordance with expression (4).

$$BHR_{i\tau} = [\textstyle\prod_{t=1}^{\tau}(1 + R_{it})] - 1, \qquad (4)$$

where τ is the period in days. The abnormal buy-and-hold return of REIT *i* ($BHAR_{i\tau}$) was calculated in accordance with expression 5.

$$BHAR_{i\tau} = BHR_{i\tau} - BHR_{index,\tau}, \qquad (5)$$

where $BHR_{index,\tau}$ is the buy-and-hold return of either the Madrid Stock Exchange General Index or the FTSE EPRA/NAREIT Spain.

The null hypothesis to be tested is that the mean (median) of the cross-section of the returns is equal to zero. To test the mean, we have used a parametric test based on the conventional *t* statistic. In addition, in order to make our results more robust, we employ the bootstrap methodology (Efron, 1982; Wehrens, Putter, & Buydens, 2000), which generates the empirical distribution of the returns under the null hypothesis, thereby relaxing the hypotheses of normality, seasonality and temporal independence of the observations. With regard to the median, we use the Wilcoxon signed rank test. To calculate the differences between the mean values we have performed the parametric *t* test and the bootstrap methodology. The difference in the medians was tested using the Kruskal-Wallis test.

Explanatory factors (multivariate analysis)

The explanatory variables selected to test the hypotheses set out in section 4 are shown in Table 5. Table 6 offers a summary of the main characteristics of the sample.

INSERT TABLE 5

In general, we observe that the REITs in the sample could be defined, if we compare them with other studies on this type of company (Ascherl & Schaefers, 2018; Dimovski et al., 2017; Dimovski & Ratcliffe, 2011), as small, young enterprises, with a medium level of leverage and with a reduced percentage of shares held by executives. On the other hand, the stock market conditions in Spain could be described as bearish during the sample period. The opposite happens with the evolution of the pre-listing sector, since it would be a bullish market.

INSERT TABLE 6

We explore the factors that explain REITs' underpricing through several multiple regression models, in which the dependent variable is the buy-and-hold return until the third day of trading (BHR_{i3}) in accordance with expression (6).[10]

$$BHR_{i3} = \alpha + \sum_{j=1}^{m} \beta_j \ X_{ij} + \varepsilon_{i,} \qquad (6)$$

where (BHR_{i3}) is the buy-and-hold return until the third day of trading of company *i* calculated in accordance with expression (4) and X_{ij} are the independent variables that correspond to the selected explanatory variables.

In order to minimise the influence of extreme values on expression (6), the natural logarithms of the variables SIZE (LNSIZE), AGE (LNAGE) and DEBT (LN

(1+DEBT)) have been used (Brobert, 2016; Brounen & Eichholtz, 2002; Ling & Ryngaert, 1997).[11]

Each regression model has been estimated by cross-sectional Ordinary Least Squares (OLS), applying the methodology proposed by White (1980) to obtain a robust estimation of the parameters in the presence of heteroscedasticity. Additionally we have used the bootstrap procedure (Fox, 2008), as we have a small sample size. For the same reason, we considered it appropriate not to include more than 7 explanatory variables in the same model. To analyse the absence of multicollinearity among the regressors, we have used Spearman's *Rho* correlation coefficient among the different variables of each model (see Appendix 2).[12] We have also used the Variance Inflation Factor (VIF).

7. Results

Underpricing (univariate analysis)

The results obtained in the analysis of the underpricing in the listing of the REITs are shown in Table 7. We note that underpricing does exist at listing, since we found a significant mean IR of 1.58%. The results in terms of market-adjusted returns are also positive and significant values around this figure. The median is also positive and significant. These results are contrary to what was stated in hypothesis H1.a, in which, in the absence of a public offering, no underpricing was expected in the price fixed by the issuer at the time of the listing. If we compare our results with the results in other markets (Table 4), the mean IR of Spanish REITs is within the wide range of underpricing reported in these studies. It is also close to that of 1.71% obtained by Londerville (2002) in the Canadian market, that of 1.20% observed by Dimovski & Brooks (2006b) in the Australian market and the figure of 2.02% obtained by Ascherl & Schaefers (2018) for REITs in the European market. Conversely, our result of 1.58% is well below that of 9.87% obtained by Soler, Farinós & Ibañez (2015) in their analysis of the underpricing for non-REIT companies that went public on the MAB during the period 2009-2014.

INSERT TABLE 7

Subsequently, and following Barry & Jennings (1993) and Bradley et al. (2009) in the case of non-REIT companies, and Gokkaya et al. (2015) in the case of REITs, Table 8 shows the results of the underpricing when we break down the initial-day return (IR) into primary (PR) and secondary (SR) return.

INSERT TABLE 8

In Table 8 it can be seen that the PR presents positive and significant mean and median values, which is not the case with the SR. As we can see in Panel B of Table 8, the initial-day and primary market returns have significantly higher means and medians than the secondary return on the first day of trading, since most of the initial-day return (83%) occurs during the first fixing or first moment of trading. That is, it is the original shareholders and/or those who took part in the previous private placement who are rewarded on the first day of trading. However, unlike what happens in the analysis carried out by Gokkaya et al. (2015) on the US market, in which the underpricing is resolved in the primary market, in our case the underpricing continues until the third day of trading, as will be seen later in Table 11.

In Table 9 and Table 10 we can see the results obtained with respect to the underpricing obtained by dividing the sample into the REITs that have carried out previous private placement (PPP) and those that have not (non-PPP). In Table 9 we observe that for both subsamples the raw and adjusted returns are positive and significant. In Panel B, we see that, in line with hypothesis H1.b, the average return of the subsample with PPP is higher than the sample without previous placement. However, since this difference is only significant at 10% using the bootstrap methodology, these results must be interpreted with caution.

INSERT TABLE 9

Table 10 exhibits the results obtained in the breakdown of the initial-day return with the segmented sample. They are in line with those obtained for the full sample (Table 8).

INSERT TABLE 10

Finally, in view of the results obtained, and in order to analyse whether the underpricing extends beyond the first trading session, we have calculated the adjusted raw return for each of the four days following market entry using the closing prices for each session. In addition, we calculated the buy-and-hold return, both raw and market adjusted, from the first day to each of the first five days of trading. Table 11 shows that both the mean and the median (in brackets) of the raw and the market-adjusted returns of the days after the listing, despite being lower than the initial ones, are positive and significant until the third day of trading. That is to say, although the main adjustment in the price occurs on the first trading day, it continues until the third day. Thus, the buy-and-hold return for the third day of trading is 2.58% (2.63% and 2.45% adjusted for IGBM and FTSE EPRA/NAREIT Spain, respectively).

INSERT TABLE 11

Determining factors (multivariate analysis)

The results obtained for the eight estimated regression models are shown in Table 12. The F-statistic allows us to confirm that there is a significant linear relationship between the buy-and-hold return until the third day of trading and the explanatory variables taken together. In no model does the Variance Inflation Factor (VIFi) exceed a value of 5, so there are no multicollinearity problems between the explanatory variables.

INSERT TABLE 12

As for the variables that approximate the level of uncertainty, we observe that neither SIZE nor AGE are statistically significant. In the first case, the results are contrary to those obtained by Dimovski et al. (2017), who show that there is positive and significant evidence of a relation between the size or capitalisation of REITs and underpricing. In the case of age, Ascherl & Schaefers (2018) and Dimovski et al. (2017) conclude that older companies experience less underpricing. Finally, the negative sign of the coefficient of the DEBT variable confirms hypothesis H2.b, which suggests that the most levered companies are subject to greater supervision or monitoring, have fewer opportunities for growth, are easier to value and therefore experience less underpricing. However, the weak evidence of the relationship between the DEBT variable and underpricing means that it cannot be considered a relevant factor. Our results are in line with those obtained in other studies on REIT underpricing, such as those by Brounen & Eichholtz (2002), Dimovski & Ratcliffe (2011) and Ling & Ryngaert (1997).

With regard to the variables associated with the prestige of the specialist agents involved in the listing of the REITs (APPRAISER, RA and AUDITOR), the results achieved in the three variables are similar. In no case are they statistically significant, so we can conclude that these reputable agents are no related to the underpricing when the listing of REITs on the market (hypothesis H2.d). These results are similar to those obtained by Dimovski et al. (2017), but not in the case of Bairagi & Dimovski (2011).

As far as the proportion of shares held by executives (EXECUTIVES) is concerned, the variable is significant in the different models. The negative sign indicates that the greater the proportion of shares held by executives is, the greater the value/quality they are assigning to the company (signalling tool) and the lower the underpricing (H3) will be. This result is robust to the different specifications analysed.

The following group of hypotheses (H4.a, H4.b and H4.c) refers to the influence of the stock market and industry conditions prior to the listing. The results

obtained are dissimilar in the different variables. In the case of IGBMRET they are robust to different specifications, and the positive coefficient and the significance of this variable lead us to conclude that the stock market conditions prior to the listing influences the level of underpricing. Thus, in bullish markets the level of underpricing is higher than in bearish markets. Our results differ from those obtained in the studies by Dimovski et al. (2017), Dolvin & Pyles (2009), Gokkaya et al. (2015) and Wong & Ong (2013), in which the variable that measures the stock market climate prior to listing is not significant. The INDUSTRY variable, although positive, is not significant, as occurs in the study by Dimovski & Brooks (2006a) but is the opposite to Dimovski & Brooks (2006b), where the sentiment of the real estate sector prior to the listing is positively and significantly related to underpricing. Finally, the variable MARKET is not statistically significant, so it cannot be confirmed that underpricing increases (decreases) in *hot (cold)* market phases (H4.b), as in the cases of Ascherl & Schaefers (2018) and Brobert (2016).

The last variables analysed are more related to the specific characteristics of REITs and the peculiarities of the market in which they are listed. In line with the results obtained by Ascherl & Schaefers (2018), Brobert (2016), Brounen & Eichholtz (2002) and Gokkaya et al. (2015),[13] the DIVERSI variable is positively related to underpricing, i.e. there is greater underpricing when the investment strategy is diversified. However, as in the studies mentioned above, it is not statistically significant.

Chen & Lu (2006) conclude that internally managed REITs are more underpriced. In our case, the sign of the MANAGEMENT variable shows us that internal management is negatively related to underpricing, in addition to the fact that this variable is not significant.

Finally, the VALPRICE variable yields a positive and statistically significant result for the different specifications. The fact that the members of the board of directors set a reference price for the start of trading equal to or below the equilibrium price determined by the appraiser (H7) has a positive influence on the level of underpricing. Although this is a more specific variable of the peculiarities of the market analysed, there are studies in this same line such as Ooi, Mori & Wong (2018) that find a positive and significant relationship (at 10%) of the variable that relates the placement price and the valuation with the level of underpricing.

8. Conclusions

The increase in the number of REITs listed on the stock market in Europe in recent years has stimulated the study of underpricing in these markets. In the case of Spain, the number of REITs has grown exponentially since they first entered the market in 2013. Currently, compared to Europe, Spanish REITs rank fourth in terms of market capitalisation with 12.38% and first in terms of the number of REITs (EPRA, 2018b).

This study analyses the phenomenon of underpricing in a sample of 41 REITs on the Spanish market between November 2013 and January 2019. The sample was obtained from the Spanish Multilateral Trading Facility known as the *Mercado Alternativo Bursátil* (MAB). Although admissions to this market did not take place by means of Initial Public Offerings of shares, but instead were carried out through direct listing, the results obtained show that underpricing does exist. The raw mean initial-day return is statistically significant with a value of 1.58% (1.44% and 1.41% adjusted for the Madrid Stock Exchange General Index and the FTSE EPRA/NAREIT Spain, respectively). When we break down the initial-day return we find that the reference-to-open return (primary market return) captures most of the result (1.37%), while the open-to-close return (secondary market return) is 0.27%, both figures being significant. This mean initial underpricing is maintained if we split the sample into REITs that have performed previous private placement (2.21%) and those that have not (1.31%), and although it is greater in the first case, the difference between the two is only significant at 10% using the bootstrap methodology.

However, despite the fact that the main price adjustment occurs at the first moment of trading (first fixing), with the original shareholders and/or those who took part in the previous private placement being the ones who were rewarded, we have found that the underpricing extends beyond the first trading session, since the raw and market-adjusted returns on the days following the listing are positive and significant until the third day of trading. Thus, the buy-and-hold return for the third trading day is 2.58% (2.63% and 2.45% adjusted for IGBM and FTSE EPRA/NAREIT Spain, respectively).

Finally, after testing a series of hypotheses based on different theories in the literature, our results suggest that, with the caution that should be taken when the sample is small, there is no relation between the *ex ante* uncertainty about the value of the company and the REIT underpricing. However, within the signalling theories, we observe that the proportion of shares retained by shareholders holding executive positions, a signalling tool related to ownership structure, is a key factor in determining

the level of underpricing. On the other hand, we have found that our results suggest that it is the general pre-listing stock market conditions that are related to underpricing rather than the industry-specific performance. To conclude, one of the main findings of this research is the fact that one of the differentiating characteristics of the market analysed (that is, the fact that the members of the board of directors of the REIT determine the reference price for the start of trading based on the equilibrium price established by the appraiser) is particularly relevant to determine the level of underpricing.

In sum, this research makes three main contributions. Firstly, it provides national and international investors and analysts with added value in their analysis of investment opportunities across a relevant and growing sector like the Spanish real estate and across a booming vehicle such as REITs. Secondly, it provides REIT issuers with new tools when deciding on the possible pricing when going public, the REIT shareholding structure and the most suitable time to enter the market. Lastly, it allows the regulator to see how these investment vehicles perform from another perspective for the sake of possible future regulatory modifications. One of the future lines of research that we consider interesting is the analysis of the long-term evolution of the performance of REITs in the Spanish market, as well as the identification of the main characteristics that influence it.

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Table 1. REIT markets around the world.

Country/region	Number of REITs	No. REITs/ Total No. REITs (%)	Capitalisation (million USD)	Capitalisation/ Total capitalisation (%)
America	277	33.74%	1,061.54	65.81%
United States	195	23.75%	996.94	61.81%
Asia - Pacific	259	31.55%	329.43	20.42%
Australia	46	5.60%	83.98	5.21%
EMEA	285	34.71%	221.95	13.76%
Europe [a]	219	26.67%	194.49	12.06%
MEA [b]	66	8.04%	27.46	1.70%
Total Global Markets	821	100.00%	1,612.92	100.00%

Notes:
Figures at 31 December 2018.
[a] Includes Europe Union and Russian Federation.
[b] Includes Israel, South Africa, Turkey and United Arab Emirates.
Source:
Own elaboration based on EPRA (2018b).

Table 2. REIT markets in Europe.

Country	Number of REITs	No. REITs/ Total No. REITs (%)	Capitalisation (million USD)	Capitalisation/ Total capitalisation (%)
United Kingdom	57	26.03%	67.35	34.63%
France	27	12.33%	50.52	25.98%
Netherlands	5	2.28%	25.64	13.18%
Spain	**63**	**28.77%**	**24.07**	**12.38%**
Belgium	17	7.76%	15	7.71%
Germany	6	2.74%	4.07	2.09%
Ireland	4	1.83%	2.84	1.46%
Greece	5	2.28%	2.52	1.30%
Italy	2	0.91%	0.97	0.50%
Bulgaria	29	13.24%	0.73	0.38%
Poland	3	1.37%	0.64	0.33%
Russian Federation	1	0.46%	0.14	0.07%
Total Europe	219	100.00%	194.49	100.00%

Note:
Figures at 31 December 2018.
Source:
Own elaboration based on EPRA (2018b).

Table 3. Main requirements for the admission and trading of REITs in the MAB.

ADMISSION	
Minimum share capital	There is no minimum.
Previous placement	Initial Public Offering (IPO), Secondary Offering or direct listing.
Free Float	It shall be necessary for shareholders to hold <5% of the share capital, i.e. a number of shares that corresponds to at least either i) an estimated market value of €2 million, or ii) 25% of the shares issued by the company.
Initial informative documentation	Informational Document on Admission to the Market (IDAM with detailed information about the company, its business and perspectives. Historical financial information: for the last 3 years with the audit report for each year. Companies that do not have 24 consecutive months of audited information must present forecasts for the current year and the following year.
Lock-up	The main shareholders, directors and executives shall commit to not selling shares during the year following the admission of the company, except for sale offer (public or not).
Other agents	Appointment of Registered Advisor (RA) and Liquidity Provider.
TRADING	
Trading type	Electronic, via the SIBE-SMART.
Trading System	Single-price setting or fixing (multilateral trading) and block trading (bilateral trading).

Source:
Own elaboration based on Bolsas y Mercados Españoles (2016, 2017, 2018a).

Table 4. Summary of initial-day returns (IR) of REITs or property firms from selected studies.

	Country	Sample size and type	Sample period	Mean IR (%)
Global				
Chan et al. (2013)	Global	370 REITs	1996-2010	3.24**
Brobert (2016) [a]	Global	445 REITs	1996-2014	3.94***
North America				
Wang et al. (1992)	US	87 REITs	1971-1988	-2.82***
Ling & Ryngaert (1997)	US	85 REITs	1991-1994	3.60*
Londerville (2002)	Canada	13 REITs	1993-1998	1.71
Buttimer et al. (2005)	US	163 REITs	1980-2001	2.47***
Hartzell, Kallberg, & Liu (2005)	US	189 REITs	1980-1998	0.27
Chen & Lu (2006)	US	197 REITs	1980-1999	2.9 (NA)
Dolvin & Pyles (2009)	US	209 REITs	1986-2004	3.72 (NA)
Bairagi & Dimovski (2011)	US	123 REITs	1996-2010	3.18***
Gokkaya et al. (2015)	US	126 REITs	1993-2005	5.23***
Dimovski et al. (2017)	US	56 REITs	2010-2015	0.10
Asia-Pacific				
Dimovski & Brooks (2006a)	Australia	58 REITs	1994-2004	2.6 (SIG)
Dimovski & Brooks (2006b)	Australia	37 REITs	1994-1999	1.20
Dimovski (2010)	Australia	45 REITs	2002-2008	3.37 (SIG)
Kutsuna, Dimovski, & Brooks (2008)	Japan	40 REITs	2001-2006	0.50
Ooi (2009)	Singapore	20 REITs	2002-2007	11.82***
Wong & Ong (2013)	Japan, Hong Kong, Singapore & Malaysia	78 REITs	2001-2008	3.10**

	Country	Sample size and type	Sample period	Mean IR (%)
Dimovski (2016)	Australia	22 PROP 92 REITs	1994-2014	13.75 (NA) PROP 2.11 (NA) REIT
Ooi, Mori, & Wong (2018)	Japan, Hong Kong, Singapore & Malaysia	107 REITs	2001-2013	3.08***
Europa				
Brounen & Eichholtz (2001)	Europe	83 PROP	1990-2000	3.43 (SIG)
Brounen & Eichholtz (2002)	UK, France, Switzerland	54 PROP	1984-1999	2.55**
Freybote et al. (2008)	Europe	105 PROP	1994-2006	7.26 ***
Brämisch, Rottke, & Schiereck (2011)	Europe	120 PROP	1997-2007	6.00 (NA)
Ascherl & Schaefers (2018)[b]	Europe	78 PROP 29 REITs	2000-2016	5.69 *** PROP 2.02 *** REIT

Notes:
PROP: property firms or *Real Estate Operating Company* (REOC).
NA: significance not given.
SIG: significance with no indication at what level.
[a] The sample includes 2 REITs from the Spanish market with a non-significant underpricing of 0.25%.
[b] The sample includes 3 REITs from the Spanish market with a non-significant underpricing of -1.00%.
***, **, * significant at the 1%, 5% and 10% levels, respectively.

Table 5. Definition of the explanatory variables selected to test the hypotheses of REIT underpricing.

SIZE	Market capitalisation on listing day (number of shares by reference price), in millions of euros.
DEBT	Total debt to total assets ratio (both from the latest annual audited accounts or interim financial information subject to a limited review by its auditor, published in the IDAM).
AGE	Age of the issuing company from the constitution date to the listing day.
APPRAISER	Ranking of the appraiser based on the number of listings in which the agent has participated.
RA	Ranking of the Registered Advisor based on the number of listings in which the agent has participated.
AUDITOR	Ranking of the auditor based on the number of listings in which the agent has participated.
EXECUTIVES	Percentage of shares, directly and indirectly, retained by shareholders in executive positions according to IDAM information.
IGBMRET	Buy-and-hold return of the IGBM computed 30 days prior to the listing.
MARKET	Dummy variable equal to one if there have been ten or more flotations in the year the REIT was listed (hot market), and zero (cold market) otherwise.
INDUSTRY	Change (in percentage) of the rental income in Spain in the quarter prior to the listing (data obtained from the real estate portal "idealista.com").
DIVERSI	Dummy variable equal to one if the property strategy followed by the REIT is diversified and zero if the property strategy followed by the REIT is specialised. Following Brounen & Eichholtz (2002), REITs having more than 80% of their total assets in one property type are regarded as specialised.
MANAGEMENT	Dummy variable equal to one if the management of the company is internal and zero if the management is external.
VALPRICE	Dummy variable equal to one if the reference price determined by the board of directors of the REIT is equal to or less than the equilibrium price determined by the appraiser and zero otherwise.

Table 6. Summary statistics for the explanatory variables employed in the OLS regression models.

	N	Mean	Std. dev.	Min.	Median	Max.
SIZE (million €)	41	167.07	314.85	5.91	65.78	**1,838.56**
DEBT (%)	41	32.30	22.90	0.00	37.10	77.90
AGE (years)	41	4.85	7.90	0.19	2.17	**42.27**
APPRAISER	36	0.678	0.331	0.11	0.78	1.00
RA	41	0.653	0.393	0.05	1.00	1.00
AUDITOR	41	0.603	0.375	0.06	0.63	1.00
EXECUTIVES (%)	41	22.89	30.89	0.00	5.10	98.72
IGBMRET (%)	41	-2.40	5.60	-15.40	-1.40	6.00
INDUSTRY (%)	41	2.00	1.60	-1.00	2.00	5.20
Dummy variables		*Dummy* 0			*Dummy* 1	
MARKET	41	12			29	
DIVERSI	41	29			12	
MANAGEMENT	41	33			8	
VALPRICE	36	15			21	

Notes:
The variables are described in Table 5.
Figures in bold are outliers.[14]

Table 7. Raw and market-adjusted initial-day return for the full sample.

	IR	AR IGBM	AR EPRA
Mean	*** 1.58 [a]	*** 1.44 [a]	*** 1.41 [a]
Median	1.00 [a]	0.77 [a]	1.33 [a]
Maximum	7.69	8.22	5.80
Minimum	0.00	-3.76	-2.58
Standard deviation	1.83	2.42	1.92
Sample size (N)	41	41	41

Notes:
Data in % except sample size.
IR: raw initial-day return.
AR IGBM: initial-day return adjusted with the Madrid Stock Exchange General Index (IGBM).
AR EPRA: initial-day return adjusted with the FTSE EPRA/NAREIT Spain index.
[a, b, c] significant at the 1%, 5% and 10% levels, respectively.
***, **, * significant at the 1%, 5% and 10% levels, respectively, using the bootstrap methodology.

Table 8. Raw initial-day return and primary and secondary market return for the full sample.

Panel A. Statistics	IR	PR	SR
Mean	*** 1.58 [a]	*** 1.31 [a]	* 0.27
Median	1.00 [a]	0.95 [a]	0.00
Maximum	7.69	5.00	4.50
Minimum	0.00	0.00	-2.44
Standard deviation	1.83	1.32	1.15
Positive over total cases	68.29	73.17	36.59
Number of cases with zero return	13	11	26
Sample size (N)	41	41	41
Panel B. Test of differences	IR – PR	PR – SR	IR - SR
Mean differences	0.27	*** 1.06 [a]	*** 1.31 [a]
Median differences	0.05	0.95 [a]	1.00 [a]

Notes:
Data in % except sample size and number of cases with zero returns.
PR: primary market return.
SR: secondary market return.
[a, b, c] significant at the 1%, 5% and 10% levels, respectively.
***, **, * significant at the 1%, 5% and 10% levels, respectively, using the bootstrap methodology.

Table 9. Raw and market-adjusted initial-day return and raw returns tests. Segmentation of the sample according to whether or not there was a previous private placement.

Panel A: Returns and statistics	Previous private placement sample (PPP)	Non-previous private placement sample (non-PPP)
Raw initial-day return (IR)		
Mean	*** 2.21 [a]	*** 1.31 [a]
Median	1.83 [a]	0.95 [a]
Maximum	5.83	7.69
Minimum	0.00	0.00
Standard deviation	1.90	1.77
IGBM market-adjusted initial-day return (AR IGBM)		
Mean	*** 2.37 [a]	** 1.07 [b]
Median	2.12 [a]	0.72 b
Maximum	6.47	8.22
Minimum	-0.06	-3.76
Standard deviation	2.09	2.48
EPRA market-adjusted initial-day return (AR EPRA)		
Mean	*** 2.04 [a]	*** 1.14 [a]
Median	2.15 [a]	1.18 [a]
Maximum	5.51	5.80
Minimum	-0.72	-0.26
Standard deviation	1.76	1.94
Sample size (N)	12	29

Panel B. Raw-return tests	PPP – non-PPP
Mean differences	* 0.91
Median differences	0.88

Notes:
Data in % except sample size.
[a, b, c] significant at the 1%, 5% and 10% levels, respectively.
***, **, * significant at the 1%, 5% and 10% levels, respectively, using the bootstrap methodology.

Table 10. Raw initial-day return and primary and secondary market returns. Segmentation of the sample according to whether or not there was a previous private placement.

Panel A. Returns	IR	PR	SR
Previous private placement (PPP)			
Mean	*** 2.21 [a]	*** 1.60 [a]	0.61
Median	1.83 [a]	0.93 [a]	0.00 [c]
Maximum	5.83	5.00	4.50
Minimum	0.00	0.00	-0.82
Standard deviation	1.90	1.63	1.13
Positive over total cases	83.33	75.00	50.00
Number of cases with zero return	2	3	6
Sample size (N)	12	12	12
Non-previous private placement (non-PPP)			
Mean	*** 1.31 [a]	*** 1.19 [a]	0.12
Median	0.95 [a]	0.95 [a]	0.00
Maximum	7.69	4.80	2.75
Minimum	0	0.00	-2.43
Standard deviation	1.77	1.18	1.05
Positive over total cases	62.07	72.41	31.03
Number of cases with zero return	11	8	20
Sample size (N)	29	29	29

Panel B. Contrast	IR - PR	PR - SR	IR - SR
Previous private placement (PPP)			
Mean differences	0.61	0.99	** 1.61 [b]
Median differences	0.90	0.93 [c]	1.83 [b]
Non-previous private placement (non-PPP)			
Mean differences	0.12	*** 1.07 [a]	*** 1.19 [a]
Median differences	0.00	0.95 [a]	0.95 [a]

Notes:
Data in % except sample size and number of cases with zero returns.
[a, b, c] significant at the 1%, 5% and 10% levels, respectively.
***, **, * significant at the 1%, 5% and 10% levels, respectively, using the bootstrap methodology.

Table 11. Raw and market-adjusted returns for the first five trading days. Raw (BHR) and market-adjusted (BHAR) buy-and-hold returns. Final full sample.

	Sample size (N)	IR_t	AR_t IGBM	AR_t EPRA	$BHR\tau$	$BHAR\tau$ IGBM	$BHAR\tau$ EPRA
Day 1	41	*** 1.58 [a] (1.00) [a]	*** 1.44 [a] (0.77) [a]	*** 1.41 [a] (1.33) [a]			
Day 2	41	*** 0.60 [a] (0.00) [a]	*** 0.74 [a] (0.30) [b]	** 0.25 [b] (0.24) [b]	*** 2.20 [a] (1.43) [a]	*** 2.20 [a] (1.39) [a]	*** 1.97 [a] (1.25) [a]
Day 3	41	** 0.36 [b] (0.00) [b]	* 0.41 [c] (0.21)	** 0.42 [c] (0.16) [c]	** 2.58 [a] (1.52) [a]	*** 2.63 [a] (1.79) [a]	*** 2.45 [a] (1.74) [a]
Day 4	41	* 0.41 [c] (0.00) [b]	0.17 (0.13)	0.26 (0.00)	*** 3.01 [a] (1.52) [a]	*** 2.86 [a] (1.90) [a]	*** 2.50 [a] (1.40) [b]
Day 5	41	0.17 (0.00)	0.23 (0.01)	0.27 (0.00)	*** 3.20 [a] (1.52) [a]	*** 3.11 [a] (1.83) [a]	*** 2.93 [a] (2.15) [a]

Notes:
Data in % except sample size.
The median is reported between brackets.
BHR: buy-and-hold return.
BHAR IGBM: buy-and-hold return adjusted with IGBM.
BHAR EPRA: buy-and-hold return adjusted with FTSE EPRA/NAREIT Spain index.
[a, b, c] significant at the 1%, 5% and 10% levels, respectively.
***, **, * significant at the 1%, 5% and 10% levels, respectively, using the bootstrap methodology.

Table 12. Results of OLS regression models of factors explaining REITs underpricing.

	M1	M2	M3	M4	M5	M6	M7	M8
Intercept	***0.044[a]	***0.034[a]	**0.036[a]	** 0.037[a]	***0.040[a]	**0.048[a]	***0.046[a]	***0.044[a]
LNSIZE		0.001						
LNDEBT	*-0.063[c]	-0.042	*-0.068[c]	**-0.070[b]	**-0.072[b]	-0.035	*-0.063[c]	*-0.066[c]
LNAGE		*-0.012[c]				-0.012		
APPRAISER				0.003				0.015
RA								-0.026
AUDITOR						-0.017		
EXECUTIVES	**-0.001[b]		**-0.001[b]	**-0.001[b]	*-0.001[b]		**-0.001[b]	***0.000[c]
IGBMRET	***0.214[a]	**0.283[b]	**0.193[a]	***0.216[a]	***0.238[a]	***0.290[b]	***0.218[a]	***0.196[a]
MARKET							-0.003	
SECTOR		0.370	0.264	0.269	0.311	0.380		0.347
DIVERSI			0.017					
MANAGEMENT					-0.012	-0.006		
VALPRICE	**0.018[b]	**0.019[b]	**0.019[a]	***0.021[a]	***0.023[a]	**0.018[b]	**0.018[b]	**0.024[a]
N	36	36	36	36	36	36	36	36
R^2	22.10%	25.51%	29.50%	24.50%	26.38%	28.87%	22.28%	30.46%
Adjusted R^2	12.10%	10.09%	14.89%	12.84%	11.14%	11.09%	9.32%	13.08%
F-test statistic	4.38[a]	2.94[b]	2.95[b]	3.73[a]	4.32[a]	2.00[c]	5.17[b]	3.15[b]
VIF	[1.09-1.33]	[1.14-1.48]	[1.09-1.40]	[1.19-1.40]	[1.09-1.38]	[1.14-2.43]	[1.07-1.33]	[1.21-1.57]

Notes:
Multiple linear regression models estimated by cross-sectional Ordinary Least Squares (OLS). Dependent variable is the buy-and-hold return until trading day 3. Heteroscedasticity has been corrected using White's methodology.
The variables are described in Table 5.
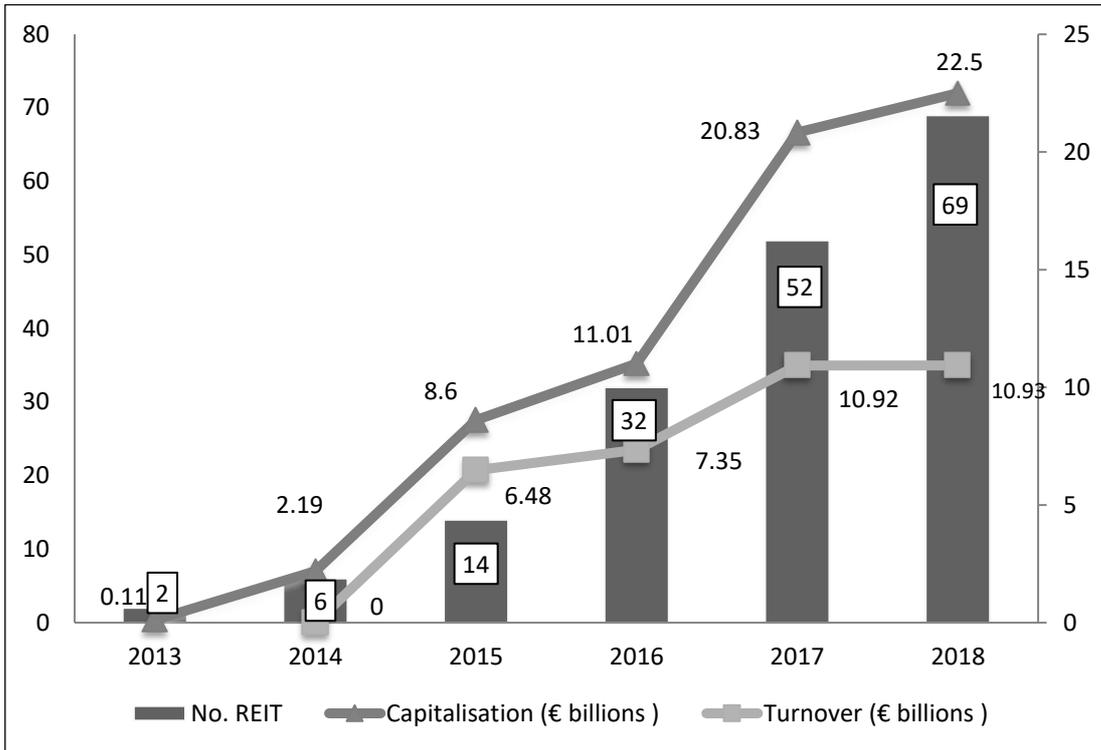R^2: determination coefficient.
Adjusted R^2: adjusted determination coefficient.
VIF: Variance Inflation Factor. Maximum-minimum values are reported.
[a, b, c] significant at the 1%, 5% and 10% levels, respectively. The *t*-statistic is reported in square brackets.
***, **, * significant at the 1%, 5% and 10% levels, respectively, using the bootstrap methodology.

Graphs

Graph 1. Time profile of REITs in the Spanish stock market during the period 2013-2018.
Source:
Own elaboration based on Bolsas y Mercados Españoles (2018b, 2018c).

Appendices

Appendix 1. Ranking of the specialist agents involved in MAB listings.

For each of the specialist agents defined (appraiser, Registered Advisor and auditor), we have developed our own ranking following the methodology developed by Migliorati & Vismara (2014): the classification according to the number of listings in which each agent participates.

In each ranking, the specialist agent with the greatest number of listings is assigned rank 1, the rank of the other agents being established as a proportion of this maximum.

Company appraisers ranking		
Institution	No. listing	Ranking
CBRE Valuation Advisory, S.A.	9	1.00
Gesvalt Sociedad de Tasación, S.A.	8	0.89
Ernst & Young Servicios Corporativos, S.L.	7	0.78
Aguirre Newman Madrid, S.A.U.	3	0.33
Grant Thornton Advisory, S.L.P.	3	0.33
Instituto de Análisis Inmobiliario, S.L.	2	0.22
Deloitte Financial Advisory, S.L.	1	0.11
Knight Frank España, S.A.U.	1	0.11
TINSA Tasaciones Inmobiliarias, S.A.U.	1	0.11
Colliers International S.L.	1	0.11

Registered Advisors ranking		
Institution	No. listing	Ranking
RENTA 4 Corporate, S.A.	22	1.00
ARMABEX, Asesores Registrados, S.L.	9	0.41
VGM Advisory Partners, S.L.U.	4	0.18
Deloitte, S.L.	2	0.09
PKF Attest Servicios Empresariales, S.L.	1	0.05
Solventis A.V., S.A.	1	0.05
ARCANO Valores, A.V., S.A.	1	0.05
GVC Gaesco Beka, S.V., S.A.	1	0.05

Auditors ranking		
Institution	No. listing	Ranking
PricewaterhouseCoopers Auditores, S.L.	16	1.00
Deloitte Auditores, S.L.	10	0.63
Ernst and Young, S.L.	5	0.31
Gimeno Auditores, S.L.P.	2	0.13
Auren Auditores SP, S.L.P.	2	0.13
SCD Auditoría, S.L.P.	1	0.06
BDO Auditores, S.L.	1	0.06
Capital Auditors and Consultants, S.L.	1	0.06
KPMG Auditores, S.L.	1	0.06
CAUDISA MGC Compañía de Auditores, S.L.P.	1	0.06
Grant Thornton, S.L.P.	1	0.06

Appendix 2. Correlation matrix computed with the Spearman Rho for the explanatory variables used in the regression models.

	LNSIZE	LNDEBT	EXECUTIVES	IGBMRET	RA	APPRAISER	AUDITOR	LNAGE	MARKET	DIVERSI	MANAGEMENT	VALPRICE	INDUSTRY
LNSIZE	1												
LNDEBT	0.2916 [c]	1											
EXECUTIVES	-0.4508 [a]	-0.2827 [c]	1										
IGBMRET	0.1949	-0.0376	0.0892	1									
RA	0.4310 [a]	0.4558 [a]	-0.2693 [c]	-0.3428 [b]	1								
APPRAISER	0.1365	0.1124	-0.1825	-0.0402	0.3923 [b]	1							
AUDITOR	0.0994	0.0974	-0.4340 [a]	0.0090	-0.0239	0.1351	1						
LNAGE	0.2047	0.3485 [b]	0.2112	0.1542	0.2743 [c]	-0.0394	-0.3217 [b]	1					
MARKET	0.1177	0.0817	-0.1633	0.0317	0.0372	0.2100	-0.0283	-0.0181	1				
DIVERSI	-0.1964	0.043	0.3789 [b]	0.1333	-0.0776	-0.2189	-0.5091 [a]	0.2012	0.0031	1			
MANAGEMENT	0.0780	-0.015	0.3560 [b]	0.1222	0.0968	-0.0262	-0.3577 [b]	0.4473 [a]	-0.0890	0.2519	1		
VALPRICE	0.1383	0.1003	0.0283	-0.1600	0.2058	0.0110	-0.1634	-0.0894	-0.0713	0.0713	0.1807	1	
INDUSTRY	0.0794	-0.0494	-0.0466	0.0310	0.0519	0.2798 [c]	0.0192	0.1194	0.4319 [a]	-0.0170	-0.0522	-0.2150	1

Notes:
The sample size is of 41, except in APPRAISER and VALPRICE which is 36.
[a, b, c] significant at the 1%, 5% and 10% levels, respectively.

Notes

1. Some differential characteristics of REITs are that they invest in tangible assets which can be rented so as to generate income, they have specific organisational structures and shareholder limitations, and they are required to distribute dividends, among others. See (Stevenson, 2013) for a detailed discussion.
2. The MAB has been selected because it is the Spanish stock market on which the highest number of REITs are listed. The five REITs of the Spanish *Mercado Continuo* (which is a regulated market) have not been included in the sample so that the results are not distorted by differences in the characteristics and regulation of this market and the MAB.
3. The Spanish market has been included in the analysis of multi-country underpricing studies but in a very residual manner, as shown in Section 3.
4. The main modifications included in Spanish Law 16/2012 were, among others, the introduction of requirements for a more lax quotation, the reduction of the number of properties per REIT from three to one, the reduction of the minimum property holding period from 7 to 3 years, the reduction of the minimum share capital from 15 to 5 million euros, or the elimination of the maximum debt percentage of 70% (Taltavull de La Paz & Cuenca, 2013).
5. As of 31 January 2019 there are two Spanish REITs listed on the Euronext Access.
6. Shares are auctioned throughout the session (from 8.30 am to 4.00 pm) with two price fixing and stock allotment times, at 12 noon and 4 pm. The price resulting from the second auction is the closing price of the session (provided that at least 200 shares are traded).
7. Article 35 of Royal Legislative Decree 4/2015, of 23 October, approving the consolidated text of the Spanish Securities Market Act, includes the definition of an initial public offering and secondary offerings.
8. The end of the period was taken to be 31 January 2019 instead of the end of the financial year (31 December 2018) as, historically, most listings take place during the periods June-July and December-January.
9. From the calculated mean and standard deviation of the initial-day return (IR_i), extreme values have been considered as being those that exceed three times the standard deviation of the target variable.
10. The hypotheses put forward have also been tested for the initial-day return, both raw and adjusted $(IR_i, IR_i IGBM, IR_i EPRA)$. The results can be obtained from the authors on request.
11. From the mean and the standard deviation of the buy-and-hold return of the third day that was calculated, extreme values have been considered as those that exceed three times the standard deviation of the target variable.
12. In the defined models there is no pair of variables with a correlation greater than 38%, with the exception of model 8, in which the variables RA and DEBT have a correlation of 45%. However, given their null economic relationship, it has been considered correct to include them in the same model.
13. In the case of Gokkaya et al. (2015) the variable that measures diversification in investment is significant at 10%.
14. From the mean and the standard deviation of the variable analysed, extreme values have been considered as those that exceed three times the standard deviation of the target variable.