Abnormal Returns in Privatization Public Offerings: The Case of Portuguese Firms

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Summary

This paper provides evidence on abnormal returns of Portuguese privatization public offerings for the period from 1989 to 2001. Previous empirical studies report the existence of underpricing for privatized firms in the short-run and positive abnormal returns in the long run. This study explores the abnormal performance of a comprehensive sample of Portuguese privatization transactions and investigates the determinants of the observed price behavior. Our results are not supportive of the underpricing phenomenon except if we exclude the very extreme observations. The results show further that privatization IPOs underperform private sector IPOs. In the long run, we observe negative abnormal returns. While in early event months, privatization public offerings yield more negative returns than private sector offerings, this effect is reversed in longer horizon periods. Initial underpricing is thus reversed and investors seem to require higher returns in partial privatizations.

Keywords: Privatization, IPOs

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1. Introduction

A considerable high number of studies documents the phenomenon of underpricing of privatized firms in the short run and positive abnormal performance in the long run. This study measures short and long term abnormal returns to investors in Portuguese privatization public offerings and investigates the determinants of the observed price behavior. The empirical analysis is based on a comprehensive sample of privatization transactions that took place on the Portuguese stock exchange for the period from 1989 to 2001.

Documenting and understanding the short and long term market performance of privatization public offerings in different countries can shed light on the debate upon the impact

of privatization programs on firm's value, and on whether the performance is tied to particular characteristics of a privatization program (aims, strategies and methods). The contribution of this paper is to extend the analysis of the literature on privatization public offerings providing additional evidence regarding a single country program. Previous empirical studies are mainly multinational studies that analyze transactions across markets or, in the case of country studies, that refer mostly to "voucher" privatization programs of economies in transition (countries from Central and Eastern Europe).

Our paper tests several theoretical predictions that have been put forward in the literature. In particular we investigate the role of political strategies and dual listing in the short and long run performance of privatization public offerings.

Our results are not supportive of the underpricing phenomenon except when we exclude the very extreme observations. Our results show further that privatization IPOs underperform private sector IPOs. These results contradict most of the previous evidence[1]. The degree of underpricing seems to reflect uncertainty and not a strategic policy to gain power.

In the long run, we observe negative abnormal returns contradicting the most recent evidence[2]. While in early event months, privatization public offerings yield more negative returns than private sector offerings, this effect is reversed in longer horizon periods[3]. Initial underpricing is thus reversed and, investors seem to require higher returns in partial privatizations.

The paper is organized as follows. Section 2 provides a brief overview of the Portuguese privatization program. Section 3 describes the sample. In Sections 4 and 5 we review the relevant literature, describe the tests and variables and present the results for, respectively, the short and long-run market performance. Section 6 concludes.

2. The Portuguese Privatization Program

The Portuguese privatization program started in 1989, well after the privatization wave in European developed countries initiated by the British Margaret Thatchers's government back in the early 1980's. The late launch of the program was due to the political and legal environment

[1] See, for example, Choi and Nam (1998) that look at 185 PIPOs from 30 countries over the period from 1981 to 1997. Yet some studies on Central and Eastern European privatization offerings also find that the difference in initial returns between IPOs and Private IPOs is insignificant.

[2] Megginson, Nash, Netter and Schwartz (2000) find positive and statistically positive long-run (1-5 years) returns for a sample of 158 PIPOs from 33 countries from 1981 to 1997.

[3] This result is consistent with recent empirical literature, employing state of art techniques, that finds PIPOs outperform private IPOs.

created by the 1974 Revolution and the massive process of nationalizations that followed.[4] Only in 1998 as a part of a broad set of economic reforms, the transfer of state holdings to private sector began. Initially only sales of minority shareholding positions were allowed but that was changed in 1990, when the Law of Privatization was approved. The main stated objectives of the privatization program therein, were similar to those elected in most countries. Besides the reduction of state ownership in itself, the program aimed at raising cash to reduce public debt and budget deficits; improving economic efficiency through the use of markets to allocate resources; submitting companies to transparent corporate governance rules, developing domestic capital markets; and disseminating share ownership[5].

The privatization methods used by the Portuguese government changed over time but the preferred method was sales through Public Offerings held in the Portuguese stock exchange. The method of Direct Sales was used, exceptionally, for small companies and supposedly when national political and economic interests were at stake.[6]

Table 1 shows the annual proceeds of the privatization public offerings over the period from 1989 to 2001. Sales were spread over time but 1992, 1997 and 1998 were important years with sales amounting to respectively, 1 300, 2 000 and 2 200 million euros. Total capital raised amounted to 8,8 thousand million euros in 66 transactions. There was a predominance of partial privatizations and over time, there were important differences in the transactions, in particular regarding the industries of the privatized firms.[7] By 2001, privatized firms accounted for more than 50% of total market capitalization.

3. Sample

We have identified the transactions in Dathis, a financial database compiled by the Portuguese stock exchange and that is the most comprehensive data set on Portuguese stocks. We have collected data on offer size, initial offer prices, offer dates and quotes.

Table 2 shows the transactions in sample. The sample includes 42 privatization transactions, of which 19 are initial offers (Privatization Initial Public Offers - PIPOs) and 23 are secondary (seasoned) offers (Privatization Seasoned Public Offers - PSPOs). Inevitably PSPOs are more common in later years and, after 1998, the Portuguese government only launched

[4] The nationalization process in Portugal started in 1975 and was extensive to all sectors in the economy: banks, insurance companies, oil, transports, energy, telecommunications, pulp and paper, beverages, etc.
[5] By the end of 1988, the Portuguese stock market was short-lived (the stock exchange re-opened effectively in 1986), illiquid and tiny. Aggregate market capitalization was then below 4 000 million euros. By the end of 2001, aggregate market capitalization was above 50 million euros (down from 66 million euros by the end of 1999).
[6] This was the case of GALP, the Portuguese oil refinery and distribution company.
[7] The initial transactions involved banks, insurance companies and brewers.

subsequent offers. The proceeds of the 42 privatization transactions in sample represent 96% of the total proceeds of all privatization public offers in Portugal for the period analyzed. The remaining transactions refer to sales of small firms that were sold on the stock exchange but were not listed on the main regular market[8].

As documented in other privatization studies (see, for example, Jelic and Briston, 2003), the effective open market trading of the shares of privatized firms after the official IPO date is often a long process and there is a substantial variance in time to listing across firms. This delay results from the design of the operation, in particular legal constraints on trading[9]. For the PIPOs in sample, the median time to listing was 43 days.

Table 3 describes the transactions for Portuguese private sector IPOs. The sample comprises 15 IPOs and represents the universe of private sector transactions in the sample period. PIPOS are on average much larger than private IPOs (10 times larger) and this is similar to what has been reported in previous studies. The median time to listing for these offerings was 3 days.

4. Short-Run Market Performance

4.1. Theoretical Predictions and Previous Findings

Previous evidence has shown that companies underprice their shares when they go public. The underpricing has been also documented for PIPOs, in different countries and over different time periods. The evidence of single country studies, in particular referring to Central and Eastern European countries, is sometimes conflicting. Yet more recent studies that studies with comprehensive samples of operations across countries, show overwhelming evidence of positive significant initial returns in PIPOs and larger than in other IPOs.[10] Seasoned offerings are underpriced as well, though much less so than PIPOs.

Different theoretical arguments have been put forward to account for the observed privatization initial returns.

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[8] There are three trading platforms in the Portuguese stock exchange. Regular firms, that meet all exchange requirements (in terms of capital dispersion, market capitalization and solvency), are listed on Mercado de Cotações Oficiais. Small and medium firms list on Segundo Mercado. The firms that do not meet the exchange requirements are listed on Mercado Sem Cotações.

[9] For example, in Portugal buying shares of privatized companies allowed tax allowances subject to a minimum required holding period. The same applies for special tranches reserved to employees, immigrants, small investors and even clients, that were placed at a discount relative to the offer price but again required a minimum holding period.

[10] Megginson and Netter (2001) survey article in the Journal of Economic Literature presents a number of studies examining initial returns in PIPOs that find positive significant initial performance. Yet several authors show contradictory results. See, for example, Dewenter and Malatesta (1997).

According to asymmetric information theories, and as described by Huang and Levich (2003), it is reasonable to expect that there should be less uncertainty about larger and mature firms, operating in stable industries, as they are likely to be followed by more analysts, produce more information about their activities, and possibly have longer periods of operation, than small and young firms established in new industries. If so, a larger underpricing should be observed for privatizations of smaller state-owned firms. Given that companies involved in private IPOs are younger and in more dynamic industries, privatization IPOs should be less underpriced and thus yield lower initial returns. Yet limited demand in small capital markets may dictate greater underpricing for larger issues to ensure the success of the operation. Therefore a higher degree of underpricing may be observed in larger privatization offerings. Asymmetric information theories also predict the underpricing is larger for transactions where the length of time between offer price setting and first trade date is greater, and for initial privatization offerings. As the scope and implications of the privatization program are revealed, uncertainty about offer characteristics is reduced yielding diminishing initial returns over time.

Political economic theories argue that governments pursue above all political objectives. This view argues, for example, that shares are allocated for purchase at a discount by firm employees to gain employee political support in the process. This suggests that, initial returns in privatizations for which a share tranche is reserved to employees, should exceed initial returns observed when there is no such reserved tranche. Similarly, governments try to build political support during the early stages of a privatization program by underpricing first privatization offers, which satisfies investors and increases their confidence for the next offers. Higher initial returns should also be expected whenever a privatization offer occurs on a year of parliamentary elections, before those elections take place, to avoid shifting voting preferences of the population. Finally, according to Biais and Perotti (2002), strategic privatization, by allocating significant share ownership to a targeted section of the population, is mainly used by right-wing parties. If so, higher initial returns should be observed when right-wing parties are leading the country.

As for foreign participation, it is plausible to assume that governments that are concerned with building domestic electoral support, bar foreigners from taking up any part of the offer. A privatization program represents a wealth transfer from the state to investors and, for a given level of underpricing, governments will be more subject to criticism the greater is the foreign allocation. The prediction is thus that higher initial returns should be observed in offers where there is no share tranche reserved to foreigners and should be lower when foreign allocation increases. Yet, international diversification benefits would dictate that offer prices are higher in

offerings with foreign international investors[11]. On top of that, the cross-listing of the shares of a privatized firm may be seen as a signal of quality and government's commitment through the privatization program. This could resolve part of the uncertainty regarding the firm value and result in higher offer prices in the first place and therefore lower underpricing for those offers with a listing in foreign markets.

Agency theory models argue that managerial incentives and market monitoring are ineffective in partial sales because the control shift to the private sector is not complete, given the likelihood of a government intervention later after the sale, and that impacts expected economic performance. This is also true for sales of firms in regulated industries. The prediction is that partial privatization offerings are riskier and therefore a larger underpricing is required to reassure and convince investors to buy shares. Yet a government mainly concerned with revenue maximization would be unwilling to underprice and would prefer total privatization.

Finally, the degree of underpricing depends on how the offer price was chosen. More and more offer prices are set after a process of book building, in order to gather information on the demand prices and orders. In such a setting, underpricing should be lower due to uncertainty resolution when such processes are used.

Evidence suggests that underpricing is more severe for state-owned firms in regulated industries, consistent with the agency arguments (see, for example, Dewenter and Malatesta, 1997). Yet there are conflicting results regarding the effect of partial privatization: several studies show returns are positively related to the stake sold (see, for example, Jones et al, 199 and Choi and Nam, 1998), suggesting governments choose above all to maximize revenues.

4.2 Methodology and Variables

We investigate if Portuguese privatization public offerings have positive initial returns. We use the traditional event-study methodology (see, for example, Dewenter and Malatesta, 1997) to measure privatization unadjusted and market-adjusted returns over one-day, seven-day and thirty-day holding periods following the offer date[12]. Raw returns are given by:

$$r_{it} = log\,(P_{i,t}) - log\,(P_{i,0}) \qquad (1)$$

where

r_{it}: raw, unadjusted return for stock i on day t;

$P_{i,t}$: closing price for stock i on day t following initial trade ($t = 1, 7, 30$);

[11] Higher offer prices due to an increase in demand (demand effect).

[12] For simplification, we use calendar day intervals and not trading days.

$P_{i,o}$: initial offer price for stock *i* (time index *0* refers to the issue date).

Abnormal returns are defined as market-adjusted returns:

$$r^*_{it} = r_{it} - r_{mt} \qquad (2)$$

where

r^*_{it}: market-adjusted return for company *i* on day *t*;

r_{mt}: market return on day *t,* defined as $log\ (I_t) - log\ (I_o)$

I_t: stock market index level on day *t*;

I_o: stock market index level on the date the offer price was set.

To ensure that results are robust, market-adjusted returns were computed with reference to two different indices. The indices used were PSI Geral (the reference index of Portuguese stocks) and S&P 500. Stock market indices data is from Datastream International.

The use of offer prices for the calculation of initial returns creates some problems. In particular, the time difference observed in the process of introducing shares into trading is, in some cases, very long and as such, abnormal returns should be interpreted with caution.

Significance is assessed on the basis of Student's t-test, on the assumption that returns are independently, identically and normally distributed. The t-statistic is given by[13]:

$$t = \frac{\sum_i r_i}{\sqrt{N} \cdot \hat{\sigma}^*} \qquad (3)$$

where

N: number of companies in the sample;

$\hat{\sigma}^*$*:* estimate of the cross-sectional standard deviation of the returns.

We also investigate whether Portuguese PIPOs are more underpriced than Portuguese private sector IPOs. We perform a difference t-test and Mann-Whitney-U non-parametric test to evaluate the differences between initial returns of state-owned IPOs and private IPOs[14].

Finally, in order to evaluate the importance of the several theoretical arguments reviewed above, we perform a multivariate analysis. We use the following specification:

$$r^*_i = a + \beta_1 DAYS_i + \beta_2 SIZE_i + \beta_3 EMP_i + \beta_4 FOR_i + \beta_5 ORDER_i + \beta_6 PARTIAL_i + \beta_7 GOV_i + \beta_8 ELECTION_i + \beta_9 ADR_i + \varepsilon_i \qquad (4)$$

where

r^*_i : market-adjusted one-day initial return for privatization offering *i*;

DAYS: number of days between the date of price setting and the first trade date;

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[13] The test statistic is distributed as *t*-Student with degrees of freedom equal to the sample size minus one.

[14] The Mann-Whitney-U is a ranking test that looks at both the sign and the magnitude of abnormal returns.

SIZE: log (total value of the privatization offer);

EMP: dummy variable that equals one for employee participation and zero otherwise;

FOR: dummy variable that equals one for foreign participation and zero otherwise;

ORDER: order of the privatization offering i within the country's privatization program, that equals one for the first share sale privatization offer, two for the second offer, and so forth;

PARTIAL: dummy variable that equals one if the privatization offering *i* is partial (fraction of equity sold by the government inferior to 100%) and zero if 100% of the company is sold;

GOV: dummy variable that equals one if the privatization offering *i* occurred while a right-wing party was governing the country and zero otherwise;

ELECTION: dummy variable that equals one if the privatization offering *i* occurred on a year of parliamentary elections before elections took place, and zero otherwise;

ADR: dummy variable that equals one if the stocks were listed in the form of ADRs in an international capital market and zero otherwise.

The expected signs of the coefficients of the explanatory variables are the following:

Explanatory Variable	**Expected sign**
DAYS	+
SIZE	+/-
EMP	+
FOR	+
ORDER	-
PARTIAL	+
GOV	+
ELECTION	+
ADR	+

According to asymmetric information theories it is reasonable to expect a lower degree of underpricing for larger and more mature firms, operating in stable industries, as they are likely to be followed closely by more analysts, produce more information about their activities, and possibly have longer periods of operation, than smaller and younger firms established in new industries. This effect is proxied by the variable *SIZE*. Yet many privatizations occur in small capital markets and a higher degree of underpricing may be required to warrant the placement of the entire offer. Information asymmetry would also predict that the greater the length of time between offer price setting and first trade date (*DAYS*), the higher the degree of underpricing. The order of the offer (*ORDER*) may also affect initial returns: the degree of uncertainty about the first privatization issue is much higher than other subsequent privatizations. Asymmetric information theories would predict that, for subsequent offers, as the scope and the implications

of the privatization program are revealed, underpricing should be less severe. Finally, governments may list the privatized shares in international exchanges (through ADRs), to signal quality and government's commitment through the privatization program. Therefore, initial returns should be higher for those offers that were listed in foreign markets[15].

To investigate political economic arguments we use several different variables. If governments are concerned with building political support, initial returns in privatizations where a share tranche is reserved to employees (*EMP*) should exceed initial returns where there is no such reserved tranche. The variables *GOV* and *ELECTION* are also included to assess if privatization is used by governments to retain power: higher initial returns should be observed when right-wing parties are leading the country, and when privatization occurs just before parliamentary elections. Again if governments main concern is voters' political support, one should observe that when foreign participation (*FOR*) is allowed, one should observe lower initial returns as a result of higher offer prices to bar wealth transfers to foreigners. Yet one could observe this same effect driven greater demand of shares, improved risk sharing and lower risk aversion that would enhance offer prices. Governments may also try to build political support during the early stages of a privatization program by underpricing first offers (*ORDER*), which satisfies investors and increases their confidence for subsequent offers. If the privatization offer is partial (*PARTIAL*) a higher degree of underpricing may also be used as a mean to assure investors and convince investors to buy in subsequent offers. Partial sales may also require higher underpricing to compensate for the fact that the control shift to the private sector is not effective and therefore the impact on firm expected economic performance is lower.

Data regarding governments in power in Portugal during the period from 1989 to 2001, as well as information concerning the parliamentary electoral dates, were obtained from Portuguese Elections National Commission[16]. Table 4 presents this information.

Information concerning Portuguese privatized companies Depository Receipts listed in the US was obtained in DR Directory of the Bank of New York. Table 5 summarizes this information.

4.3. Results

Table 6 shows the summary statistics of the raw and market-adjusted returns for the 42 Privatization Public Offerings in our sample. Average and median unadjusted and market-

[15] Yet this effect may be mitigated by the way the offer price was determined. More and more offer prices are set after a process of book building involving large international institutional investors, reducing the degree of underpricing.

[16] "Comissão Nacional de Eleições".

adjusted returns over one and seven day periods are positive but statistically insignificant. Considering a holding period of 30 days, average market-adjusted returns become lower and are even negative when we use the S&P 500 as the market benchmark. The parametric t-tests for all periods in the analysis show that there is no significance at the 5% level. As such we cannot reject the null hypothesis that initial returns of Portuguese Privatization Public Offerings are equal to zero. These results do not confirm the findings reported in the literature for other countries.

Yet, as earlier described, these initial returns include sometimes very long periods. The variable *Time to listing* ranges from a minimum of 1 day to a maximum of 476 days. To check if the more extreme observations were affecting the returns we re-calculate the average abnormal return over one, seven and thirty-days periods, excluding from the sample those companies that had a *Time to listing* outside the third quartile of the distribution. We excluded 11 observations. The results obtained for the remaining 31 Privatization Public Offerings are presented in Table 7. Average unadjusted and market-adjusted returns over one, seven and thirty-day periods are now higher than the ones obtained for the full sample of 42 Privatization Public Offerings, and the t-tests are significant at the 5% level. Therefore, after deleting extreme observations, we reject the null hypothesis that initial returns of these 31 Portuguese Privatization Public Offerings are equal to zero, and confirm the phenomenon of underpricing in the short-run.

We then compute initial returns to investors for the sub-sample of 19 PIPOs and compare these returns with the ones observed for the control sample of private IPOs. Table 8 shows the raw and market-adjusted returns for PIPOs and private IPOs. The sub-sample of PIPOs shows higher average and median unadjusted and market-adjusted returns than those observed for the entire sample of Privatization offerings (initial and subsequent) separately from subsequent offers. In any case, initial returns are low and barely significant, except for market-adjusted one-day returns using the PSI GERAL as the market benchmark. For the 15 private IPOs, and for every holding period considered in the analysis, the returns are positive and statistically significant.

As before, we re-calculated returns for PIPOs excluding from the sample those companies that had a *Time to listing* outside the third quartile of the range (5 observations). These results are presented in Table 9. The results are very similar to those shown in table 8 and as before are not statistically significant.

Table 10 shows the test statistics for the difference t-test and Mann Whitney U-test. The results indicate that we reject the null hypothesis that the average initial returns for PIPOs are equal to the average initial return in private IPOs for a 30-day holding period. Student T and

Mann-Whitney U tests are consistent and significant at a 5% level. As for one and seven days, the t-statistics for the difference t-tests are insignificant. Yet the non-parametric test allows us to reject the null hypothesis that the price impact of PIPOs and private IPOs is the same.

Overall, results suggest that privatizations yield, on average, lower initial returns than private new offerings, which contradicts previous research reporting that PIPOs tend to be more underpriced than other IPOs. In Almeida (2000), the average initial return for the 24 IPOs analyzed (that include PIPOs) is positive and statistically significant (7.27%). We find a lower underpricing effect. This may stem from the fact that we use a more extensive sample period that includes more recent offerings for which underpricing was lower. This could either reflect uncertainty resolution as the privatization process evolved, or/and lower demand for latter offerings.

To identify the factors that may affect the short-term price behavior in privatization offerings, we run univariate tests to check for differences in market-adjusted one-day returns for several sub-samples formed on the basis of the dummy variables. These are employee participation (EMP), foreign participation (*FOR*), partial or total privatization (*PARTIAL*), party of the government that leads the country (*GOV*), date of the parliamentary elections (*ELECTION*) and ADR listing (*ADR*). Results are presented in Table 11. The results obtained from the tests are very weak except for the dummy variable *GOV*. The results suggest that whenever the privatization offering occurs with a left-wing party governing the country, (one-day market adjusted returns using the S&P 500 as the market benchmark) initial returns seem to be higher, which contradicts the hypothesis that right-wing parties are more populist and make more use of privatization offers to attract voters political support as a strategic policy to retain power.

The results of the multivariate analysis are reported in Table 12. The fit of the model is extremely poor and the individual parameter estimates are not significant[17]. The signs of the coefficients of the explanatory variables *SIZE*, *ORDER*, *PARTIAL* and *ADR* are as predicted by the literature: the degree of underpricing is greater for large issues, for initial offerings, when the privatization is partial and when shares are cross-listed. As for the variables *DAYS*, *EMP*, *GOV* and *ELECTION* the signs of the coefficients contradict the theoretical arguments. The underpricing is lower with right-wing parties and in the years elections took place. Results for the

[17] The t-statistics after performing the White correction are very similar and are available upon request.

dummy variable *FOR* are also not significant, suggesting that the influence of foreign investors on the privatization initial returns is trivial[18].

In sum, the results of univariate and the multivariate analyses are not conclusive. Even if for several of the variables analyzed, the economic relationships are as predicted, the estimates lack statistical significance and this may stem in part from the small sample in our study. Overall results seem to be consistent with asymmetric information and agency arguments and do no support the claim that governments deliberately underprice privatization offerings for political factors as predicted by Biais and Perotti (2002).

5. Long-Run Market Performance

5.1. Theoretical Predictions and Previous Findings

Several studies examine the long-run returns from privatization offerings. While in private IPOs, there seems to be strong evidence of negative long-term returns, in privatizations offerings, there is evidence of long-term positive and statistically significant abnormal performance[19]. The most recent studies cover a large number of countries (and offerings) and use several methods to control the several problems with estimates ands test statistics of long-run returns, and the positive performance is robust to those tests[20]. Further the results suggest that PIPOS outperform IPOs in the long-run[21].

Most studies analyzer the returns earned by investors who buy privatized shares at the first closing market prices and hold stocks up to 1, 3 and 5 years. Some studies also look into the determinants of the observed returns. Several explanations have been put forward to account for the long-run performance of privatized shares. While some arguments are valid for any IPOs, privatization offerings have different characteristics that have to be accounted for.

Ibbotson, Sindelar and Ritter (1994) present three possible explanations for the long-run performance of IPOs: divergence of opinion, the empresario hypothesis and windows of opportunities. Ritter (1991) proxies these effects with variables such as size, age, industry and initial underpricing[22]. For the particular case of privatization offerings, additional variables that may affect long-run performance are associated with management shifts resulting from the

[18] We run the regression for the sub-sample excluding the "outliers" as described above. The results are very similar except for the specification explaining one-day initial returns where the negative coefficient of the variable *ORDER* is now statistically significant at a 5% level.

[19] For evidence regarding the long-term performance of IPOs and PIPOs, respectively, please refer to Jenkinson and Ljungkvist (2000) and table 9 in Megginson and Netter (2001).

[20] See, for example, Barber and Lyon (1997) or Kothari and Warner (1999).

[21] See, for example, Boardman and Laurin (2000) or Dewenter and Malatesta (2001).

[22] Boardman and Laurin (2000) report that privatization offerings are larger and older and operate in more mature industriesd and have therefore lower growth prospects than the typical IPO firm.

transfer of state to private ownership, and the resulting improvements in economic efficiency. Political risk is an obvious distinctive feature of privatization offerings that may play an important role in understanding the behavior of returns over time.

Boardman and Laurin (2000) use a variable to measure the timing of a particular offering within the process of privatization in a country. They also account for the portion of retained government ownership (and golden shares) and for different regulating and competitive environments. Perotti and Van Oijen (2001) also use a proxy for political risk and suggest that the progressive resolution of political risk as the privatization program evolves, leads to more positive returns. Yet in the long run, after the initial correction, one should observe lower returns reflecting lower risk. Finally, and similarly to what happens with private IPOs, the decision to cross-list may impact the returns of the privatized firms' shares in the long run[23].

Very few studies provide evidence on the determinants of the long-run returns in privatizations and the proxies that are used can account for several different theoretical arguments. For example, Boardman and Laurin (2000) find that privatizations, occurring later in the process, show greater excess positive returns but this variable could equally well proxy agency, asymmetry or political risk arguments. Aybar (2002) show that emerging market PIPOs underperform developed markets issues. Yet this difference could either support political or agency risk arguments.

5.2. Methodology

To investigate long-run performance we use the methodology proposed by Ritter (1991) as in several other studies for single country studies. We investigate the sign and magnitude of long-run abnormal returns to investors in Portuguese privatization offerings. Further we analyse if there are statistically significant differences between PIPOs and private IPOs long-run performance.

Abnormal returns are defined as in (3). The average market-adjusted return on a sample of N companies in event period t is the equally weighted arithmetic average of the benchmark-adjusted returns:

$$AR_t = \frac{1}{N}\sum_{i=1}^{N} r^*_{it} \qquad (5)$$

The cumulative market-adjusted aftermarket performance from q to s is the summation of the average market-adjusted returns:

[23] See Foerster and Karolyi (2000).

$$CAR_{q,s} = \sum_{t=q}^{s} AR_t \qquad (6)$$

The parametric tests proposed in the literature rely on the important assumption that abnormal returns are normally distributed. The standard *t*-statistic to test the significance of abnormal returns is[24]:

$$t = AR_t / S(AR_t) \qquad (7)$$

where

AR_t: average market-adjusted return in event period *t*;

$S(AR_t)$: estimate of standard deviation of the average abnormal returns $\sigma(AR_t)$.

To conduct the multivariate analysis we follow the model proposed by Boardman and Laurin (2000). They regress three-year CARs against (i) the relative size of the firm, measured by the market capitalization of the privatized firm divided by the total capitalization of the market; (ii) the percentage of ownership retained by the government; (iii) a dummy variable that equals one if the government retains a special share (Golden Share) and zero otherwise; (iv) the initial underpricing measured by the returns earned in the first days after listing; and (v) a dummy variable that equals one if the privatization occurred relatively late in the country and zero otherwise. We propose the following specification:

$$CAR_{1,36\,i} = a + \beta_1 MR_i + \beta_2 SIZE_i + \beta_3 ORDER_i + \beta_4 PARTIAL_i + \beta_5 ADR_i + \beta_6 LATE_i + \varepsilon_i \qquad (10)$$

where

$CAR_{1,36\,i}$: three-year cumulative abnormal return for privatization offering *i*;

MR: market-adjusted (one, seven or thirty-day) initial return;

LATE: dummy variable that equals one if the privatization offering occurred relatively late in the country and zero otherwise.

SIZE, *ORDER*, *PARTIAL* and ADR are defined as in section 4.2. above.

The variable *MR* that refers to the initial underpricing may be seen as a proxy for over optimism. Perotti (1995) shows that when the policy uncertainty is high, underpricing is seen as a sign for a government's commitment with the privatization program. Therefore, a higher degree of underpricing should have a positive effect on long-run privatization returns. On the other hand, that kind of commitment may reduce the premium required by investors and yield lower required returns in the long-run.

[24] Under the null hypothesis of no abnormal performance, the statistic is distributed as Student-*t* with *T-d* degrees of freedom.

The effect of *SIZE* on long-run stock price performance stems from asymmetric information theories. It is reasonable to expect that there should be less uncertainty about larger and mature firms, operating in stable industries, than in small and young firms established in new industries. In fact, the existence of lower uncertainty implies lower risk and, subsequently, lower required returns for larger offerings. In that case, small size offerings would show higher long-term returns due to higher uncertainty. Yet several authors suggest that small firms should outperform large firms due to greater economic efficiency improvements.

The *ORDER* of the offer may also affect long-run returns. If it is a first privatization offer, the government will retain some percentage of ownership to sell eventually in subsequent offerings. This might be interpreted as a signal that government is still interested in the company, which would lead to a negative relationship between the order of the offer and long-run performance. This effect may be better captured by the variable *PARTIAL* due to the fact that if governments decide not to sell immediately 100% of the shares of the companies, but prefer to do it slowly, investors may interpret this as a positive sign of commitment with the privatization program, having a negative effect on long-run performance due to the lower risk. Yet, partial privatizations may also reflect the interference of the governments in the offerings and, therefore, higher risk leading to higher returns.

As for the explanatory variable *ADR*, listing the privatization offering on an international market may be seen as a sign of quality and government's commitment through the privatization program, reflecting lower risk and lower required returns. In addition, one could expect that returns would be lower reflecting lower required returns due to the presence of foreign sophisticated investors.

Finally the variable *LATE,* motivated by Boardman and Laurin (2000), measures the effect of when a specific offer occurred in a particular country. This variable equals one if the privatization occurred relatively late in the country and zero otherwise. In fact, early privatization offerings that did not have any previous track record, might have been considered riskier.

The expected signs of the coefficients of variables of equation (10) are the following:

Explanatory Variable	**Expected sign**
MR	<0 or >0
SIZE	<0
ORDER	<0 or >0
PARTIAL	<0 or >0
ADR	<0
LATE	<0

5.3. Results

Table 13 shows the six-month ARs and CARs for 6, 12, 18, 24, 30 and 36 months after the offering. ARs and CARs are negative and only statistically significant when using S&P 500.

Tables 14 and 15 present the excess returns for the sub-sample of PIPO and IPOs, respectively. For PIPOs, ARs and CARs are negative as well in all months. Yet the results are only statistically significant when considering S&P 500 and for longer holding periods of 30 and 36 months.

For private IPOs results are very different. ARs and CARs start being positive in the first 6 months, decreasing afterwards to negative values up to three years. Yet, again, results are not statistically significant, except for ARs in the second and third year following the offering and when S&P 500 is used as the market benchmark.

To evaluate if the Portuguese private IPOs and PIPOs show different long-term performance we use a difference t-test and a Mann-Whitney U test. Table 16 reports the main results. The null hypothesis that the average CAR for PIPOs is equal to the average CAR for private IPOs is not rejected for all event periods considered in the analysis. Yet privatizations yield, on average, lower CARs than private offerings up to 1 year. Over longer horizon periods, private IPOs tend do underperform PIPOs[25].

We further analyze if the variables used as proxies for the different theoretical arguments discussed above could account for the long-term return behavior in Portuguese privatization offerings. We performed univariate analyses to check for differences in the three-year CARs for sub-samples formed on the basis of the dummy variables *PARTIAL*, *ADR* and *LATE*. Results are presented in Table 17. The differences in returns are consistent with the predictions exposed above. Yet the t-tests are not statistically significant, except for the dummy variable *PARTIAL*, (using as market benchmark the PSI GERAL). As for the multivariate analysis, the estimates of the OLS regression, shown in Table 18, are very weak as well, and not significant, except for the variable *PARTIAL*[26]. The positive and statistically significant sign of the coefficient obtained for the explanatory variable *PARTIAL* could suggest that, when governments choose to privatize partially, investors require higher returns anticipating interference of governments on the privatized firms and, therefore, higher political risk. The observed effect contradicts the argument that partial privatization signals government commitment and reduces uncertainty, and is inconsistent with arguments that predict higher returns for total privatizations for larger expected economic efficiency gains. The downward shift in returns, reflected in the intercept

[25] Almeida (2000) reports that, on average, Portuguese offerings underperform after one year. Yet the value-weighted average excess return is positive.

[26] The t-statistics with White heteroskedasticity consistent standard errors are very similar.

estimate, is thus offset (more than offset when we look at S&P 500 market adjusted returns) by the effect of partial privatization.

The coefficient associated with the variable *MR* is positive suggesting, as expected, that when the underpricing is large, and after controlling for other effects, this is perceived by investors as a sign of government's commitment with that privatization offering. Yet the large part of the initial positive return is nevertheless reversed (if we sum this effect with the intercept estimate). This negative aftermarket effect is consistent with overreaction and fads in PIPOs. As for the other explanatory variables, the results are mixed and flip signs with the choice of the market index.

In sum, we find that long-term excess returns are negative (but seldom significant), even if Portuguese PIPOs outperform private IPOs. The statistics for the difference in means tests are inconclusive and most of the estimates of the OLS regression lack statistical significance. Again, as for the analysis in section 4., this lack of significance may result from small sample size. Overall results suggest that the initial price overreaction seems to be corrected in the aftermarket, and that political risk seems to influence returns in the long-run.

6. Conclusions

This paper evaluates the short and long term performance of Portuguese privatization offerings and investigates the determinants of the observed performance. Our main findings are:

1. Portuguese privatization offerings show initial positive returns but lack statistical significance.
2. Portuguese privatization IPOs underperform private sector IPOs contradicting most of the previous evidence.
3. The degree of underpricing is greater for large issues, for initial offerings, when the privatization is partial and when shares are cross-listed. The underpricing is lower with right-wing parties and in the years before elections. Overall these results are consistent with information asymmetry and agency predictions.
4. In the long run, privatization offerings have negative abnormal returns, contradicting the most recent evidence.
5. While in early event months, privatization public offerings yield more negative returns than private sector offerings, this effect is reversed in longer horizon periods.
6. Our results suggest that initial overreaction seems to be reversed in the years following the offer and that investors require higher returns in partial privatizations.

The small sample size may explain partially why we fail to find statistically significant average excess returns and non-trivial influences for the variables we investigate.

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Table 1 – Summary Statistics for the Portuguese Privatizations Public Offerings

This table reports information concerning the 66 privatizations that occurred in Portugal in the period 1989-2001.

Year of Privatization	Nr. Privatizations	Gross Proceeds (€ thousand)	% of Partial Privatizations
1989	4	353 327	100%
1990	5	692 795	80%
1991	5	553 478	60%
1992	12	1283 477	42%
1993	7	327 628	29%
1994	4	344 058	75%
1995	7	550 590	71%
1996	6	491 154	83%
1997	6	1 989 737	100%
1998	4	2 192 530	100%
1999	2	2 718	100%
2000	2	5 258	100%
2001	2	610	100%
Total	66	**8 787 360**	

Source: Dathis

Table 2 – Gross Proceeds of Portuguese Privatization Public Offerings

This table presents the gross proceeds (in thousand euros) of Portuguese privatization public offerings, as well as its breakdown in initial (PIPOs) and Secondary Offers (PSPOs)

	Total	**Mean**	**Median**	**Std. Dev.**
All (n=42)	8 475 096	201 788	124 529	276 135
PIPOs (n=19)	3 917 192	206 168	142 634	224 305
PSPOs (n=23)	4 557 887	198 169	66 289	317 660

Table 3 – Descriptive Statistics for Portuguese Private IPOs

This table presents the main descriptive statistics for the Gross Proceeds (thousand euros)

	Total	**Mean**	**Median**	**Std. Dev.**
Private IPOs (n=15)	419 535	27 969	16 959	29 216

Table 4 – Portuguese Parliamentary Elections for the Period 1989-2001

This table reports summary information concerning the dates and the winners of parliamentary elections occurred in Portugal during 1989-2001.

Date of the Election	Winner party	Right/Left wing
19-07-1987	PSD	Right-wing
06-10-1991	PSD	Right-wing
01-10-1995	PS	Left-wing
10-10-1999	PS	Left-wing
17-03-2002	PSD	Right-wing

Source: Comissão Nacional de Eleições
PSD: Partido Social Democrata
PS: Partido Socialista

Table 5 – Depositary Receipts of Portuguese Privatized Firms Shares

This table reports summary information concerning Portuguese privatized companies DRs listed in the US

DR Issue	Exchange	Ratio ADR:ORD	Industry	Deposit	Date
Ptelecom	NYSE	1:1	Fixed Line Comm.	BNY	01-06-1995
Portucel	PORTAL	1:1	Forest Products & Paper	CIT	28-06-1995
Cimpor	PORTAL	1:2	Building Materials	CIT	18-10-1996
EDP	NYSE	1:10	Electric Utilities	CIT	19-06-1997

Source: Bank of New York DR Directory

Table 6 – Initial Returns for Portuguese Privatization Public Offerings

This table presents the average and median unadjusted and market adjusted initial returns for 42 Portuguese Privatization Public Offerings. Returns are measured over intervals of 1, 7 and 30 calendar days following initial trading of the shares. Market index data refers to PSI GERAL and S&P 500. t-tests refer to two-tailed tests. [a] denotes significance at the 5% level.

n=42	**Unadjusted Returns (%)**			**Market-Adjusted Returns (%) PSI GERAL**			**Market-Adjusted Returns (%) S&P 500**		
	1 day	**7 days**	**30 days**	**1 day**	**7 days**	**30 days**	**1 day**	**7 days**	**30 days**
Average	1.10	1.24	0.47	1.49	1.39	0.69	0.50	0.60	-0.45
Median	2.60	2.68	1.87	2.81	2.64	2.34	1.87	2.24	1.95
t-statistic	(0.812)	(0.874)	(0.312)	(1.024)	(0.921)	(0.454)	(0.342)	(0.399)	(-0.275)

Table 7 – Initial Returns for 31 Portuguese Privatization Public Offerings excluding Outliers

This table presents the average and median unadjusted and market adjusted initial returns for 31 Portuguese Privatization Public Offerings. Returns are measured over intervals of 1, 7 and 30 calendar days following initial trading of the shares. Market index data refers to PSI GERAL and S&P 500. t-tests refer to two-tailed tests. [a] denotes significance at the 5% level.

n=31	**Unadjusted Returns (%)**			**Market-Adjusted Returns (%) PSI GERAL**			**Market-Adjusted Returns (%) S&P 500**		
	1 day	**7 days**	**30 days**	**1 day**	**7 days**	**30 days**	**1 day**	**7 days**	**30 days**
Average	3.81	3.98	3.59	3.49	3.42	3.06	3.42	3.69	3.36
Median	3.63	3.25	3.16	2.95	2.71	2.83	3.43	3.19	3.36
t-statistic	(3.816)[a]	(3.875)[a]	(3.127)[a]	(3.697)[a]	(3.255)[a]	(2.797)[a]	(3.472)[a]	(3.634)[a]	(3.051)[a]

Table 8 – Initial Returns for Portuguese PIPOs and Private IPOs

This table presents the average and median unadjusted and market adjusted initial returns for PIPOs and private IPOs. Returns are measured over intervals of 1, 7 and 30 calendar days following initial trading of the shares. Market index data refers to PSI GERAL and S&P 500. t-tests refer to two-tailed tests. [a] denotes significance at the 5% level.

PIPOs n=19	**Unadjusted Returns (%)**			**Market-Adjusted Returns (%) PSI GERAL**			**Market-Adjusted Returns (%) S&P 500**		
	1 day	**7 days**	**30 days**	**1 day**	**7 day**	**30 days**	**1 day**	**7 days**	**30 days**
Average	3.31	3.04	1.64	3.38	3.11	1.41	2.69	2.43	-0.02
Median	3.00	2.83	1.35	2.95	2.71	1.85	2.76	2.61	1.45
t-statistic	(1.814)	(1.628)	(0.787)	(2.137)[a]	(1.769)	(0.766)	(1.442)	(1.188)	(-0.010)

Private IPOs n=15	**Unadjusted Returns (%)**			**Market-Adjusted Returns (%) PSI GERAL**			**Market-Adjusted Returns (%) S&P 500**		
	1 day	**7 days**	**30 days**	**1 day**	**7 day**	**30 days**	**1 day**	**7 days**	**30 days**
Average	8.55	9.38	9.93	7.83	8.62	8.21	8.24	9.35	9.51
Median	7.74	7.37	6.12	6.69	5.25	6.03	6.27	6.72	7.27
t-statistic	(4.195)[a]	(3.499)[a]	(3.467)[a]	(3.841)[a]	(3.685)[a]	(3.769)[a]	(4.077)[a]	(3.614)[a]	(3.423)[a]

Table 9 – Initial Returns for the Sub-sample of PIPOs – Excluding Outliers

This table presents the average and median unadjusted and market adjusted initial returns for 14 PIPOs. Returns are measured over intervals of 1, 7 and 30 calendar days following initial trading of the shares. Market index data refers to PSI GERAL and S&P 500. t-test refers to two-tailed tests. [a] denotes significance at the 5% level.

PIPOs n=14	**Unadjusted Returns (%)**			**Market-Adjusted Returns (%) PSI GERAL**			**Market-Adjusted Returns (%) S&P 500**		
	1 day	**7 days**	**30 days**	**1 day**	**7 days**	**30 days**	**1 day**	**7 days**	**30 days**
Average	3.06	3.13	2.89	3.20	3.13	2.41	2.47	2.79	1.74
Median	3.12	2.88	2.26	2.89	2.74	2.64	3.07	2.70	2.36
t-statistic	(1.766)	(1.613)	(1.333)	(1.724)	(1.516)	(1.098)	(1.556)	(1.620)	(0.883)

Table 10 – Tests of Differences between PIPOs and Private IPOs Average Initial Returns

This table reports the average difference in initial returns of state-owned (#19) and privately-owned offerings (#14). Returns are in %. t- and z-tests refer to two-tailed (Student and Mann-Whitney U) tests. [a] denotes significance at the 5% level.

	PIPOs			Private IPOs			Difference		
Period	**Raw Return**	**Market-Adjusted Return PSI GERAL**	**Market-Adjusted Return S&P500**	**Raw Return**	**Market-Adjusted Return PSI GERAL**	**Market-Adjusted Return S&P500**	**Difference in Returns Raw**	**Difference in Returns PSI GERAL (2)**	**Difference in Returns S&P 500**
	(1)	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**		**(3)**
One-day	3.31	3.38	2.69	8,55	7,83	8,24	-5,24	-4,45	-5,55
						t-stat	(-1.914)	(-1.728)	(-2.017)
						z-stat	(-2.098)[a]	(-2.029)[a]	(-2.064)[a]
Seven-day	3.04	3.11	2.43	9,38	8,62	9,35	-6,34	-5,51	-6,92
						t-stat	(-1.939)	(-1.881)	(-2.100)[a]
						z-stat	(-1.856)	(-1.994)[a]	(-2.168)[a]
Thirty-day	1.64	1.41	-0.02	9,93	8,21	9,51	-8,29	-6,80	-9,53
						t-stat	(-2.342)[a]	(-2.378)[a]	(-2.634)[a]
						z-stat	(-2.168)[a]	(-2.029)[a]	(-2.341)[a]

Table 11 – Tests of Differences in Market-Adjusted One-day Returns for sub-samples of Portuguese Privatization Offerings

This table reports the average difference in market-adjusted one-day returns for sub-samples of the 42 Portuguese privatization public offerings formed on the basis of six dummy variables: employee participation (EMP), foreign participation (FOR), partial or total privatization (PARTIAL), party of the government that leads the country (GOV), date of the parliamentary elections (ELECTION) and ADR listing (ADR). Returns are in %. t-tests refer to two-tailed tests. [a] denote significance at the 5% level.

Variable		Difference in Returns (PSI GERAL) (%)	Difference in Returns (S&P 500) (%)
EMP		-2.201	1.857
	t-stat	(-0.227)	(0.192)
FOR		3.153	0.326
	t-stat	(0.335)	(0.036)
PARTIAL		0.102	1.535
	t-stat	(0.043)	(0.517)
GOV		-3.514	-5.165
	t-stat	(-1.440)	(-2.166)[a]
ELECTION		-3.558	-4.249
	t-stat	(-0.820)	(-0.867)
ADR		5.541	6.698
	t-stat	(1.616)	(1.997)

Table 12 – Determinants for Privatization Market-Adjusted Initial Returns

This table shows the estimates of the regression of market-adjusted initial returns for 42 SIPs against the number of days between price setting and first trade date (DAYS); the log of total value of the privatization offer (SIZE); Dummy variables for employee participation (EMP), foreign participation (FOR), partial or total privatization (PARTIAL), party of the government that leads the country (GOV), date of the parliamentary elections (ELECTION) and ADR listing (ADR); and a discrete variable that equals one for the first share sale privatization offer, two for the second offer, and so forth (ORDER). Parameters are estimated by ordinary least squares regression. t-tests refer to two-tailed tests. [a] denotes significance at the 5% level.

30 days Market-Adjusted Returns

(Market index: PSI GERAL)			**(Market index: S&P 500)**		
Regressor	**Coefficients**	**t-statistic**	**Regressor**	**Coefficients**	**t-statistic**
Constant	14.6404	(0.6856)	Constant	12.246	(0.5743)
DAYS	-0.01568	(-0.9088)	DAYS	-0.0285	(-1.6571)
SIZE	-1.2420	(-0.5405)	SIZE	-0.5183	(-0.2259)
EMP	-5.8615	(-0.5570)	EMP	-4.0329	(-0.3838)
FOR	3.1145	(0.5759)	FOR	-1.8506	(-0.3427)
ORDER	-3.3315	(-1.2774)	ORDER	-2.1245	(-0.8158)
PARTIAL	8.2210	(1.7938)	PARTIAL	7.7793	(1.7000)
GOV	-6.3272	(-1.1609)	GOV	-7.2024	(-1.3234)
ELECTION	-2.7529	(-0.6476)	ELECTION	-3.2026	(-0.7545)
ADR	2.0351	(0.3514)	ADR	2.4072	(0.4163)
F-statistic	*1.3401*		*F-statistic*	*2.1048*	

Note: Results obtained for one and seven-day Market-Adjusted Returns are available upon request.

Table 13 – Long-Term Average Abnormal Returns (AR) and Average Cumulative Abnormal Returns (CAR) for Privatization Offerings

This table shows the ARs and CARs for the 42 Portuguese privatization offerings. The number of firms varies over time due to de-listing and new firms. t-tests refer to two-tailed tests. [a] denotes significance at the 5% level.

PSI GERAL					
Months	**Nr. firms**	**AR_t (%)**	**t-Stat. (AR_t)**	**CAR_t (%)**	**t-Stat. (CAR_t)**
6	41	-2.213	(-1.303)	-2.213	(-1.303)
12	40	-1.996	(-0.834)	-4.209	(-1.135)
18	37	-1.321	(-0.488)	-5.530	(-1.006)
24	37	0.329	(0.112)	-5.201	(-0.686)
30	34	-1.468	(-0.388)	-6.669	(-0.800)
36	33	-3.888	(-0.941)	-10.557	(-0.880)
S&P 500					
Months	**Nr. firms**	**AR_t (%)**	**t-Stat. (AR_t)**	**CAR_t (%)**	**t-Stat. (CAR_t)**
6	41	-4.242	(-2.347)[a]	-4.242	(-2.347)[a]
12	40	-5.294	(-1.941)[a]	-9.536	(-2.209)[a]
18	37	-5.474	(-2.010)[a]	-15.010	(-2.429)[a]
24	37	-7.006	(-2.748)[a]	-22.016	(-2.632)[a]
30	34	-10.360	(-3.062)[a]	-32.376	(-2.997)[a]
36	33	-14.049	(-3.409)[a]	-46.425	(-3.280)[a]

Table 14 – Long-Term Average Abnormal Returns (AR) and Average Cumulative Abnormal Returns (CAR) for PIPOs

This table shows the ARs and CARs for the 19 Portuguese PIPOs. The number of firms varies over time due to de-listing. t-tests refer to two-tailed tests. [a] denote significance at the 5% level.

PSI GERAL					
Months	**Nr. firms**	**AR_t (%)**	**t-Stat. (AR_t)**	**CAR_t (%)**	**t-Stat. (CAR_t)**
6	19	-2.999	(-1.086)	-2.999	(-1.086)
12	18	-4.764	(-1.145)	-7.763	(-1.248)
18	18	-1.716	(-0.375)	-9.479	(-0.913)
24	18	-1.054	(-0.215)	-10.533	(-0.712)
30	17	-4.945	(-0.807)	-15.478	(-0.901)
36	17	-8.852	(-1.343)	-24.330	(-1.033)
S&P 500					
Months	**Nr. firms**	**AR_t (%)**	**t-Stat. (AR_t)**	**CAR_t (%)**	**t-Stat. (CAR_t)**
6	19	-5.375	(-1.781)	-5.375	(-1.781)
12	18	-7.735	(-1.708)	-13.110	(-1.794)
18	18	-7.368	(-1.834)	-20.478	(-1.845)
24	18	-9.273	(-2.145)[a]	-29.751	(-2.008)
30	17	-13.473	(-2.405)[a]	-43.224	(-2.236)[a]
36	17	-18.782	(-2.729)[a]	-62.006	(-2.447)[a]

Table 15 – Long-Term Average Abnormal Returns (AR) and Average Cumulative Abnormal Returns (CAR) for Private IPOs

This table shows the ARs and CARs for the 15 Portuguese private IPOs. The number of firms varies over time due to de-listing and new firms. t-tests refer to two-tailed tests. [a] denotes significance at the 5% level.

PSI GERAL					
Months	**Nr. firms**	**AR_t (%)**	**t-Stat. (AR_t)**	**CAR_t (%)**	**t-Stat. (CAR_t)**
6	15	2.848	(0.713)	2.848	(0.713)
12	15	-2.323	(-0.335)	0.525	(0.053)
18	15	-10.998	(-1.422)	-10.473	(-0.614)
24	15	-13.916	(-1.640)	-24.389	(-1.019)
30	14	-15.644	(-1.655)	-40.033	(-1.293)
36	12	-12.557	(-1.156)	-52.590	(-0.700)
S&P 500					
Months	**Nr. firms**	**AR_t (%)**	**t-Stat. (AR_t)**	**CAR_t (%)**	**t-Stat. (CAR_t)**
6	15	3.513	(0.774)	3.513	(0.774)
12	15	-7.590	(-0.948)	-4.077	(-0.350)
18	15	-17.514	(-2.173)[a]	-21.591	(-1.138)
24	15	-20.836	(-2.548)[a]	-42.427	(-1.705)
30	14	-23.769	(-2.802)[a]	-66.196	(-2.057)
36	12	-23.323	(-2.568)[a]	-89.519	(-1.614)

Table 16 – Tests of Differences between PIPOs and Private IPOs CARs

This table reports the average difference in CARs of PIPOs and privately-owned companies IPOs. Returns are in %. t- and z-tests refer to two-tailed (Student and Mann-Whitney U) tests. [a] denotes significance at the 5% level.

	Difference (%)	
Months	**Difference in CARs (%) (PSI GERAL)**	**Difference in CARs (%) (S&P500)**
6	-5.847	-8.888
t-stat	(-1.204)	(-1.631)
z-stat	(-1.093)	(-1.543)
12	-8.288	-9.033
t-stat	(-0.745)	(-0.681)
z-stat	(-0.759)	(-0.651)
24	13.856	12.676
t-stat	(0.463)	(0.422)
z-stat	(-0.506)	(0.434)
36	28.260	27.513
t-stat	(0.034)	(0.028)
z-stat	(-0.044)	(-0.221)

Table 17 – Tests of Average Differences for Sub-samples

This table reports the average difference in three-year CARs for sub-samples of the privatization offerings formed on the basis of the three dummy variables. t-tests refer to two-tailed tests. [a] denotes significance at the 5% level.

	Difference (%)	
Variable	**Difference in Returns (PSI GERAL)**	**Difference in Returns (S&P 500)**
PARTIAL	114.303	90.488
t-stat	(3.339) [a]	(2.112)
ADR	-24.217	-15.349
t-stat	(-0.505)	(-0.345)
LATE	-40.361	17.481
t-stat	(-1.122)	(0.489)

Table 18 – Regression for Three-Year CARs

This table shows the parameters estimated for the regression of three-year CARs for 42 Portuguese privatization offerings against initial underpricing (market-adjusted thirty-day initial returns) (MR); the log of total value of the privatization offer - (SIZE); dummy variables distinguishing partial or total privatization (PARTIAL), ADR listing (ADR) and the timing of privatization (LATE); ORDER that equals one for the first share sale privatization offer, two for the second offer, and so forth. Parameters are estimated by ordinary least squares regression. t-tests refer to two-tailed tests. [a] denotes significance at the 5% level.

Three-Year CARs					
	(Market index: PSI GERAL)			**(Market index: S&P 500)**	
Regressor	**Coefficients**	**t-Statistic**	**Regressor**	**Coefficients**	**t-Statistic**
Constant	-108.3412	(-0.9922)	Constant	-24.0246	(-0.2119)
MR (30-day)	1.9540	(1.4554)	MR (30-day)	1.8613	(1.4226)
SIZE	4.7824	(0.2620)	SIZE	-16.7736	(-0.8911)
ORDER	11.1993	(0.5986)	ORDER	0.5648	(0.0294)
PARTIAL	102.2926	(2.3851)[a]	PARTIAL	73.0630	(1.6386)
ADR	-25.95162	(-0.4590)	ADR	-28.7869	(-0.5004)
LATE	-52.0515	(-1.5716)	LATE	4.0744	(0.1197)
F-statistic	*2.4451[a]*		*F-statistic*	*1.5331*	

Note: Results obtained for one and seven-day market-adjusted returns are available upon request.

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