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The impact of stock exchange performance of selected French privatized firms

Abstract

The impact of privatization on the operational performance of privatized firms is a subject that has been of great interest in recent finance literature. Most of the existing works on this area use conventional variables and compute financial ratios of profitability, productivity, investment, debt and employment in analysing data for financial management. This paper however attempts to determine the effects of privatization on the stock performance of privatized firms, and adopts a comparative approach between stock exchange performance of the privatized firms and the private firms' benchmarks, using data from the period of 1986 to 2005. It is observed from such an approach that the privatized firms have a remarkably higher performance compared to the private firms.

Keywords: French privatization, long-term stock price performance, abnormal returns, underperformance.
JEL Classification: G12, G18, L33.

Introduction

Since the early 1980s, privatization has had a great impact on the management, governance and performance of firms' abnormal returns (*AR*) and cumulative *AR* (*CAR*). The process of privatization, which involves the sale of a public firm to a group of experienced investors, mergers or capital movement into the stock market and launching Initial Public Offering (IPO), can effectively outperform firms' *AR* and *CAR*. There is extensive literature available on the use of conventional variables in determining the performance of the privatized firms, with Megginson et al. (1994), D'Souza and Megginson (1999), Boubakri et al. (2005), Albouy and Obeid (2007), Alexandre and Charreaux (2004), and most recently Power (2009), Huson et al. (2009), Timo (2009) and Moshirian et al. (2010), being among some key contributions using such an approach. This paper will whereas attempt to determine the effects of privatization on stock performance of privatized firms, by adopting a comparative methodology between stock exchange performance of the privatized firms and the private firms' benchmarks, using data from 1986 to 2005 for the study. From this paper, it is observed that the privatized firms have a remarkably, and slightly higher performance compared to selected private firms in France.

Historically, major drive towards liberalization and privatization started internationally in 1980, with France being a major member of the European Union (EU) followed this global trend. In the last two decades, various studies have been conducted to examine whether privatization improves the operating and financial performance of diversified firms. Most studies, including those surveyed by (Megginson and Netter (2001) and Djankov and Murrell (2001) reported significant post-privatization increases in efficiency, profitability, and financial strength.

Stehle et al. (2000) in their study looked at 187 German IPOs and seasoned equity offerings (SEO)'s listed during 1960-1992, and observed that buy-and-hold abnormal returns (*BHAR*) on average underperform in portfolios which consists of stocks of similar market capitalization companies, by 6% in the 3-year post-offering period (See, Timo, 2009). Lyn and Zychowicz (2003) in their studies whereas found that the *AR* are negative and statistically insignificant in both markets. Using Spanish data Alvarez and Gonzalez (2005) observed that Spanish IPOs underperformed after three and five years of listing independently of the benchmark used, and observed negative *BHAR*, which was occasionally statistically significant. The returns measured by calendar-time portfolio methods provided no evidence of long-run performance (see Moshirian et al., 2010). In general previous studies have concluded that there is a non-existence of long-run underperformance (see Choi et al., 2007). Private companies IPO's whereas outperform on the long-run (Dewenter and Malatesta, 1997; 2000) and are statistically positively significant (88.2 percent) for a five-year market adjusted *AR*. A study conducted by Megginson and Netter (2001) which used a large sample of 158 privatization IPOs in 33 countries reported a significantly positive long-run *AR* compared to domestic market indices, the Financial Times World index, the S&P 500 index, and portfolios of American firms in the same industry. The long-run positive abnormal stock returns of privatization IPOs has been interpreted as consistent with documented improvements of operating performance and managerial efficiency of privatized firms (Choi et al., 2010).

The studies conducted by Alexandre and Charreaux (2004) and Albouy and Obeid (2007) both highlight through accounting data the impact of privatization on the operational performances of the French firms. This paper considers a different approach to this,

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and aims to study the impact of privatization with the stock-exchange returns of the privatized firms compared against benchmarks by private firms. This paper undertakes two complimentary methods: either as IPO as of part of the capital of the public firm, or with increase in the capital reserved to private investors with the assumption that the State does not hold majority of the capital of the firm. To answer the fundamental question which turns around the problems of performance induced by the privatization, we supplement the study of Albouy and Obeid (2007) with an empirical study which relates primarily to the comparison of the stock exchange returns between the sample of the quoted privatized firms, and a sample of private firms. To do so we have employed *AR*, *CAR*, *BHAR* and the wealth ratio in our study.

The structure of the rest of this paper is as follows. the Section 1 presents an empirical design and description of data, the research methodology used, which will be followed by findings of the study. The last Section of this paper discusses the findings and provides concluding remarks and future implications for the study.

1. Empirical design and data description

The data which will be used to carry out our tests, the source of this study's data, the research methodology used in the analysis, and the results obtained as a result tests will be discussed in the following subsections.

1.1. The data. This study is related to the impact of privatization on the stock exchange performance of the selected French firms. The sample of this study consists of French privatized firms, which also constitute the sample benchmark. A list of the privatized firms was taken from annual reports by the Ministry of Economy to French Parliament between the period of 1995 and 2005, annual reports of INSEE, and from the Dafsaliens database. Private firms were selected using the data base, *Thomson One Banker*, so they are close in size, belong to the same branch of industry and function in the same market. To avoid a maximum skew of information, in the case of absence of private firms which function on the same market, firms which operates only at the European market were chosen.

The database "*Privatization Barometer*" counted 145 operations of privatization in France, but these operations did not constitute privatizations themselves. According to our definition of privatization[1], there were only 45 operations counter. This number was further reduced to 18 for three reasons: firstly, due to the missed data about past privatized firms; secondly due to mergers and acquisitions during the stages of sale of certain firms of the public sector to the private sector, which lost their independence by being absorbed by others; and thirdly, recently privatized firms (such as Air France, France Telecom and EDF) were not taken into account as the study requires the availability of the data of the firms three years after its privatization. Our sample is composed of two sub-samples: 18 privatized public firms and 18 private firms over the period of 1986-2004.

This study requires the availability of the stock exchange returns of the privatized firms and the private firms, which constitutes the sample for comparison. The stock exchange data was attained from the data base *Datastream* in *Thomson One Banker* for a period of 36 months after privatization (given monthly). If the date of privatization did not correspond with the date of IPO, which arose in two cases: if privatization follows the introduction, we take the date of privatization; in the occasion of an opposite case, we only have the choice to take the date of introduction.

1.2. The research methodology. The methodology used consists of measuring and analyzing the stock exchange performances of the firms privatized over a period of 36 months, after their date of privatization. To calculate stock exchange returns, we used *CAR* and the *BHAR*.

The *CAR* makes it possible to test if average periodic *AR* differs from zero during the event period. According to Barber and Lyon (1997), this method is prone to three types of biases: the *measurement bias*, the *survivor bias* (also known as the *new listing bias*) and the *skewness bias*, which also suffers from positive asymmetry. *BHAR* makes it possible to check if the average *AR* at the end of the event period and whether it is different from zero. The advantage of this approach is that it represents the point of view of the investor (Lyon, Barber and Tsai, 1999, p.198). On the other hand, this approach generates the three types of bias. Barber and Lyon (1997) and Lyon, Barber and Tsai (1999) recommend the use of *BHAR* even if it is prone to these several biases. Kothari and Warner (1997) in their study compare these two methods of analysis and concluded that they have comparable capacities of rejection. Fama (1998) and Mitchell and Stafford (2000) also recommends the method *CAR* in conjunction with the approach of the *calendar time portfolio*.

To evaluate those *AR*s, we will mainly use two methods: the market index and the size-and-book-

[1] Privatization can be defined as, a transfer by the State of the part of the public sector to the private sector, or of the totality of direct or indirect participations in the capital of the public or nationalized firm; provided this transfer results in a decrease the share held by the State in the capital of the firm which privatized to below 50%.

to-market matching firms. The first method consists of comparing the returns of stock for firms which proceeded to a privatization with the returns from the market on which it functions. In the second method for each firm we can deduce the return of the matching firm from the returns of the observed firm. The studies of Barber and Lyon (1997), and Lyon, Barber and Tsai (1999) conclude that the use of these methods can considerably reduce the survivor bias, the skewness bias and the asymmetric bias. The following comparisons and tests were carried out, in which initially we compared the averages of the returns of the privatized firms with the returns of the matching firms. Following this we tested the *AR* according to the two methods of calculation, and then went on to compare the wealth ratios of the concerned firms.

1.2.1. The comparison of the averages of returns (R_t, AR_t, *and* CAR_t). The tests conducted are based on three essential indicators:

1. The comparison of returns (R_{it} vs. R_{bt}).

The test carried out consists in comparing the return of the samples in two transverse and side dimensions. Initially, we compared the averages of returns of the first sample (R_{it}) with the averages of returns of the size-and-book-to-market matching firms (R_{bt}) over a 36 month period. Following this, we compared the averages of returns of each firm in the first sample with the averages of returns of its benchmark in the matching sample over the same period.

2. The comparison of abnormal return (AR_{it} vs. AR_{bt}).

The second indicator was the abnormal *return* (AR_t). This indicator represents the difference between the return of exchange rate and the return of the market. The difference obtained makes it possible to judge underperformance (negative *AR*) or on-performance of firms over the period which precedes privatization. This Section of the methodology constitutes the heart of the study, relating to merger and acquisition[1].

This is done by calculating the *AR* of the privatized firms and the private firms. The formulas to compute the *AR* are given by:

$$AR_{it} = R_{it} - R_{mt} \text{ and } AR_{bt} = R_{bt} - R_{mbt},$$

where R_{it} and R_{bt} are respectively the returns of the privatized firm *i*, and of the private firm *b*, for the date *t* varying from 1 to 36. R_{mt} and R_{mbt} respectively represent the returns of the markets on which firms *i* and *b* are at the same date function. These markets are supposed to be the same ones, except in those cases where the privatized firms are monopolies on their markets. In such cases, we sought homologous firms in the European market, or if necessary, in the worldwide market.

Essentially, we compared the averages of the *AR* of the privatized firms with the averages of the *AR* of the private firms in the event window of 36 months.

3. The comparison of cumulative abnormal return *CAR*

By cumulating the monthly *AR*s over a period of *t* months, we obtain the *CAR*:

$$CAR_{it} = \sum_{i=1}^{t} AR_{it}.$$

With this method, we carried out a comparison of the average between the *CAR* of the privatized firms and the *CAR* of the private firms. We have developed the test of this indicator in the following Section.

1.2.2. Method of the CAR. This methodology consists of testing if *CAR* is different from zero. To carry out this test, we calculate CAR_{it} (*m*), CAR_{it} (*b*) and CAR_{bt} where:

$$CAR_{it} = \sum_{i=1}^{t} AR_{it}, \text{ where } AR_{it} = R_{it} - R_{mt}.$$

$$CAR_{bt} = \sum_{i=1}^{t} AR_{bt}, \text{ where } AR_{bt} = R_{bt} - R_{mbt}.$$

$$CAR_{ibt} = \sum_{i=1}^{t} AR_{ibt}, \text{ where } AR_{ibt} = R_{it} - R_{bt}.$$

This test that is carried out on the CAR is obtained using the following formula:

$$t_{CAR_{1,t}} = \frac{CAR_{i,t}}{\sigma\left(CAR_{i,t}\right)},$$

$$t_{CAR_{i,t}} = \frac{CAR_{i,t}}{\sigma\left(CAR_{i,t}\right)/\sqrt{n_t}},$$

where $\sigma\left(CAR_{i,t}\right)$ the standard deviation of the *AR*s for the sample of *n* society, and n_t is the number of society for the month *t*.

According to Ritter (1991) and Barber and Lyon (1997), there is a preferred the use of the standard errors as they neutralize the bias of the new issuing. More precisely, the statistical test for the *CAR*1, *t* is given by:

$$t_{CAR_{1,t}} = \frac{CAR_{i,t} \times \sqrt{n_t}}{\sqrt{t \times var + (t-1) \times cov}},$$

[1] Dumontier and Humbert (1996) and Dumontier and Pécherot (1998).

where *var* represents the average of the variances of the sample over 36 months of AR_{it}, and *cov* represents the auto covariance of first order of the AR_t series.

1.2.3. Method of BHAR. This third method was used to measure the long-run performance of the privatized firms and to compare them with that of private firms based on the calculation of the buy-and-hold for *t* periods (36 months). Contrary to the cumulated *AR*s, based on an addition of yields the composed *AR*s were centered on a variable interest rate. This is the calculation of the difference between the value acquired by an investment in the privatized firm, and that given by an investment of a similar amount in *a benchmark* during the same temporal horizon. The long-run return for a firm *i* during the number of month *t* is determined by:

$$R_{i,T} = \prod_{t=1}^{T}\left(1 + r_{i,t}\right).$$

This measure makes it possible to calculate the total returns given by a strategy known as "buy-and-hold", in which a share is acquired at the closing price the first day of negotiation and then preserved until the month *t* after the introduction. The average of returns "buy-and-hold" for the set of firms of each of the two samples during the month *t* after privatization is equal to the average of the returns of each firm over the same period:

$$R_T = \frac{1}{n}\sum_{i=1}^{n} R_{i,T}\ .$$

The abnormal returns "buy-and-hold" adjusted with the normal performance of the rate of profitability (and benchmark) over the same period is defined by:

$$BHAR_{i,T}(m) = \left[\prod_{t=1}^{T}\left(1 + r_{i,t}\right) - 1\right] - \left[\prod_{t=1}^{T}\left(1 + r_{m,t}\right) - 1\right],$$

$$BHAR_{i,T}(b) = \left[\prod_{t=1}^{T}\left(1 + r_{i,t}\right) - 1\right] - \left[\prod_{t=1}^{T}\left(1 + r_{b,t}\right) - 1\right],$$

$$BHAR_{b,T} = \left[\prod_{t=1}^{T}\left(1 + r_{i,t}\right) - 1\right] - \left[\prod_{t=1}^{T}\left(1 + r_{m,t}\right) - 1\right].$$

The first $BHAR_{it}(m)$ represents the difference between the returns of the privatized firms and the returns of the markets, whilst the second $BHAR_{it}(b)$ represents the difference between the returns of the privatized firms and those of the private firms, and the last $BHAR_{bt}$ represents the difference between the returns of the private firms and the returns of their own markets.

The average of the returns adjusted for the period *t* is defined by:

$$BHAR_t = \sum_{i=1}^{n} x_{i,t} BHAR_{i,t}\ ,$$

where X_{it} is equal to $1/n$ if the *AR*s are equiv-balanced (equal-weighted), and equal to MV_it/S_{om}, with MV_{it} pre-balanced by their stock exchange capitalization (value-weighted). *MV* and *n* represent respectively the stock exchange capitalization and the number of 'society' over the corresponding period.

The null hypothesis H_0 states that the *BHAR* for the set of the firms for each one of the two samples over the month *t* is equal to zero:

$$H_0 : BHAR_T = 0\ .$$

To test the null hypothesis, we use the statistical test *t* adjusted-skewness recommended by Neyman and Pearson (1928), and recently used by Lyon et al. (1999). This test is defined by:

$$t = \sqrt{n} \times (S + \frac{1}{3}\hat{\gamma} S^2 + \frac{1}{6}\hat{\gamma}), \text{ where}$$

$$S = \frac{Moyenne(BHAR)_t}{\sigma(BHAR)_t},\ t = 1, 12, 18, 24, 30 \text{ and } 36,$$

$\hat{\gamma}$ is an estimator of the coefficient of skewness (asymmetry):

$$\hat{\gamma} = \frac{\sum_{i=1}^{n}(BHAR_{it} - \overline{BHAR_t})^3}{n\sigma(BHAR_t)^3}\ .$$

It is important to note that the coefficient of skewness is a measure of degree of asymmetry of the distribution. If the coefficient is equal to zero, the distribution is asymmetrical, but if the coefficient is smaller than zero, the distribution is asymmetrical towards the left, or if coefficient is larger than zero, the distribution is asymmetrical towards the right.

1.2.4. The wealth relative. The last method that we use in this study consists of calculating the ratio of the *wealth relative*. This ratio is a specific calculation of the average of the returns of the privatized firms and the average returns of the control-firm during the same period. This is calculated according to the following formula:

$$WR_t = \frac{\frac{1}{N}\sum_{i=1}^{N}\left(\prod_{i=1}^{N}(1 + r_{it})\right)}{\frac{1}{N}\sum_{i=1}^{N}\left(\prod_{i=1}^{N}(1 + r_{mit})\right)}\ .$$

The calculated ratios of the relative wealth for the privatized firms are compared to their market indexes and compared to the private firms, which constitute the sample of comparison. We can also calculate the ratios of the relative wealth of the private firms compared to their market indexes.

1.3. Results. The methodology that we adopted to carry out our study allows us to show our results obtained according to the four methods used. With the objective to clarify these results, we repeat the principles of these methods, in which the first consists in comparing the stock exchange return, the *AR* and the *CAR* of the privatized firms with those of the private firms, which constitute the size-and-book-to-market matching firms. The second method consists of testing the hypothesis of equality of *AR*s and the null hypothesis of the *CAR*. The third method consists of testing the null hypothesis according to which the buy-and-hold *AR* equal to zero, whilst the fourth method represents a calculation of the *wealth relative*.

1.3.1. The comparison of stock exchange returns, the ARs and the CARs. Table 1 recapitulates the results of the comparison of the averages of the returns of the privatized firms, with those of the private firms over a 36 month period.

In accordance with the results of Loughran et al. (1994) study, and of that of Broy and Shatt (2001), which concluded an underpricing of the shares of the new quoted firms in the stock exchange, we noticed in the first month after the introduction in the stock exchange of the privatized firms, a superiority of the returns of these firms compared to the private firms, insofar as the difference of the averages were in favour of the first one. This difference does not keep the same sign in the medium and long-run. In spite of the absence of the significance of our results on this test, we announce that they follow the current results of Sentis (2001) study on the French market, which concluded that the continual increase from the stock exchange performance from firms placed on the stock market. By calculating the average of this difference of the averages over the 36 months, we find a difference in the side of the privatized firms placed on the stock market from 0.006. This difference is however not significant with the confidence error of 5 %.

Table 1. Test of comparison of the returns R_{it} vs R_{bt}

Date	Group statistics				t-test for equality of the averages				Test of Levene on the equality of the variances	
	Variable	N	Average	Standard deviation	Dif. av.	Dif. S-D	t	Sig. (Bilateral)	F	Sig.
T1	1	18	0.0070	0.0506	0.0110	0.1326	0.2451	0.8089	2.5942	0.1165
	2	18	0.0180	0.1832						
T6	1	18	-0.0157	0.0667	0.0305	0.0600	0.9040	0.3744	3.5085	0.0697
	2	18	0.0149	0.1267						
T12	1	18	0.0263	0.0857	0.0133	-0.0072	0.4855	0.6305	0.0003	0.9872
	2	18	0.0396	0.0786						
T18	1	18	0.0161	0.0790	0.0101	0.0380	0.3032	0.7639	1.4307	0.2399
	2	18	0.0262	0.1170						
T24	1	18	0.0209	0.1198	-0.0115	-0.0544	-0.3574	0.7236	2.3918	0.1312
	2	18	0.0094	0.0654						
T30	1	18	0.0137	0.1048	-0.0048	0.0166	-0.1258	0.9006	0.1789	0.6749
	2	18	0.0089	0.1214						
T36	1	18	0.0285	0.1137	0.0101	0.0060	0.2584	0.7976	0.3545	0.5555
	2	18	0.0386	0.1197						

Notes: Variable 1 represents the privatized firms, the difference represents $R_{it} - R_{bt}$, similar for the other Tables. The posted results are reduced to 7 per Table (over 36 months), in the objective of simplification. However calculation and analysis relate to the 36 months.

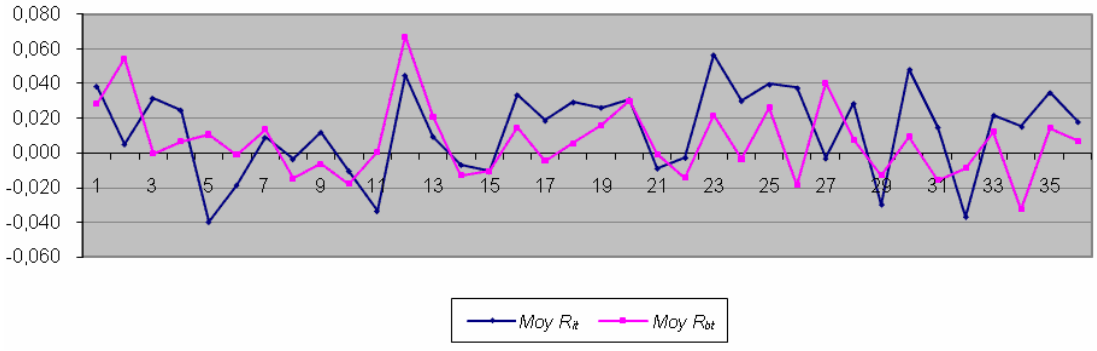

Fig. 1. Comparison of the returns

Table 2 represents the comparison of the *AR* of two samples of tests. A deep study of this Table leads us to note a superiority of the returns of the first sample concerning the sum of the differences of the averages (-0,159). This difference however is not always significant. On the other hand, the significance of the test appears whenever the *AR* of the private firms overrides that of the privatized public firms (month 10 and 32). However, this significance does not enable us to conclude a higher performance clearly of one sample of this study compared to the other.

Table 2. Test of comparison of abnormal return (AR_{it} vs. AR_{bt})

Date	Group statistics				t-test for equality of the averages				Test of Levene on equality of the variances	
	Variable	N	Average	Standard deviation	Dif. av	Df. S-D	t	Sig (Bilateral)	F	Sig.
T1	1	18	0.0176	0.0697	-0.0090	0.0939	-0.2145	0.8321	1.0532	0.3120
	2	18	0.0086	0.1636						
T6	1	18	-0.0249	0.0420	0.0275	0.0503	1.1495	0.2618	2.2851	0.1399
	2	18	0.0026	0.0923						
T12	1	18	-0.0054	0.0861	0.0164	-0.0224	0.6504	0.5202	0.1519	0.6992
	2	18	0.0110	0.0637						
T18	1	18	-0.0079	0.0547	0.0059	0.0305	0.2452	0.8080	1.7512	0.1946
	2	18	-0.0021	0.0852						
T24	1	18	0.0165	0.0934	-0.0258	-0.0192	-0.9180	0.3654	0.3158	0.5778
	2	18	-0.0093	0.0742						
T30	1	18	0.0219	0.0601	-0.0121	0.0381	-0.4455	0.6594	2.2392	0.1438
	2	18	0.0098	0.0983						
T36	1	18	0.0020	0.0867	0.0133	0.0290	0.3912	0.6983	1.9506	0.1716
	2	18	0.0153	0.1157						

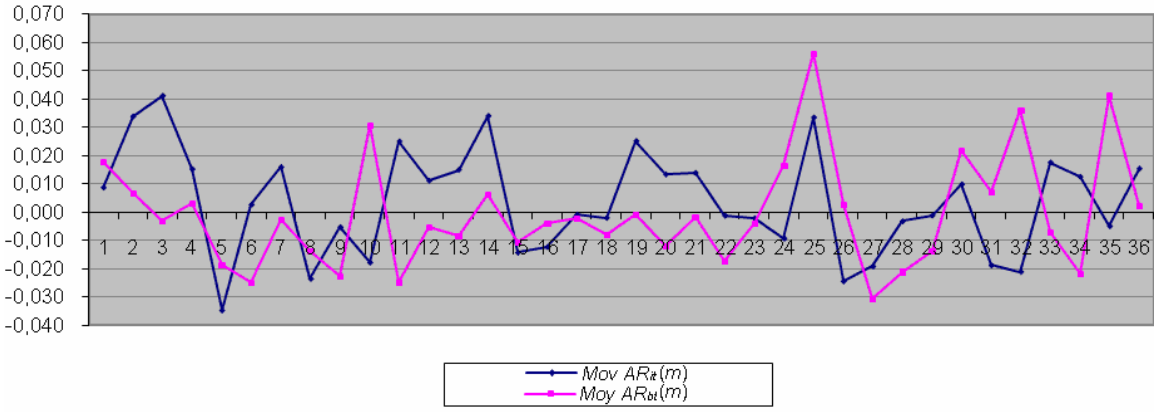

Fig. 2. Comparison of the abnormal return (*AR*)

Table 3 provides more developed comparison based on the *CAR*. This comparison enables us to note a remarkable growth in the performance of the firms which are recently privatized, compared to private firms. The difference of the averages of *CAR* is always positive except in the first month. When these results are statistically significant, the *CAR* of the sample of privatized firms is higher than that of the sample of private firms (for the 21th month: difference in average = + 0.2439 and *t* of Student = 2.1010). The result of this analysis is complementary to the results of two preceding comparisons, which are in conformity in the majority of previous studies carried out in the area. Indeed, the durable superiority of the *CAR* of the privatized firms is due to the short-run performance of these firms.

Table 3. Test of comparison of *CAR* (CAR_{it} vs. CAR_{bt})

Date	Group statistics				t-test for equality of the averages				Test of Levene on the equality of the variances	
	Variable	N	Average	Standard deviation	Dif. Av	Dif. S-D	T	Sig (Bilateral)	F	Sig.
T1	1	18	0.0176	0.0697	-0.0090	0.0939	-0.2145	0.8321	1.0532	0.3120
	2	18	0.0086	0.1636						
T6	1	18	-0.0200	0.1762	0.0864	0.0337	1.3368	0.1904	0.2956	0.5902
	2	18	0.0664	0.2099						

Table 3 (cont.). Test of comparison of *CAR* (CAR_{it} vs. CAR_{bt})

Date	Group statistics				t-test for equality of the averages				Test of Levene on the equality of the variances	
	Variable	N	Average	Standard deviation	Dif. Av	Dif. S-D	T	Sig (Bilateral)	F	Sig.
T12	1	18	-0.0590	0.2581	0.1305	-0.0624	1.7089	0.0973	0.3294	0.5698
	2	18	0.0715	0.1957						
T18	1	18	-0.0862	0.3310	0.1768	-0.0003	1.6034	0.1181	0.0049	0.9444
	2	18	0.0906	0.3306						
T24	1	18	-0.1058	0.4721	0.2358	-0.1514	1.7529	0.0898	0.8540	0.3619
	2	18	0.1300	0.3207						
T30	1	18	-0.0912	0.5239	0.2162	-0.1716	1.4529	0.1567	0.5149	0.4779
	2	18	0.1250	0.3524						
T36	1	18	-0.0338	0.4957	0.1591	-0.1573	1.1247	0.2696	0.9239	0.3432
	2	18	0.1253	0.3384						

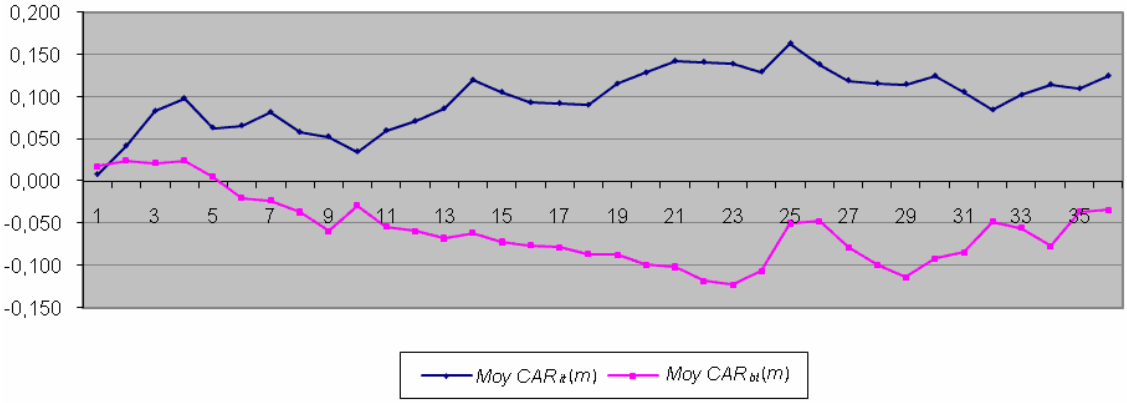

Fig. 3. Comparison of the *CAR*

These tests, and in particular the last one, enables us to conclude that recently privatized firms experience a growth in stock exchange performance which is significantly stronger than that of private firms. This result is in conformity with the results obtained by Albouy and Obeid (2007) on the comparison of the financial performance of two types of firms.

1.3.2. Tests of equality of AR or tests of nullity of CAR. In these tests, three methods of calculation of *CAR* were used. The results of these tests are posted in Table 4. We initially observed the *CAR* calculated starting from the returns of the privatized firms and the market index [$AR_{it}(m) = R_{it} - R_{mt}$]. Though this test does not always appear significant, it is often reliable, especially in the third and fourth months. But this significance of the test appears weak at the end of the third year (36 months). We can understand that, with time, the old public firms are more aligned in normal operations with private firms, and join their performances.

The *CAR* calculated regarding the returns of the privatized firms and the returns of the private firms which constitute the matching sample [$AR_{it}(b) = R_{it} - R_{bt}$] was also tested. The results of this test appear more significant than the results of preceding tests (8 significant results out of 36, against 2 significant results out of 36 for preceding tests). These results explain why the returns of the recently privatized firms are closer to the returns of the market index, than the returns of the private firms. To confirm these results, we carried out a final test based on the comparison of the returns of the private firms and the market index [$AR_{bt} = R_{bt} - R_{mt}$]. The non-significance of this test gives the impression that the private firms follow the returns of the market, and that a transitive relation present enables us to conclude a significant return for the recently privatized firms.

Table 4. Method of the *CAR*: calculation of t-statistic for *CAR*1, *t*

Base calculation / month	1	2	3	4	5	6	7	8	9	10	11	12
$AR_{it}(m)$	0394	1.346	2152*	2.196*	1.269	1.204	1.380	0.921	0.789	0.498	0.808	0.915
ARit(b)	0.387	0.761	1.555	1.499	0.911	1.253	1.653	1.340	1.497	0.952	1.475	1.542
ARbt	0.843	0.800	0.560	0.550	0.100	-0.375	-0.394	-0.595	-0.907	-0.415	-0.740	-0.780
	13	14	15	16	17	18	19	20	21	22	23	24

Table 4 (cont.). Method of the *CAR*: calculation of t-statistic for *CAR*1, *t*

Base calculation / month	1	2	3	4	5	6	7	8	9	10	11	12
	1.062	1.425	1.212	1.037	0.995	0.946	1.175	1.277	1.380	1.336	1.286	1.174
	1.795	2.045*	2.076*	1.940	1.888	1.915	2.047*	2.167*	2.253*	2.199*	2.193*	2.067*
	-0.856	-0.747	-0.850	-0.867	-0.86	-0.929	-0.914	-1.015	-1.008	-1.153	-1.166	-0.987
	25	26	27	28	29	30	31	32	33	34	35	36
	1.446	1.206	1.020	0.974	0.947	1.010	0.844	0.665	0.789	0.872	0.822	0.924
	1.875	1.611	1.630	1.716	1.755	1.696	1.562	1.235	1.321	1.485	1.181	1.221
	-0.455	-0.423	-0.686	-0.857	-0.96	-0.761	-0.690	-0.386	-0.438	-0.602	-0.276	-0.257

Note: * Indicating the significance with the standard error of 5 %.

1.3.3. Method of the BHAR. Table 5 shows the results of the third method, which consisted of testing the null hypothesis according to which the composed *AR* being equal to zero. This return represents a developed approach to the difference between the returns of the privatized firms and those of its matching firms. We calculated the coefficients of *skewness* and the tests statistical *t* of the three *BHAR* for dates 6, 12, 18, 24, 30 and 36 months after the event.

Table 5. Method of *BHAR*

T	$BHAR_{it}(m)$	Coef. of skewness	t-statistic	$BHAR_{it}(b)$	Coef. of skewness	t-statistic	$BHAR_{bt}$	Coef. of skewness	t-statistic
6	0.054	-0.183	-0.216	0.050	-0.196	-0.231	-0.004	0.531	0.628
12	0.072	-0.047	-0.074	0.229	1.319	2.069	-0.065	-1.189	-1.866
18	0.083	0.740	1.380	0.275	0.446	0.831	-0.001	-0.737	-1.374
24	0.103	0.889	1.882	0.300	-0.050	-0.106	-0.018	-0.033	-0.071
30	0.037	0.905	2.120	0.185	-0.123	-0.287	0.093	0.381	0.892
36	-0.017	0.596	1.519	0.197	-0.156	-0.396	0.072	0.386	0.984

Note: The coefficient of skewness measures the degree of asymmetry of the distribution. If the coefficient is equal to 0, the distribution is symmetrical. If it is smaller than 0, the distribution is asymmetrical towards the left. If it is larger than 0, the distribution is asymmetrical towards the right.

For $BHAR_{it}$ (m), we observe negative signs of coefficient of *skewness* for the first two periods (6^{th} and 12^{th} months). According to the definition of the coefficient of *skewness*, these signs convey asymmetry of the distribution towards the left. In other words, the returns of the recently privatized firms are more significant than the returns of the market. These results are thus in conformity with the empirical results of Perotti (1995), Jenkinson and Mayer (1988), Perotti and Guney (1993), which conclude the strong performance from the recently quoted firms in the stock exchange. Starting from the end of the first year, these signs are no longer negative. The coefficients of *skewness* suggest that the market indexes override the returns of the privatized firms. The positive signs, which are more significant than the negative signs, lead us to the conclusion of long-run superiority of the market indexes compared to the returns of recently privatized firms.

By calculating the coefficients of *skewness* on the basis of $BHAR_{it}(b)$, we notice that these coefficients are most of the time negative, especially at the beginning and the end of the period of 36 months. These results reveal an asymmetry of the distribution in favor of the returns of the privatized firms, especially in the last three consecutive months. Though these results are not significant on the level of *t* of Student, they do make it possible to conclude the superiority on the short-run and long-run of the performance of the privatized firms, compared to the private firms. This conclusion however is not the same for the medium term (month 12 and 18). The results of third *BHAR*(*bt*) can be used to confirm the preceding results.

Starting from this method, we can conclude that there is a remarkable performance from recently quoted privatized firms. This behavior can be explained by the management of the privatized firms, and can also be allotted to the famous phenomenon of *underpricing* of the firms during their introduction into the market, which has been the subject of many studies like that of Choi and Nam (1998). According to past theoretical approaches, this underpricing is the result of the asymmetric information available between the issuers of the shares and the dealer in the market.

1.3.4. Method of wealth relative. Table 6 recapitulates the computation results of the wealth relative. The interpretation of this ratio is simple, with the

larger it is the more the numerator overrides the denominator of the ratio of wealth relative. The results of this method confirm that the returns of the recently privatized firms are always higher than the returns of private firms and those of the market.

Table 6. Ratio of the wealth relative

T	WR_{mt}	WR_{bt}	WRb_{mt}
1	1.00853594	1.01090295	1.01779407
6	1.03636902	1.06724102	0.98143037
12	1.02626712	1.13106769	0.9333515
18	1.03680408	1.22649494	0.90621186
24	1.08845417	1.27890201	0.90930205
30	1.09242597	1.21507374	0.94275182
36	1.01495742	1.07973429	0.96915382

Conclusions

The main purpose of this paper is to carry out an empirical study of the stock exchange performance of French firms which have been privatized between 1986 and 2002. This study, which supplements the work completed on the impact of privatizations, justifies insofar as the majority of these operations are in fact of the introductions in the stock exchange.

In accordance with the previous empirical findings, especially those of Perotti (1995), we conclude that there is an increase in the stock exchange returns of the firms recently privatized compared to market indexes and the returns of the matching sample. We also observed through our study that the difference in the performance was in favor of the privatized firms in the first months, and was in favor of the market indexes in the medium-term.

A simple comparison of stock exchange profitability cannot however completely explain the phenomenon highlighted. This is why we carried out a thorough methodology to test the robustness of the results obtained. Thus, the comparison of the *CAR*s confirms the superiority of the performance of the privatized firms.

A found in this study and discussed in the conclusion, in the short-run the asymmetric information is between the issuers of the shares and the shareholders of origin, and in the long-run asymmetry is by the change in productive and organizational operation within the firm after privatization. This is in conformity with the theoretical approaches in favor of the privatization of the firms. This study however suffers from the limitation of the reduced size of the sample of the privatized public firms. Two reasons are behind this limitation: the first is in the operations of mergers and acquisitions, which involved the disappearance of certain privatized firms as independent in society and the second is of certain missed data in past privatized firms.

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