THE FINANCIAL AND OPERATING PERFORMANCE OF PRIVATISED FIRMS IN FRANCE

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Abstract

In the last 30 years, the balance between the public and private sectors around the world, particularly in the West, has changed substantially. In both economically developed and developing countries, privatisation has become a key aspect of structural reform programs. This paper examines the financial performance of French firms that were either partly or fully privatised during the period of 1987-2012 with Initial Public Offering (IPOs). A return-based event study is found useful to measure the financial performance of the privatization and compare it to the rest of IPOs that were launched in the same period.The result including a conditional method of heteroscedasticity known as GARCH (1, 1) shows that the abnormal returns of the privatised firms are significantly different from those of the regular IPO firms.

Keywords: Privatization in France, Financial Performance, Event-Study, Public and Private Relationship, IPOs, Government Policy

INTRODUCTION

Both developed and developing countries have progressively engaged in ambitious privatisation programs for several decades. Over the years, the number of privatisation transactions has grown. From 1988 to 2015(August), the sale of state-owned assets reached $3.258 billion in World countries. Governments raised $218.8 billion through privatization sales worldwide during

2014. To illustrate the relevance of this policy, table 1 shows how the change in European and non EU countries privatization revenues for the year 2014, and is grouped with income level in accordance with the OECD's classification.

Table1: Ranking EU and non EU Countries by Total Privatization Revenues, 2014

Ranking EU Countries by Total Privatization Revenues		Ranking non-EU Countries by Total Privatization Revenues	
Country	Amount (US$ mil.)	Country	Amount (US$ mil.)
United Kingdom	17.176	China	73.617
Spain	13.200	Australia	12.611
Greece	13.016	Turkey	10.000
Italy	7.388	United. States	9.755
Finland	5.786	Saudi Arabia	7.667
Netherlands	3.078	Russia Federation	6.662
Denmark	2.007	India	4.271
Portugal	1.832	Japan	3.902
Cyprus	1.774	South Korea	2.643
10 Other EU Countries	5.939	Malaysia	1.821
2014 total EU	78.411	2014 Total World 48 countries	218.007

Sources: *Privatization Barometer, Securities Data Corporation (SDC)* New Issues and Mergers and Acquisitions files.

The change does not only respond to privatisation strategies, but is also strongly linked to them. It reflects the declining role of the public sector as owner of productive assets in the economy.

Microeconomic theory suggests that incentive and contracting problems create inefficiencies as a result of public ownership; provided that managers of state-owned enterprises pursue objectives that differ from those of private firms (political view) and are less monitored (management view). Objectives are distorted, as well as faced with softened budget constraints because bankruptcy is not a plausible threat to public managers and gives rise to soft-budget constraint. As a preventative measure of financial distress, it is thus in the central government's own interest to bail public managers out in times of financial distress. Theoretical implications are confirmed by numbers of empirical evidences (there are, however, some empirical evidences, which show opposite results), in the sense that changing ownership through privatisation raises profitability and efficiency in both competitive and monopolistic sectors.

In this paper we look at the financial performance of privatised firms in France, since the country has engaged in massive privatisation programs in the last three decades. The process started after the 1986's election when the Chirac government intended to sell shares in 65 state-

owned companies with a total value of 250.000-300.000 million French Frank. The aim was to widen the share holder base among smaller investors. The privatization of state owned companies improved the government's balance sheet and limited the government's financial liabilities (Fraser and Wilson, 1988:108)

The set objectives for privatisation programs in different countries to achieve are far broader, and fundamentally involve the improvement of microeconomic efficiency. Generally, there are four explicit objectives in such programs.

i) to attain higher efficiency in terms of allocation and productivity;

ii) to create a stronger role for the private sector within the economy;

iii) to advance the financial health of the public sector; and

iv) to liberate resources for allocation in other essential areas of activity within the government (normally associated with social policy).

Privatisation programs should, consequently, be considered by looking at the level at which the stated aims have been reached, on one hand, and what role the ownership has played to reach all the above goals, on the other hand. Theoretical arguments behind the view that privatisation can attain these aims as well as surveys of the empirical literature are reviewed.

The Event Study Methodology is deployed to evaluate the financial performance of those French enterprises that experienced either a full or partial change in government ownership through an Initial Public Offering (IPO). This method involves using share prices of the privatised firms and it calculates returns to measure the financial performance on the basis of cumulative excess returns. The cumulative abnormal returns of the privatised firms are compared to those firms that experienced an IPO during the same period.

The rest of this article is organised as follows. In the next section, theories in favour of privatisation and empirical studies worldwide will be discussed. Section 3 is devoted to the data and the methodology used for testing the hypothesis to measure the financial performance of French privatised firms. Section 4 evaluates the financial performance of privatised firms on the basis of abnormal returns, and Section 5 is devoted to the conclusion remarks.

LITERATURE REVIEW

The Managerial Perspective

Low-powered incentives, according to the 'managerial' perspective, are behind imperfect monitoring in public-owned enterprises. The managers of state-owned enterprises are poorly monitored because the firms are not traded in the market as they are with private firms. This means that the threat of take-over when the firm performs poorly is abolished. According to

Yarrow, (1986) and Vickers and Yarrow, (1989), shareholders are unable to observe and affect the performance of the enterprises.

Another argument, which is put forward by this perspective, is that of SOE (state owned enterprises) debt actually perceived as being public debt and traded under different conditions. Debt markets cannot play the role of disciplining the managers of public-owned enterprises. It has been argued that this problem can be solved by privatisation, without having to pursue complete divestiture.

Furthermore, managers of SOEs can increase the scale of production, since bankruptcy is a non-credible threat under public ownership. In contrast, for a private manager, this would be a real threat of failure, which could reduce productive efficiency.

The Political Perspective

It is argued by the 'political' perspective that distortions in the aim, the function (Shapiro and Willig (1990)) and the constraints private managers face, through the so-called soft budget constraint problem (Kornai (1980, 1986)), result in lower efficiency under public ownership. Public managers, who have a tendency to report to politicians and pursue political careers themselves, incorporate objective function aspects relating to the maximisation of employment in their actions. Their desire to maximise their employment is at the expense of efficiency and political prestige (the empire building hypothesis).

Managers do not face the risk of bankruptcy because of soft budget constraint. Wherever firms have engaged in unwise investments, it is in the central government's interest to bail them out using the public budget. The rationale behind this is that the bankruptcy of a firm would be very costly from a political stand-point, and such burden would be distributed within well-defined political groups, such as unions.

The cost of a bailout can instead be shared by the taxpayers, a less organised and larger group in society with assorted interests and preferences. This is because under public ownership, the threat of bankruptcy is non-credible. Thus, we can, by way of a rather simple assumption, obtain the soft budget constraint result as the equilibrium in the race between the public manager and the central government (or "ministry of finance"). This supposition is such that the political loss associated with closing a publicly-owned company is greater than political costs of using taxpayer money to bail it out (or public debt, i.e. future tax collection).

Evidence

Empirical studies to evaluate the privatisation performance can be categorised into two groups: Microeconomic and macroeconomic evidence. More tangible conclusions can be drawn from

the microeconomic perspective rather than from the macroeconomic one. The following case studies span prior to and following privatisation. They exhibit country-specific, cross-sector evidence that looks into performance changes of firms in different sectors within the same country, as well as cross-country evidence that uses data from publicly traded firms in different countries to evaluate changes in their financial status.

Microeconomic Evidence

Some empirical evidences strongly support the view that privatisation has positive effects on profitability and efficiency at the microeconomic level. However, alongside these results, there are, at the same time, some studies, which point to opposite results.

The first piece of evidence consists of case studies, among which Galal, et. al. (1994) shows comprehensive evidence. This study looks at the performance of twelve privatised firms in four different countries. The methodology of their case study is counterfactual and makes projections of the firms' performance fall under the privatisation scenario and a hypothetical "public ownership scenario". Changes in welfare are measured by way of a comparison between these two scenarios. In four cases, consumer welfare has increased; in five of them it has decreased, and it has remained unaltered in the rest. In nine cases, the government has a net gain, and the firm's buyers gained in all of them. Through the partial equilibrium nature of this analysis, a distinctly positive effect of privatisation on total welfare is shown by these firm studies.

The second type of study focuses on one specific country and analyses evidence across industries. LaPorta and López-De-Silanes (1998) analyse the performance of 218 enterprises in Mexico in 26 different sectors between 1983 and 1991. An essential aspect of this work is the authors' decomposition of the changes in profitability into price increases, labour reduction and productivity gains. Two common criticisms of privatisation are addressed by their analysis. The first is that at the expense of society, through charging higher prices, the profitability of firms has increased. The second is that firms have made profits at the expense of workers, whose labour contracts are less generous and involve significant layoffs. Results indicate that profitability, measured through the ratio of operating income to sales, rose by 24 percentage points. However, such gains are decomposed into the following components: i) an increase in price constitutes 10% of the results; ii) laid-off workers constitute 33%; iii) productivity gains constitute 57%. A regression analysis is also carried out to identify the role of market power and deregulation in determining privatisation outcomes.

Smith et al (1996) study privatisation in Slovenia. They use a country-wide database with privatised firms from 1989 to 1992. Their objective is to analyse the effect of various types of

ownership on performance. The results indicate a visibly positive effect of privatisation on ownership performances. Foreign ownership, for example, has shown an outstandingly positive effect on the performance when it comes to distinguishing the effects of different types of ownership. However, it appears that employee-owned firms have performed relatively better than those owned through foreign investment.

Gupta et.al (2008) examine the consequences of privatisation program in the Czech Republic. They used data of the year 1992 at the firm-level for firms with 25 or more workers. The results they found show that privatised firms are among more profitable firms. However, for the government of the Czech Republic the main objective was to maximizing government revenues through selling public assets.

Mestiri (2010) investigates the impact of privatization on the Tunisian government owned airline, Tunisair, over the period of 1976-2007. 20 % of the capital of the Tunisair was privatized by the government using the initial public offering method in July 1995. The author used data envelopment analysis to evaluate the efficiency of Tunisair privatization. After privatizati on Tunisair has experienced a better economic efficiency, as its technical efficiency scores have increased from 0.743 to scores close to 1.

Cross country evidence starts with a very important study by Megginson et al (1994). They analyse pre and post privatisation performance of 61 companies from 18 countries and 32 industries, which were privatised between 1961 and 1990 through public offerings. D'Souza and Megginson (1998) carry out the same type of study by using 78 companies from 25 countries, including 10 LCDs that faced privatisation during 1990 to 1994 through public offering. Their sample includes 14 banks, 21 utility and 10 telecommunication companies. Boubakri and Cosset (1998) use data of 79 companies from 21 developing countries. These firms were privatised between 1980 and 1992 through public offerings.

Claessens and Djankov (1998) use the largest data set, consisting of 6.300 manufacturing firms in seven Central and Eastern European countries, namely Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovak Republic and Slovenia. The performance indicators are analysed by presenting mean and median levels of profitability, sales, operating efficiency, leverage, capital expenditures and employment. There are, in most cases, controls for whether the markets are competitive; regulated or unregulated, as well as controls for partial versus full privatisation. The evidence is robustly in favour of the better performance of firms after privatisation. Profitability has largely increased with varying specifications, periods of time and groups of countries.

Interestingly enough, in both Boubakri and Cosset (1998) and D'Souza and Megginson (1998), profitability increased more than operating efficiency in regulated (or non-competitive)

industries. Thus, higher profitability does not necessary imply higher efficiency, and the market structure links both concepts. The idea that a certain degree of market power is being exploited by firms is also supported by the evidence. In all cases, capital expenditure (investment) systematically increased, reflecting both growth and the post-sale restructuring which took place. Employment increased in all cases, including those of developing countries.

It seems that this evidence on employment is inconsistent with that in, for example, LaPorta and López-De-Silanes (1998) work. There are two justifications for such inconsistency. Firstly, a non-negligible selection bias is generated. The cross-country studies analysed by the authors use only data from firms that were sold via public offerings. Such firms are the ones expected to have higher potential for profitability. Secondly, the author's country-specific study incorporates data from three years prior to the privatisation of all firms. This potentially eliminates labour redundancy prior to sales. Fully privatised firms perform better than partially privatised ones in all of the cases.

Frydman et al (1997) reported improvement in corporate performance that was consistent with the results shown above, in the case of transition economies. Robustly positive performance alterations in a large sample of firms in Central and Eastern Europe were reported by Frydman et al (1998) and Claessens and Djankov (1998). They were interested in testing the political view, i.e. whether the withdrawal of political intervention provides an explanation for the positive results. The former paper found outstanding improvements in total factor productivity and a decline in excess employment in firms without state intervention. It controlled for institutional differences and the endogenity of privatisation choices. The latter paper found evidence that entrepreneurial behaviour drives the efficiency gains on removal of state intervention. The authors conclude that the performance results of privatised companies are the features of a greater willingness to comprehend risks and a liberty to make decisions without state intervention.

Brawn, et. al. (2005) analyse the effects of privatization on state owned manufacturing firms in Hungary, Russia, Romania, and Ukraine. They use time series data of annual observations to compare both before and after privatization performance. They used longitudinal econometric methods to obtain comparable estimates across countries.The result shows a substantially positive effect of privatization on productivity in Romania and Hungry. Moreover, the estimated effects for Romania are significantly bigger than for Hungary. The estimated effects in Ukraine are positive, but lower than Romania and Hungary. Contrary to these countries, the estimated effects are negative for the last county, Russia.

Macroeconomic Evidence

There is no certain evidence of the effects of privatisation at the macroeconomic level. However, it is possible to provide an overview of the patterns observed in key aggregate variables and structural reform measures were also put in place to some extent in most countries. These policy measures include, amongst others, trade liberalisation, fiscal adjustment, tax reform and weakening of controls to capital inflows. Whilst it is impossible to attribute observed trends to one isolated policy, we can argue, on the basis of theoretical arguments, that macroeconomic trends are connected.

Evidence supporting the claim that privatisation reduces the burden on public financing is shown in the aforementioned studies. Following reform, both low and middle income countries have, on average, succeeded in eliminating net subsidies to public enterprises. SOEs display a surplus in their operation as far as middle income countries are concerned. This can result from reforms in management and the introduction of competition, as well as the concept of "best" firms being those which have remained in the hands of the government. For example, oil companies and natural monopolies like electric utilities.

Reforms are being considered in countries where the trend in fiscal deficit is still largely negative. There, the most favourable trend is that of the deficit in upper middle income economies – where the most aggressive reformers can be found, such as Argentina, Chile, Mexico and Malaysia.

A central effect observed in all income groups is that of financial sector development (see Demirguc and Levine (1994) and McLindon (1996)). For both low and middle income economies, reforms have had an impact on that indicator of capital market development; whereas, in high income countries, capitalisation of the stock market has remained stable. All such economies show a positive trend. Upper middle income countries have reached levels of capitalisation similar to those in high income economies (approximately 55% of GDP). The low-income group is approximately 16% and lower middle income economies are roughly 25%.

This mobilisation of resources and consistency of reforms has subsequently attracted more direct investment by foreigners. Middle income countries show a positive trend in foreign direct investment; whereas, low-income countries, in which reforms and privatisation have been more aggressive, show a significant increase of such investment in later years. Lastly, in terms of GDP growth, the pattern is rather stable across income groups with no clear trend. However, in low and lower middle income economies, variability is larger.

Conversely, unemployment shows a rather irregular pattern across countries. Aggressive, late and less aggressive reformers illustrate an increase in the unemployment rate. Argentina and Poland are examples of aggressive reformers, where the unemployment rate

rose by 9 and 8 percentage points, respectively, between 1990 and 1996. France and Hungary are amongst the late and less aggressive reformers, where unemployment grew 3.5 and 3%, respectively, throughout the same period. In terms of privatisation, it is not possible to draw any conclusions on the overall unemployment rate. In recent years, unemployment has shown a rising trend in most countries around the world (see Demirguc and Levine (1994) and McLindon (1996)).

As theoretical stand points support the policy adjustment of selling the government owned enterprises to private buyers and argue that the implementation of policy would lead to higher economic efficiencies of privatised firms, better allocations of resources and consumers benefits, the empirical studies show mixed results. Some studies indicate very higher economic and financial achievements from the policy reform namely privatisation and some show negative results.

METHODOLOGY

The data of some public enterprises, which were privatized, partially or fully, as IPOs at the Paris Stock Exchange (Euronext Paris) are collected. The time period was chosen between 1987 and 2012. As a consequence of these selection criteria, 10 firms are included in the sample. As can be seen in Table 2, the French government has emphasised to privatize public enterprises of different sizes and operating in different sectors of economy such as Manufacturing, Finance & Real Estate Industry, Trade Industry, Transportation, Petroleum Industry, Services Industry Media Industry, Finance And Banking Industry, Telecommunications and utilities.

Table 2: Privatized Companies and Privatization Dates (Initial Public Offering Method)

Privatized Company	Sector	Date of IPO
Air France - KLM	Transportation Industry	09.02.1999
BNP Paribas	Banking	18/10/1993
DassaultSystemesS.A.	Computer Aided Design	03/09/2003
France Telecom S.A.	Telecom	17/10/1997
Icade S.A.	Real Estate	11/04/2006
Renault S.A.	Automotive	17/11/1994
SocietéGénérale S.A.	Banking	08/07/1987
TF1 (Television Francaise 1)	Media	02/06/1988
TOTAL S.A.	Petrol	24/10/1991
Suez Environment	Utilities	28/07/2008

Firms that were privatized as IPOs at the Paris Stock Exchange are being considered as our broad data set. The time period was chosen between 1987 and 2012. Companies which are declined from the Paris Stock Exchange are excluded from our sample. The final sample consists of 10 privatizes IPOs and 9 private IPOs. The sample chosen for evaluation of the financial performance and their time of IPO is shown in Table 1 and private companies and their listing dates are shown in Table 2.

Table 3: Private Companies and Listing Dates

Private Company	Sector	Year of IPO
Pierre Et Vacances	Air Transport	10.06.1999
Credit AgricoleMutuel(C.A. Touraine- Poitou)	Banking	30.06.1993
Locasystem International	Computer Aided Design	29.01.2003
Keyyo (Phone Systems)	Telecom	29.04.1998
Affi Paris (Compagnie Fonciere Fideimur)	Real Estate	10.05.2006
MGI CoutierSA(MGI).	Automotive	23.06.1994
Union Financiere de France Banque SA(UFF)	Banking	17.09.1987
PublicisGroupe SA	Media	04.01.1988
Maurel&Purom	Petrol	17.08.1990

Source: Data Stream and Companies own web sites.

The following approach is used to measure the operating performance of these firms. Based on accounting data that we collected from The Data Stream, we have carried out our analysis. An Event Study is accomplished to evaluate each firm's equity return performances through looking at the shares abnormal returns. To test whether or not a statistically significant change after privatization took place, the standard test for differences in the mean performance of the two populations, is carried out.

Abnormal returns generated during the period of the IPO are used as procedure for measuring financial performance (efficiency) of the firms. What was being considered most was to examine whether or not privatized firms display statistically different cumulative abnormal returns compared to other private IPOs that were undertaken during the same period.

An event study is deployed to evaluate the financial performance of privatized firms compared with the private firms listed in Paris Stock Exchange in the same period. This can be useful method, since all privatized firms included in our sample are stock listed companies through an IPO.

The long run performance of the IPOs is considered on the basis of abnormal returns for the privatized and the same time their private firm counterparts. For each firm in the sample, the abnormal return is defined as the difference between the actual ex post stock return and the normal return (see McKinley, 1997). Thus, for firm *i* and in time period *t* the abnormal return is obtained as:

$$AR_{it} = R_{it} - E(R_{it}|X_t)$$

(1)

where AR_{it} is the abnormal return, R_{it} and $E(R_{it}|X_t)$ are the actual and normal returns for time *t*, respectively, and X_t represents the conditioning information for the return model.

For measuring the normal return the market model is deployed. The return of any given security is conditioning on the return of the market portfolio.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

(2)

where R_{mt} is the time *t* return of the market portfolio, α_i and β_i are market model parameters and ε_{it} is a normally distributed zero mean disturbance term with variance σ_{it}^2, i.e., $\varepsilon_{it} \sim N(0, \sigma_{it}^2)$.

Our sample of firms consists of 9 private firms and 10 state-owned firms that were privatised during the years 1987 to 2012. For making our approach straightforward, we denote private firms as type 1 firms and the state-owned firms as type 2 firms. Moreover, we will introduce the following indexing of returns to make progress in the measurement and the analysis of abnormal returns.

The time period *t* (t=1, 2... T) is divided into three sub-periods: estimation window, event window and post-event window where the sub-periods thresholds are marked by T_0, T_1, T_2 and T_3. Defining *t*=0 as the IPO date, the estimation window of length $L_1=T_1-T_0$ is from T_0+1 through T_1, the event window of length $L_2=T_2-T_1$ from T_1+1 through T_2, and the length $L_3=T_3-T_2$ ranging from T_2+1 through T_3 constitutes the post-estimation window.

L_1 and L_2 are assumed to be the length of the estimation window and the post-estimation window, respectively. Three different estimation window lengths of 200, 400, and 750 days for both types of firms are used, i.e., L_1=200, 400, 750, to estimate the market model parameters of the normal return for a given stock in the sample. The ordinary least squares (OLS) regression method is selected to estimate the market model parameters. For firm *i*, for instance, the OLS estimators for the estimation window are:

$$\hat{\beta}_i = \frac{\sum_{t=T_0+1}^{T_1}(R_{it} - \hat{\mu}_i)(R_{mt} - \hat{\mu}_m)}{\sum_{t=T_0+1}^{T_1}(R_{mt} - \hat{\mu}_m)^2}$$

(3)

$$\hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i \hat{\mu}_m \qquad (4)$$

Where $\hat{\mu}_i = \dfrac{1}{L_1} \displaystyle\sum_{t=T_0+1}^{T_1} R_{it}$ and $\hat{\mu}_m = \dfrac{1}{L_1} \displaystyle\sum_{t=T_0+1}^{T_1} R_{mt}$

Estimating these two parameters, $\hat{\alpha}_i$ and $\hat{\beta}_i$, for each firm, gives opportunity to calculate sample abnormal returns for dates, $t=T_1+1...$ T_2 over a post-estimation window of 1000 days (i.e., L_2=1000) according to:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \qquad (5)$$

To compare the post IPO performance of these two types of firms, the aggregate of the individual securities' abnormal returns over each of the two types of firms is used. For a sample size of N_j individual firms of type j (j = 1, 2), the sample average abnormal return for type *j* firms at period T is given by:

$$\overline{AR_t^j} = \frac{1}{N_j} \sum AR_{jt} \qquad (6)$$

where j = 1, 2. The average abnormal returns of each of the two types of firms, over the post-estimation window, are used to find aggregate abnormal returns. For any interval T_1+1 to $T_2 \leq T_2$ in the post-estimation window, the average cumulative abnormal return for type *j* firms is simply the sum of the included average abnormal returns, i.e.:
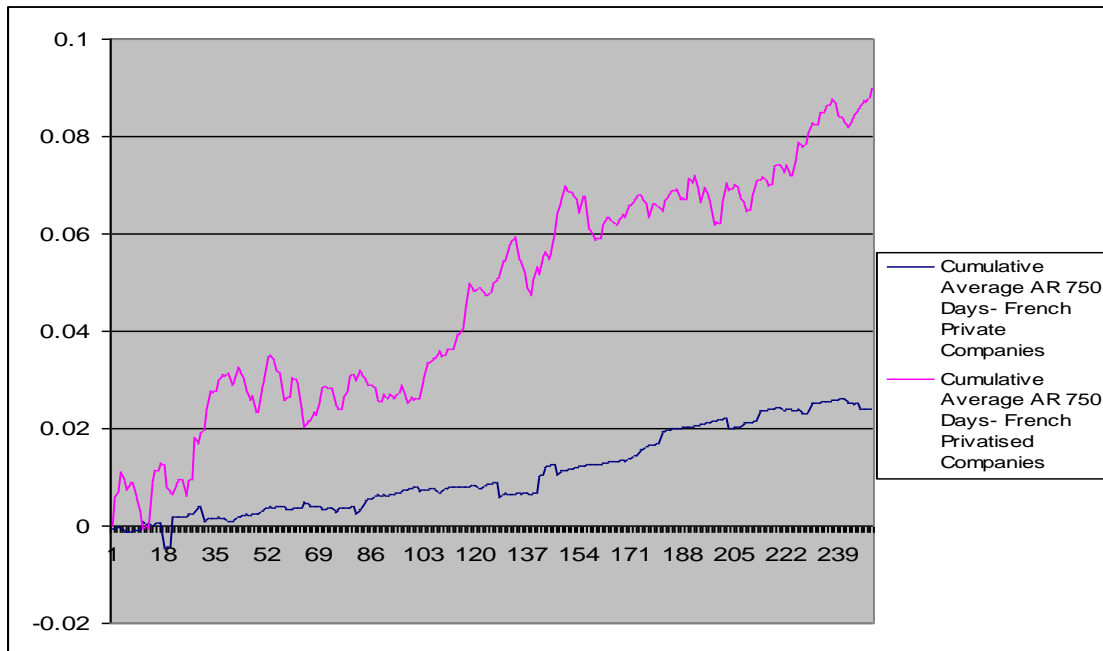
$$\overline{CAR^j}(T_1+1, T_2) = \sum_{t=T+1}^{T_2} \overline{AR_t^j} \qquad (7)$$

OPERATING PERFORMANCE OF PRIVATISED FIRMS

Results from the Empirical Study

Graph 1 shows the average cumulative abnormal returns averaged across the corresponding sample size of firms in each of the two types that result from the estimation of the market model parameters over the 750 days estimation window lengths L_1.

Graph 1: Cumulative Average AR 750 Days

There is an upward trend for both types of firms in graph 1. Type 2 (privatized) firms' cumulative abnormal returns have a positive trend and also performer better than type 1 (private) firms. For 750 days estimation window, the pilot in graph 1 shows that both types of the average sample cumulative abnormal return are fluctuating over time. However type 2 privatized firms average sample cumulative abnormal return fluctuate significantly than type 1 firms. Type 2 (privatized) firms average sample cumulative abnormal return is rising dramatically although Type 1 (private) firms   average sample cumulative abnormal return is rising gradually. To testify these results, which depend on the graph, several test statistics based on the standard errors and average abnormal returns of the sample, reported in different tables, are carried out.

The first test takes account of, the null hypothesis, H_0 that the sample abnormal average return is equal to zero i.e., under H_0 the distribution of the sample abnormal return averaged across all firms in the sample of type j at a given observation in the post estimation window is:

$\overline{AR_t}^{\,j}$ ~ N (0, σ2)

The alternative hypothesis, H_1 implies abnormal average return is not equal to zero. Using sample mean μ, standard error s, and the sample size n, of the aggregated abnormal returns reported in Table 4 and 5, H_0 can be tested using the following test statistic:

T= $\sqrt{n}\mu/s$

Table 4: Descriptive Statistics for Private firms from France

Variable and period	Mean	Standard Error	Standard Deviation	Median
AAR 200 Days – France Private	-0.00010132	7.09595E-05	0.002007036	1.48025E-05
CAAR 200 Days- France Private	-0.043099757	0.001019609	0.028838892	-0.023622464
AAR 400 Days – France Private	-9.36195E-05	8.45098E-05	0.002070059	2.80687E-05
CAAR 400 Days- France Private	-0.027807558	0.001217571	0.029824271	-0.000512186
AAR 750 Days – France Private	9.59107E-05	4.95375E-05	0.000783257	0.000118576
CAAR 750 Days- France Private	0.010781061	0.000541253	0.008557965	0.007922469

Note: AAR stands for average abnormal returns and CAAR for cumulative average abnormal returns

Table 5: Descriptive Statistics for Privatized firms from France

Variable and period	Mean	Standard Error	Standard Deviation	Median
AAR 200 Days – France Privatized	-8.53693E-05	0.000198522	0.005615038	0.000104969
CAAR 200 Days- France Privatized	-0.091711134	0.002049284	0.057962495	-0.118458052
AAR 400 Days – France Privatized	-4.50691E-05	0.000215094	0.005268708	0.00014438
CAAR 400 Days- France Privatized	-0.083946507	0.001333837	0.032672203	-0.090444171
AAR 750 Days – France Privatized	0.000360862	0.000137151	0.00216855	0.000212194
CAAR 750 Days- France Privatized	0.0468686	0.001524027	0.024096982	0.048839973

Note: AAR stands for average abnormal returns and CAAR for cumulative average abnormal returns.

For critical value of α = 5% or 0.05, H_0 can be rejected whenever $|T|$ > 1.96. For average abnormal returns based on the market model parameters that were estimated using the 200 days estimation period (L_1=200), the test statistics yields -20.59 and -6.08142 for the type 1 and type 2 firms, respectively . Similarly, based on the 400 days estimation window (L_1=400) we obtain test values of -22.1559 and -4.19064 for type 1 and type 2 firms, respectively. The 750 days estimation window (L_1=750) we obtain test values of 53.022 and 72.056 for type 1 and type 2 firms, respectively. Hence, for both estimation procedures, the 200, 400 and 750 days estimation window, the null hypothesis that the sample abnormal average return is equal to zero can be rejected for type 1 and type 2 firms at a confidence level of 5%.

Table 6: Calculated AAR t - tests for three estimated windows 200, 400, 750 of type 1 and 2 firms

Type 1: Private firms
T (AAR 200 Private)= $\sqrt{200}$ (-0.00010132/7.09595E-05) = **- 20,59**
T (AAR 400 Private)= $\sqrt{400}$ (-9.36195E-05 /8.45098E-05) = **- 22,1559**
T (AAR 750 Private)= $\sqrt{750}$ (9.59107E-05 /4.95375E-05) = **53,02265**
Type 2: State–owned firms
T (AAR 200 Privatized)= $\sqrt{200}$ (-8.53693E-05 /0.000198522)= **-6,08142**
T (AAR 400 Private)= $\sqrt{400}$ (-4.50691E-05/0.000215094) = **-4,19064**
T (AAR 750 Private)= $\sqrt{750}$ (0.00036086 / 0.000137151) = **72,056**

Note: AAR stands for average abnormal returns. $T = \sqrt{n}\mu/s$

Second test involves the null hypothesis that the mean sample abnormal return for both types of firms is equal. The averages abnormal returns of the sample mean across type 1 and type 2 firms are denoted by μ_1 and μ_2. The null hypothesis is: H_0: $\mu_1=\mu_2$ so in connection with alternative hypothesis implies: H_1: $\mu_1 \neq \mu_2$. Using this test statistics:

$$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$$

The H_0 can be rejected at the confidence level of α =0.05 whenever $|T|$ > 1.96. For three estimation windows, i.e. L_1=200, 400 and 750, we acquire test statistics values of -0.225004668, 0.371793, and 3.024086,respectively. Thus we cannot reject the null hypothesis of equal means of the two types of firms for 200 days and 400 days estimation period although we can reject the null hypothesis of equal means of the two types of firms for 750 days estimation period(L_1=750).

Table 7: Test of equality of mean average abnormal returns.(ARR)

AAR200	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ =(-0.0001-(0.00008))/(0.00007-0.00019) **= - 0.225004668**
AAR 400	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ =(- 0.0000936-(0.000045))/(0.00008-0.00021) =**0.371793**
AAR 750	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ =(0.000095-0.000360)/(0.000049-0.000541253)=**3.024086**

Note: AAR stands for average abnormal returns. $T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$

Finally the average cumulative abnormal returns (CAR) from T_1+1 to T_2 that is over the entire post estimation window are tested for the two null hypotheses above. Under the first null hypothesis, the average cumulative abnormal return is equal to zero.

$\overline{CAR^j}$ (T_1 +1, T_2) ~ N (0, σ^2_c)

where σ^2_c is the variance of the average cumulative returns. Using the appropriate test statistic, values for L_1=200, of -21.1354and -22.3763for type 1 and type 2 firms, respectively found. Similarly based on the 400 days estimation window L_1=400, test statistics values of -18.6476 and -51.3871for type 1 and type 2 firms, respectively are acquired. Finally for the 750 day estimation window, L_1=750, test statistic values of 34.5002and 53.2659 for the type 1 and type 2 firms, respectively are found. Thus, for all estimation procedures the 200,400, and 750 days estimation window, the null hypothesis, which says the average cumulative abnormal return is equal to zero, has to be rejected.

Table 8: Calculated CAAR t-tests for three estimated windows 200,400 and 750 of type 1 and 2 firms.

Type 1: Private firms	
T (CAAR 200 Private)= $\sqrt{200}$ (-0.043099757 / 0.028838892) = **-21.1354375**	
T (CAAR 400 Private)= $\sqrt{400}$ (-0.027807558 / 0.029824271) = **-18.6476**	
T (CAAR 750 Private)= $\sqrt{750}$ (0.010781061 /0.008557965)= **34.5002**	
Type 2: State –owned firms	
T (CAAR 200 Privatized)= $\sqrt{200}$ (-0.091711134 /0.057962495)= **-22.3763883**	
T (CAAR 400 Privatized)= $\sqrt{400}$ (-0.083946507 / 0.032672203)= **-51.3871**	
T (CAAR 750 Privatized)= $\sqrt{750}$ (0.0468686 / 0.024096982)= **53.26599**	

Note: CAAR stands for cumulative average abnormal returns. $T = \sqrt{n}\mu / s$

The second test involves the null hypothesis CAR^1 (T_1+1,T_2) is significantly different from CAR^2 (T_1+1,T_2). Under the second null hypothesis the cumulative abnormal return over the entire post –estimation window is the same for type 1 as well as type 2 firms.

For the three estimation windows, L1=200, L_1=400, L_1=750 we obtain test statistics 47.210, -482.848, and 36.72, respectively**.** For the entire estimation window we reject each null hypothesis.

Table 9: Test for equality of mean abnormal returns (CAR)

CAR   200 $T = (\mu_1 - \mu_2) / \sqrt{(s_1^2 / n_1) + (s_2^2 / n_2)}$ =(-0.043099-(-0.0917111)/(0.001019-0.002049)=**-47.21041535**

CAR   400 $T = (\mu_1 - \mu_2) / \sqrt{(s_1^2 / n_1) + (s_2^2 / n_2)}$ =(-0.0278–(-0.08394))/(0.001217571-0.001333837)= **-482.848**

CAR   750 $T = (\mu_1 - \mu_2) / \sqrt{(s_1^2 / n_1) + (s_2^2 / n_2)}$ =(0.0107-0.0468686)/(0.000541-0.0015240)=**36.72009**

Note: CAR stands for average cumulative abnormal returns. $T = (\mu_1 - \mu_2) / \sqrt{(s_1^2 / n_1) + (s_2^2 / n_2)}$

Results from the Empirical Study with GARCH Method

Our analysis so far is build up on the assumption that the zero mean disturbance term ,ε_{it}, from the market model, used to measure the normal return , is normally distributed with constant variance σ^2_{it}, i.e., $\varepsilon_{it} \sim N(0, \sigma^2_{it})$. This assumption may not hold since volatility is a commonly observed feature of return series. To overcome this problem we consider heteroskedasticity effects into account.

A new model knows Generalized Autoregressive Conditional Heteroskedasticity GARCH (1, 1) process is introduced to replace the unconditional variance $\sigma^2_{i\,\varepsilon}$ by a conditional variance $h_{it.}$ The time variation is introduced by formulating the disturbance term of the market model as:
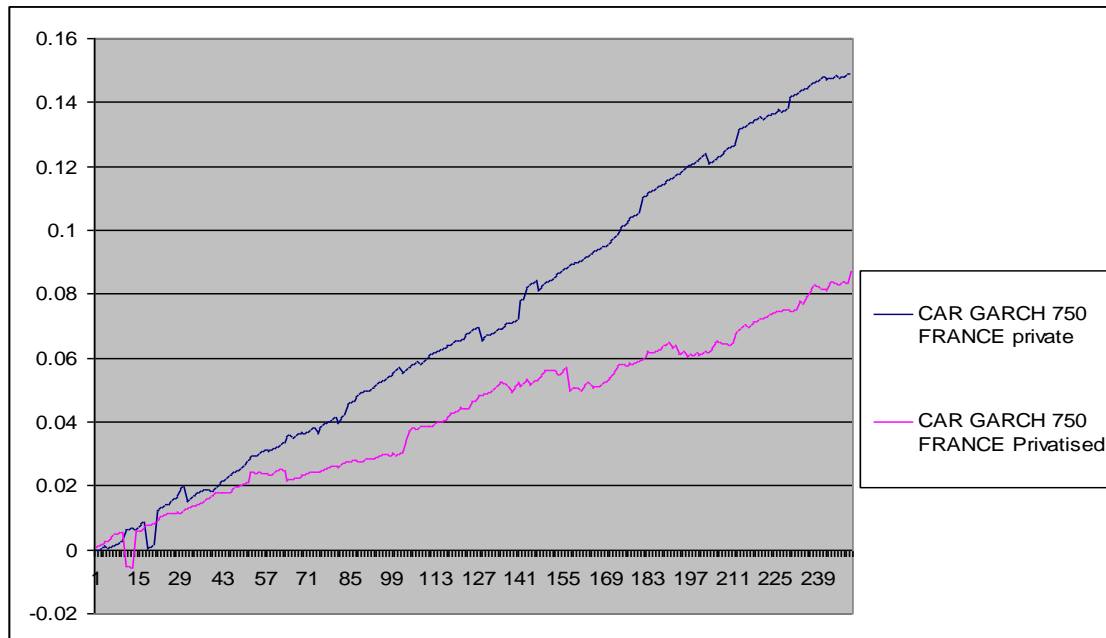
$$\varepsilon_{it} = v_{it} \sqrt{h_{it}}$$

Where $v_{it} \sim N(0,1)$ and

$$h_{it} = w_{i0} + w_{i1} \varepsilon^2_{it-1} + \lambda_{i1} h_{it-1}$$

As the last approach, the results obtained from extending the model to time varying variance of the disturbance term is presented briefly. Figure 2 shows the resulting average cumulative abnormal returns for the estimation window lengths L_3. It indicates that type 1 (private) firms performed somehow better than type 2 (state owned) firms. Private firms' abnormal returns have a significant increase more than privatized firms.

Graph 2: Cumulative Abnormal Return GARCH 750 Days

Contrary to first graph the cumulative abnormal return in graph 2 using Generalized Autoregressive Conditional Heteroscedasticity (GARCH) process, indicates that type 1 (private) firms average cumulative abnormal returns increasing more than type 2 firms. Both two types of firms have positive trend. We need several test statistics to support graphs in statistically way.

Descriptive Statistics GARCH for private and privatised firms from France are presented in Table 10 and 11, respectively.

Table 10: Descriptive Statistics GARCH for private firms from France

Variable and period	Mean	Standard Error	Standard Deviation	Median
AR GARCH 200 Days –France Private	-0.000229727	0.000172983	0.004892692	-0.0000139207
CAR GARCH 200 Days-France Private	-0.179336858	0.00236465	0.066882396	-0.203603526
AR GARCH 400 Days –France Private	-0.000054045	0.0000845781	0.002071732	0.00006.94831
CAR GARCH 400 Days-France Private	-0.016172628	0.000993577	0.024337562	0.000154918
AR GARCH 750 Days –France Private	0.000596297	0.00008.11948	0.001283803	0.00062802
CAR GARCH 750 Days-France Private	0.072179963	0.002856393	0.045163544	0.067076209

Note: AR stands for average abnormal returns, CAR for cumulative average abnormal returns and GARCH for generalized autoregressive conditional heteroscedasticity

Table 11: Descriptive Statistics GARCH for state-owned privatized firms from France

Variable and period	Mean	Standard Error	Standard Deviation	Median
AR GARCH 200 Days –France Privatized	-0.000195077	0.000197819	0.005595172	0.00000215
CAR GARCH 200 Days -France Privatized	-0.135009742	0.002637367	0.074595998	-0.178724236
AR GARCH 400 Days –France Privatized	0.00000952	0.000236103	0.005783318	0.000192403
CAR GARCH 400 Days -France Privatized	-0.07417151	0.001860077	0.045562391	-0.086937647
AR GARCH 750 Days –France Privatized	0.000350293	0.000089604	0.001416775	0.000353648
CAR GARCH 750 Days -France Privatized	0.042559928	0.001477465	0.023360768	0.042559928

Note: AR stands for average abnormal returns, CAR for cumulative average abnormal returns and
GARCH for generalized autoregressive conditional heteroscedasticity

The test statistics carried out on the basis of the standard errors and average abnormal returns of the sample are reported in Table 12 and 13. The test of the null hypothesis that the sample abnormal average return of type 1 firms equals zero yields ; **-18.7812, -12.78, and 201.1245** for L_1=200,400 and 750, respectively. Thus using confidence level α =0.05, we can reject this null hypothesis for type 1 firms for all of the estimation window lengths. For type 2 (privatized) firms the same test statistics yields -13.9461, 0.806231 and 107.061. T tests for privatized firms show that we can reject the null hypothesis for L_1=200 and L_1=750, although for L_1= 400 day estimation window we cannot reject the null hypothesis. As a result of this, H_0, null hypothesis assumption sample abnormal average return is equal to zero is accepted for L_1= 400 day estimation window.

Table 12: Calculated T test for three estimated windows 200, 400 and 750 GARCH
of type 1 and 2 firms

Type 1: Private firms	
T (AAR GARCH 200 Private)=	$\sqrt{200}$ (-0.000229727/0.000172983)= **-18.7812**
T (AAR GARCH 400 Private)=	$\sqrt{400}$ (-0.000054045/0.0000845781)= **-12.78**
T (AAR GARCH 750 Private)=	$\sqrt{750}$ (0.000596297/0.00008.11948)= **201.1245**
Type 2: State –owned firms	
T (AAR GARCH 200 Privatized)=	$\sqrt{200}$ (-0.000195077/0.000197819)= **-13.9461**
T (AAR GARCH 400 Privatized)=	$\sqrt{400}$ (0.00000952 / 0.000236103)= **0.806231**
T (AAR GARCH 750 Private)=	$\sqrt{750}$ (0.000350293 / 0.000089604)= **107.061**

Notes: AAR stands for average abnormal returns and GARCH for generalized autoregressive conditional heteroscedasticity. $T = \sqrt{n}\mu/s$

The average cumulative abnormal returns from T_1+1 to T_2 that is over the entire post estimation window are tested for the two null hypotheses as above, but this time for the GARCH (1,1) process. Under the first null hypothesis the average cumulative abnormal return of the GARCH (1, 1) is equal zero.

Test statistics values for $L_1=200$ of 37.9204, -25.5956 for type 1 and type 2 firms, respectively are found. Similarly based on L1=400, test statistics of -13.2903, and -32.5582 for type 1 and type 2 firms are obtained. Finally for the 750 days estimation window $L_1=750$, test statistics values 43.76826, and 49.89355 are calculated. According to t statistics for the entire estimation window and for both types of firm the null hypothesis can be rejected at confidence level of %5.

Table 13: Calculated T test for three estimated windows 200, 400 and 750 GARCH of type 1 and 2 firms

Type 1: Private firms
T (CAAR GARCH 200 Private)= $\sqrt{200}$ (-0.179336858/0.066882396) = **-37.9204**
T (CAAR GARCH 400 Private)= $\sqrt{400}$ (-0.016172628 /0.024337562)= **-13.2903**
T (CAAR GARCH 750 Private)= $\sqrt{750}$ (0.072179963/0.045163544)= **43.76826**
Type 2: State –owned firms
T (CAAR GARCH 200 Privatized)= $\sqrt{200}$ (-0.135009742/0.074595998)= **-25.5956**
T (CAAR GARCH 400 Privatized)= $\sqrt{400}$ (-0.07417151/0.024337562)= **-32.5582**
T (CAAR GARCH 750 Privatized)= $\sqrt{750}$ (0.042559928 / 0.023360768)= **49.89355**

Notes: CAAR stands for cumulative average abnormal returns and GARCH for generalized autoregressive conditional heteroscedasticity. $T = \sqrt{n}\mu / s$

Second test as carried out for the case of unconditional variance, involves the null hypothesis that the mean sample abnormal return for both of firms is equal. For the three estimation windows, i.e. $L_1=200,400,750$ we detain test statistics values of 1.39512, 0.41949 and 29.2519, respectively. As a result we cannot reject the null hypothesis of equal means of abnormal returns of type 1(private) firms in $L_1=200$ and 400 days estimation window. However, for 750 day estimation window we can reject the null hypothesis.

Table 14: Test of equality of mean average abnormal returns (GARCH)

AAR 200 GARCH	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ =(-0.000229727-(-0.000195077)) / (0.000172983-0.000197819) = **1.39512**
AAR 400 GARCH	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ =(-0.000054045-0.00000952)/ (0.0000845781-0.000236103)= **0.419491**
AAR 750 GARCH	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ = (0.000596297-0.000089604) / (0.0000811948-0.000089604)= **-29.2519**

Notes: AAR stands for average abnormal returns and GARCH for generalized autoregressive conditional heteroscedasticity. $T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$

Further, by testing the null hypothesis that the mean sample of GARCH cumulative abnormal return for both types of firms is equal, we obtain values of 162.5389, -66.9347 and 21.48047, respectively for three estimated windows of 200, 400 and 750 days.

Table 15: Mean CAR equality test (GARCH)

CAR 200 GARCH	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ =(-0.179336858-(-0.135009742) / (0.00236465-0.002637367)= **162.5389**
CAR 400 GARCH	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ =(-0.016172628-(-0.07417151)) /(0.000993577-0.001860077)= **-66.9347**
CAR 750 GARCH	$T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ =(0.072179963-0.042559928)/(0.002856393-0.000089604) = **21.48047**

Notes: CAR stands for average cumulative abnormal returns and GARCH for generalized autoregressive conditional heteroscedasticity. $T = (\mu_1 - \mu_2)/\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$

CONCLUSIONS

In this paper, empirical studies looking at the comparative performance of public and private sectors and privatisation performance came under consideration through the use of a case study of France. Financial performance of both private and state-owned enterprises is investigated through looking at results since the outbreak of the intensive privatisation programmes in France at the end of the 1980s. There are numerous studies, looking at different aspects of the relationship between public and private sector, and using different methods with different criteria. The results of those studies showed a mixed picture; some indicating the superiority of the private sector over the public, and some the reverse. Most of these studies

used the conventional way of measuring corporate performance, as suggested by the neoclassical approach.

This study focused on the change in the allocative efficiency of privatised firms in France over the period 1987-2012. The pre-and-post privatisation performance is being tested using method known as 'event study' involving using share prices of the private and privatised firms and calculating returns to measure the financial performance on the basis of cumulative excess returns. The cumulative abnormal returns of the privatised firms are compared to those firms that experienced an IPO during the same period. The result including a conditional method of heteroscedasticity known as GARCH (1, 1) shows that the abnormal returns of the privatised firms are significantly different from those of the regular IPO firms. These results are along the lines of some international studies briefly presented in the literature review.

Comparing the international results to the results we have found in this study, it can be concluded that the overall results of this study is in the line with only some of those studies. The French enterprises did change after privatisation, similar to that in other countries; only few cases have shown not significant results. We offer two reasons for this: the fact is that the privatisation program in France hardly involved full privatisation, and the state influence was still strong after partial privatisation.

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