

Florio, Massimo; Manzoni, Katiuscia

**Working Paper**

## The abnormal returns of UK privatisations: From underpricing to outperformance

Nota di Lavoro, No. 83.2002

**Provided in Cooperation with:**

Fondazione Eni Enrico Mattei (FEEM)

*Suggested Citation:* Florio, Massimo; Manzoni, Katiuscia (2002) : The abnormal returns of UK privatisations: From underpricing to outperformance, Nota di Lavoro, No. 83.2002, Fondazione Eni Enrico Mattei (FEEM), Milano

This Version is available at:

<https://hdl.handle.net/10419/119689>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

Fondazione Eni Enrico Mattei

**The Abnormal Returns of  
UK Privatisations:  
From Underpricing to  
Outperformance**

Massimo Florio and Katiuscia Manzoni  
NOTA DI LAVORO 83.2002

**OCTOBER 2002**

PRIV – Privatisation, Regulation, Antitrust
---

Massimo Florio, Department of Economics, University of Milan  
Katiuscia Manzoni, City University Business School, London

This paper can be downloaded without charge at:

The Fondazione Eni Enrico Mattei Note di Lavoro Series Index:

[http://www.feem.it/web/attiv/\\_wp.html](http://www.feem.it/web/attiv/_wp.html)

Social Science Research Network Electronic Paper Collection:

[http://papers.ssrn.com/abstract\\_id=XXXXXX](http://papers.ssrn.com/abstract_id=XXXXXX)

The opinions expressed in this paper do not necessarily reflect the position of  
Fondazione Eni Enrico Mattei

# **The Abnormal Returns of UK Privatisations: From Underpricing to Outperformance**

## **Summary**

This paper offers a review and discussion of the evidence concerning the underpricing and long run performance of British PIPOs (Privatisation Initial Public Offerings) between 1977-1996, i.e. from the first privatisation under a Labour Government (British Petroleum), until the last ones by a Conservative Government (Railtrack). We exclude more recent years because the change of government, the introduction of a windfall tax on excess profits of regulated utilities, and changes in the regulatory regime, mark a totally different landscape as compared with the previous twenty years. We find evidence that underpricing was not followed by underperformance, as is usually observed with IPOs, but rather strong outperformance. We decompose this trend by subgroups within a 55 observations sample, and conclude that lax regulation was probably the main driving force between abnormal returns of British PIPOs.

**Keywords:** Privatisation, regulation, abnormal returns

**JEL:** H32, G14, L33

*The research was made possible by generous research funds awarded to the Department of Economics, University of Milan by the Italian Ministry of University (MURST 40% funds) in the framework of a more general study on the changing role of public services in Europe.*

*Address for correspondence:*

Massimo Florio  
CSIL Centro Studi Industria Leggera  
Corso Monforte 15  
20122 Milano  
Phone: 02-796630  
Fax: 02-780703  
E-mail: [massimo@csilmilano.com](mailto:massimo@csilmilano.com)

## *1. Introduction*

This paper presents some new evidence concerning the underpricing and long run performance of British PIPOs (Privatisation Initial Public Offerings) between 1977-1996, i.e. from the first privatisation under a Labour Government (British Petroleum), until the last ones by a Conservative Government (Railtrack). We exclude more recent years because the change of government, the introduction of a windfall tax on excess profits of regulated utilities, and changes in the regulatory regime, mark a totally different landscape as compared with the previous years. We use a large sample of 55 PIPOs, and monthly data over 20 years. This allows us to test our data and to decompose them in subsamples by a set of possible relevant variables. Our results points definitively to a combination of underpricing and outperformance, in contrast with the expectation, usual in finance literature, that abnormal returns should disappear in the long run.

It is well known that in general IPOs are associated with a certain degree of underpricing, but PIPOs tend everywhere to show higher immediate abnormal returns (Megginson, Netter, 2001). Moreover, while usually in the long-run the initial abnormal returns are corrected by underperformance, we wish to test whether this happened in the case of the UK.

In financial literature the causes for underpricing are traced back to different theories:

- Principal-agent theory: it is assumed that the financial intermediaries (underwriters) know the market better than the firm (principal) and are interested in undervaluing the firm to minimise their sales effort and to maximise the probability of success.
- Information asymmetry: it is assumed that the subscribers are split into one more informed and one less informed group. The latter subscribes to all IPOs, while the former subscribes only when a positive initial return is expected. In general IPOs have to be underpriced in order to attract the more informed investors. The greater the uncertainty about the value of the firm, the greater the underpricing.
- Reputation building: underpricing could be a way of indicating the determination of the issuer to attract prestigious underwriters. The subject comes up again when the sale is conducted in tranches: the firm indicates that it has the financial strength to allow itself an initial underpricing which will be recouped in the subsequent placements;

- Investor sentiment: there may be irrational elements in the behaviour of the markets, in particular excessive optimism, which is revealed after the placement, generating an initial underpricing which then culminates in underperformance in the longer term;

Less clear are possible reasons for long-run abnormal returns. According to the efficient market hypothesis returns should converge in the long-run, and systematic outperformance may seem to contradict a standard theory of finance. Different theories have been advanced to explain abnormal returns, particularly by behavioural finance literature.

Perotti and Oijen (2000) points to a shift in expectations as a possible explanation for abnormal returns in the long run: while at placement time investors fear a political risk of expropriation, at a later stage they realize that such a risk does not materialize. Thus in earlier stages excess returns of privatized companies may include a risk premium.

While we cannot test all these theories, we suggest that in the case of British PIPOs another explanation (not necessarily an alternative one) is that in earlier years privatisation is accompanied by lax regulation, and this allows for excess returns. The expectation of high returns drives higher share prices. When this process become too visible, end or there is a change of political environment, regulators start squeezing the regulatees. But this process may take considerable time. We wish to understand a) whether our data support the existence of abnormal returns in the long run for UK PIPOs, b) what they tell us about possible explanations.

The paper has the following structure: first we present some background information on the financial size of the privatisation programme in the UK, second we discuss previous reseach on underpricing, and – third – on abnormal returns in the long-run, fourth we present our findings, and eventually our conclusions.

## *2. Background*

At the end of 1997 a total of 43 major firms had been privatised in the UK by fixed price offer or tender, with 55 separate sales transactions (due to some cases of placing in tranches). In fact the

transactions were grouped into 30 offers (since in some cases, for example the RECs, placing occurred simultaneously). The estimated nominal proceeds from privatisation were over £70 billion (Curwen, Hartley, 1997; Martin, Parker, 1997). Our own data are presented in table 1.

Table 1 presents detailed information about the single privatisation issues, which is mainly taken from Price Waterhouse publications. Specifically we present the name of the firm, its industry sector, the first trading day, net proceeds for the government (at 1995 prices), offer price, percentage of equity sold (size of the offer) and method of sale.

The individual participation by the public varied from a minimum of 8,000 subscribers for ABP to a maximum of 4.5 million for British Gas (1986). Roughly half the proceeds for the Exchequer came from institutions and half from the public, with a claw-back mechanism which envisaged that if a certain threshold of subscriptions from the public were exceeded, then the quota reserved for institutions would be diminished. In 29 cases the public was allowed to pay in two or three instalments, the first being only £100. There was also in some cases a loyalty bonus of one free share for every 10 or 15 purchased for those who kept their shares for a year. The bonus for some utilities was doubled if the purchasers were their own customers.

Employees were frequently offered free shares in addition to those reserved for them, at times at reduced prices. This incentive was, on the other hand, rarely worth more than £500.

About 40 other firms were sold in the form of trade sales, without being placed on the stock exchange, but by means of direct negotiation. There were also over 200 buy outs, the majority of them management buy-outs, but there were also a number of employee buy-outs (the most famous case was that of the National Freight Corporation).

In the rest of this paper we shall concentrate on public offerings.

**Tab.1 Privatised Firms: Dates, Industry Sector, Proceeds, Prices and % of equity sold**

Company Name	Industry Sector	First Trading Day	Proceeds at 1995 Prices	Offer/Tender Price	Offer_Rate	Method of Sale
Aea technology	BUSINESS SUPPORT	26-Sep-96	224.0	280	NA	NA
Amersham International plc	CHEMICALS	25-Feb-82	124.0	142	100	O
Anglian Water	WATER	12-Dec-89	NA	240	98.4	NA
Associated British Ports plc (I)	TRANSPORT	16-Feb-83	83.3	112	51.5	O
Associated British Ports plc (II)	TRANSPORT	19-Apr-84	83.9	270	48.5	O
British Aerospace plc (I)	MANUFACTURING	20-Feb-81	91.2	150	51.6	O
British Aerospace plc (II)	MANUFACTURING	14-May-85	542.2	375	59	O
British Airports Authority (BAA) plc	TRANSPORT	28-Jul-87	1697.2	245	95.6	O
(I) British Airports Authority (BAA) plc	TRANSPORT	28-Jul-87	1697.2	290	95.6	T
(II) British Airways plc	TRANSPORT	11-Feb-87	1262.2	125	97.5	O
British Energy	ENERGY	15-Jul-96	653.3	198	87.8	O
British Gas plc - sales of shares	ENERGY	8-Dec-86	7568.0	135	96.6	O
British Petroleum plc (I)	ENERGY	10-Jun-77	NA	845	49	O
British Petroleum plc (II)	ENERGY	12-Nov-79	691.7	363	5.2	O
British Petroleum plc (III)	ENERGY	26-Sep-83	940.3	435	7.2	T
British Petroleum plc (IV)	ENERGY	30-Oct-87	6998.7	330	36.8	O
British Steel plc	STEEL	5-Dec-88	3151.5	125	100	O
British Telecom plc (I)	TELECOMMUNICATIONS	3-Dec-84	5819.2	130	50.2	O
British Telecom plc (II)	NS TELECOMMUNICATIONS	10-Dec-91	5597.0	335	25.9	O
British Telecom plc (III)	NS TELECOMMUNICATIONS	19-Jul-93	5457.2	410	20.7	O
Britoil plc (I)	NS ENERGY	23-Nov-82	1112.4	215	51	T
Britoil plc (II)	NS ENERGY	12-Aug-85	665.6	185	59	O
BTG	BUSINESS SUPPORT	6-Jul-95	NA	195	NA	NA
Cable and Wireless plc (I)	TELECOMMUNICATIONS	6-Nov-81	350.8	168	49.4	O
Cable and Wireless plc (II)	NS TELECOMMUNICATIONS	5-Dec-83	455.4	275	22.3	T
Cable and Wireless plc (III)	NS TELECOMMUNICATIONS	13-Dec-85	901.6	587	31.1	O
east midland electricity	NS ELECTRICITY	11-Dec-90	523	240	97.5	O
eastern electricity	ELECTRICITY	11-Dec-90	648	240	97.6	O
Enterprise Oil plc	ENERGY	2-Jul-84	631.8	185	100	T
jaguar	AUTOMOBILES	10-Aug-84	294	165	100	O
london electricity	ELECTRICITY	11-Dec-90	523	240	97.5	O
manweb	ELECTRICITY	11-Dec-90	285	240	97.5	O
midlands electricity	ELECTRICITY	11-Dec-90	503	240	97.7	O
national power (I)	ELECTRICITY	12-Mar-91	2,231	175	60.9	O
national power (II)	ELECTRICITY	6-Mar-95	NA	476	38.3	O
norther electric	ELECTRICITY	11-Dec-90	295	240	97.5	O
Northern Ireland Electricity	ENERGY	18-Jun-93	725.8	100	96.5	O
northumbrian water	WATER	12-Dec-89	157	240	98.4	O
norweb	ELECTRICITY	11-Dec-90	415	240	98.4	O
power gen (I)	ELECTRICITY	12-Mar-91	1,367	175	59.5	O
power gen. (II)	ELECTRICITY	6-Mar-95	NA	512	36.6	O
Railtrack	TRANSPORT	20-May-96	2235.7	380	98	O
Rolls-Royce plc	MANUFACTURING	20-May-87	1485.2	170	96.7	O
scottish power	ELECTRICITY	18-Jun-91	1,956	240	96.4	O
seeboard	ELECTRICITY	11-Dec-90	306	240	97.5	NA
severn trent	WATER	12-Dec-89	849	240	98.4	O
south wales el.	ELECTRICITY	11-Dec-90	244	240	97.5	O
south western el	ELECTRICITY	11-Dec-90	295	240	97	O
southern elec	ELECTRICITY	11-Dec-90	648	240	97.5	O
southern water	WATER	12-Dec-89	392	240	98.4	O
TSB	BANKS	10-Oct-86	1,360	100	NA	NA
thames water	WATER	12-Dec-89	922	240	97.4	O
welsh water	WATER	12-Dec-89	346	240	98.4	O
wessex water	WATER	12-Dec-89	246	240	98.4	O
yorkshire el.	ELECTRICITY	11-Dec-90	497	240	97.5	O

### 3. Underpricing

One business source explains the advantages of shares in privatised firms as the following: “Why should privatizations be good investments?” The answer is, because

“governments frequently provide state enterprises with a ‘dowry’ of debt write-off or other financial support before launching them in the private sector; and when the launch is made they provide a fair wind by insuring that the price is not too demanding ... Government owned companies have dominant market positions (and) because of their size may be less risky than some other investments... a composite index of privatized stocks showed a rise of over 165% between the beginning of 1989 and end of 1992: this compares with 65% for the S&P 500 index” (Privatization International Yearbook 1994).

The great attraction of the shares of privatised firms is thus seen as their initial underpricing and the monopoly power that the Government grants when privatisation is only partially and gradually accompanied by liberalisation.

Other authors admit that underpricing occurred, but claim it was limited: Boyfield (1997), in his apology of British privatisations, observes that a premium of 12% is typical for new private issues, and that in the case of British privatisations it even reached 45%, which was extremely high (on the other hand it is not totally clear how the author calculated this), but in some ways inevitable.

In part, according to some authors, underpricing is the cost of a strategy: that of encouraging those that are not very informed to buy shares<sup>1</sup>. Boyfield also observes, with unintentional wit, that “The city was disinclined to participate in tender sales” (that is in competitive procedures aimed at minimising underpricing). But was the City really less informed than the British Government about the potential of telecommunications or electricity?

This point can be examined empirically. Here we shall confine ourselves to the question of underpricing, that is of the immediate capital gain, and we shall deal with the longer term gains in a subsequent section.

The subject of underpricing had already been raised by Vickers, Yarrow (1988) on the basis of their observations of the first privatisations of the Thatcher government<sup>2</sup>.

---

<sup>1</sup> Rock (1986) says: “to attract uninformed a discount is necessary”.

<sup>2</sup> In Table 5 (page 19) their references are the offer for sale price and the one recorded 24 hours later, at the end of the first day of trading.



In the 15 cases they studied the unweighted average underpricing was in the region of 19%. The average weighted by the amount of undervaluation was higher, thanks to the considerable weight of BT, which recorded a price difference of 33% after the first trading day on the first tranche offered (subsequent tranches were less underpriced).

The same authors show that for privatisations based on tender offers (ABP, BAA, BP, Britoil, C&W, Enterprise Oil) underpricing was nil<sup>3</sup>: in these cases the operators were able to accurately assess the company value.

The same authors also use a calculation of the immediate profit in the case of sales by tranches, finding that in these cases the percentage gain was higher on the first tranche.

This calculation should then be integrated with a series of additional benefits reserved for certain categories of purchasers. For example in the case of BT and BG those purchasing shares also received a voucher (£40 for BG) for each 400 shares. We have already mentioned that in many cases there was one free share for every ten or fifteen purchased as a loyalty bonus, etc.

Not surprisingly at these conditions the price could not ration demand, which was in fact often a multiple of the value of the shares offered: e.g. 32 times for BA, 35 times for ABP, as an extreme case, but for the privatisations of the 80's in the form of offers for sale demand was typically 7-8 times greater than supply, having excluded extreme cases<sup>4</sup>.

---

<sup>3</sup> On the contrary there were two cases of overpricing.

<sup>4</sup> Other indications of the difference in price after the first day can be found in Hayri, Hilmaz (1997, tables 1-2)

**Table 2 – Internal rate of return (IRRs) from shares held until 1<sup>st</sup> May 1997, and for shares bought on 1<sup>st</sup> May 1997**

	Real * IRRs			
	a	b	c = b-a	c/a
Bought:	at initial sale	after 1 day's trading	difference	% difference
Sold:	On 1/5/97**	On 1/5/97**		
BT - tranche 1	14	10	-4	-29
- tranche 2	12	9	-3	-25
- tranche 3	8	5	-3	-38
British Gas	11	8	-3	-27
BAA	16	13	-3	-19
Anglian Water	21	16	-5	-24
Northumbrian	35	27	-8	-23
North West Water	22	17	-5	-23
Severn Trent	23	18	-5	-22
Southern Water	29	24	-5	-17
South West Water	22	17	-5	-23
Thames Water	21	17	-4	-19
Welsh Water	24	19	-5	-21
Wessex Water	23	17	-6	-26
Yorkshire Water	22	18	-4	-18
Eastern Electricity	42	34	-8	-19
East Mids Electricity	34	27	-7	-21
London Electricity	32	26	-6	-19
Manweb	38	29	-9	-24
Midlands Electricity	40	32	-8	-20
Northern Electricity	36	30	-6	-17
NORWEB	44	35	-9	-20
SEEBOARD	45	38	-7	-16
Southern Electric	32	25	-7	-22
SWALEC	40	31	-9	-23
SWEB	41	32	-9	-22
Yorkshire Electricity	35	27	-8	-23
PGen- tranche 1	29	23	-6	-21
- tranche 2	16	15	-1	-6
NPower- tranche 1	30	23	-7	-23
- tranche 2	23	21	-2	-9
ScottishPower	14	10	-4	-29
Scottish Hydro	14	10	-4	-29
N. Ireland Electricity	23	17	-6	-26
Railtrack	87	75	-12	-14
British Energy	25	31	6	24
AVERAGE (unweighted)	28	22	-6	-20

Source:.) Our calculations based on

Notes:

\* the IRRs are calculated from “real” cash flows adjusted in line with the RPI. The IRRs shown are therefore the annual percentage returns received over and above the rate of inflation. The returns shown are gross. Investors may be liable for income tax and/or capital gains tax.

\*\* or at takeover, if earlier.

Cawthron (1999) calculates the internal rate of return of 38 placements up to 1997.

Table 2 shows the return for the holder of a share at May 31<sup>st</sup>, 1997 assuming that the share was purchased at the issue price or on the secondary market 24 hours later. The difference between the two rates gives us an idea of the underpricing. The absolute difference in the real IRR varies from a minimum of 3-4 points to over 10 (on average 5.7 points). In percentage terms, compared to the IRR for those who purchased on the secondary market, the average unweighted difference between purchase on placement and purchase 24 hours later is 25% higher for those who did buy at placement.

When faced with such a sizeable underpricing phenomenon one must look into the causes and ask oneself whether this spread is specifically related to privatisations or to the fact that they were large IPOs, in sectors and at times that were particularly vulnerable to underpricing.

Levis (1993) examines 712 IPOs in the UK over the period 1980-88, roughly the same period as that studied by Vickers and Yarrow (1988) and finds that the average abnormal adjusted return after 24 hours is 14.3%.

The following measure was used:

“The first day adjusted return for issue is defined as the percentage change in price from the offering date to the close of the first day of trading ( $r_i$ ) less the equivalent change in an appropriate benchmark ( $r_m$ )

$$ar_i = r_i - r_m$$

The benchmark used is the daily weighted FTA index. It should be noted that although not great in numerical terms, the 12 privatisations considered in the sample account for 76% of the total new equity capital collected through IPOs on the London market between 1980 and 1988<sup>5</sup>.

Compared to an average value of abnormal returns for IPOs of 14.3%, these privatisations recorded 37.25%. All the other sectors were well below 20%, with the sole exception of “publishing and printing” (24.63%).

We may therefore assume that *excess* underpricing specifically attributable to the first vintage of privatisations was in the region of 23%.

A recent work (Huang, Levich, 1999), allows us to corroborate these results and examine possible explanations. The study is an international one (36 countries), covering the period 1979-1996, and it deals with 330 IPOs and 177 seasoned public offerings, with an income for the sellers of US\$ 352 billion. The sample includes 57 privatisations in the UK. The index for the return is not adjusted by the benchmark of the market, nor by the special conditions offered to certain categories of purchasers. This gross return is taken as the dependent variable, considered as a proxy for underpricing and then regressed on a set of possible explanatory variables, such as the volatility of prices prior to the offer, the price trends in the previous month, those of the offer, a dummy if the controlling share is sold (50% or more of capital), the percentage offered to the foreign sector, a Gini index of income distribution, and others. The attempt is to verify various possible hypotheses of the causes of underpricing.

Here we are less interested in this tentative explanation, than in determining the empirical values of underpricing. The international sample of 297 transactions related to privatised firms shows an immediate unadjusted return of 25.6% on average (with a median around 10%), which becomes 32.1% for the 220 IPOs, while the return on seasoned offerings is only 7.17%. The difference is statistically

---

<sup>5</sup> The twelve cases include: BAerospace, C&W, Amersham, ABP, Jaguar, BT, BG, BA, Rolls Royce and BAA.

significant at the 95% level, which is seen as confirmation of the theories of “reputation building” and “information asymmetry” (even though the first interpretation seems more convincing)<sup>6</sup>.

As regards the 42 cases of British PIPOs the authors find an immediate return of 17.7%, while for a sample of 2,133 IPOs in the UK the average is 12% (11.5% referring to another sample). The difference in return is between 5.7% and 6.2% and is 99% statistically significant.

Basically, these results confirm that there is a noticeable difference between underpricing for privatisations and ordinary underpricing in the case of the UK<sup>7</sup>.

Other papers that analyse British PIPOs include Menyah and Paudyal (1996), who find market-adjusted immediate returns of 39,6% for 40 UK PIPOs (1981-1991); Denwenter and Malatesta (1997), who find mixed results; Choi and Nam (2000); Jones, Megginson, Nash, and Netter (1999), the latter being international comparison studies.

#### *4. Abnormal returns in the long term*

We want now to verify whether underpricing was corrected in the longer term through *negative* abnormal returns, or rather whether it was frozen at an initial level or amplified by positive abnormal returns.

International empirical literature shows that with ordinary IPOs, subsequent negative abnormal returns correct the excessive reaction of the market.

Levis (1993) observes that:

“The empirical evidence accumulated during recent years for almost every capital market in the world, is unequivocal in its conclusion that initial public offerings (IPOs) provide significant abnormal returns on their first day of trading... the literature is almost unanimous in its conclusion that their presence constitutes evidence of deliberate underpricing”.

The same author quotes a series of empirical studies that show evidence of underperformance in the long term in the USA, Germany, Brazil, Mexico, Chile and Finland and he proposes verifying whether the case of the UK confirms these results. The author’s conclusion is that for a period of 36 months there is evidence of underperformance also in the case of the UK.

---

<sup>6</sup> Cf. the international comparisons and interpretation given by Perotti, Guney (1993).

<sup>7</sup> This is not so in other countries: for a recent review of international evidence cf. Megginson, Netter (2001).

The test that he uses is simply an extension of the index already given for the return after 24 hours, to include the difference between the return at 36 months from the IPO and a benchmark index (without any risk adjustment)<sup>8</sup>.

While the author is mainly interested in showing underperformance in the case of the UK for the IPOs as a whole, we are more interested in the case of privatised firms.

The result<sup>9</sup> is that after three years while the cumulated abnormal return of the IPOs as a whole was 55.72%, that of the privatised firms was almost double: 96.91%. Even more interestingly, while the ratio with the benchmark indices was lower than 1 for all three benchmarks for the sample as a whole (712 cases), in the case of privatisations it was well above 1 for the FTA and HGSC indices, and marginally lower than 1 for the ASEW index.

Given the size of the privatised firms, we think that the comparison with the FTA index seems definitely the most relevant. This gives us a significant deviation: 1.157 for the privatised firms compared to 0.958 for the IPOs as a whole (obviously less if the comparison is made without the privatised firms).

A specialist source, the Investor Chronicle (1994), observed that in the space of ten years privatised firms, which at the time capitalised £145 billion or 20% of the total value of the share market, recorded an average increase in price of 276% (not corrected by dividends). A strategy of buy and hold for the 49 stocks considered, with an outlay of £100 per security, would have led to a cumulative outlay of £4,900 to achieve a value of £18,400 in 1994.

According to a study by the London Business School quoted by the same source, a strategy of buy and hold beginning in July 1981 would, by 1988 (October), have generated a capital gain of 166%, compared to the 77% of the FTA All-Share Index. Purchasing the same shares and selling them after one week would, however, have given a profit of 32%. These performances are better even than those of the best international investment funds, at least for categories of equivalent risk<sup>10</sup>.

Cawthron (1999) offers a different, but convergent, approach. He considers the real internal rate of return after the first day and compares it with the FTSE All-share Index. The performance is then calculated at 31/5/97 for all shares: with the exception of BT, there is ample evidence of returns far higher than the benchmark index. In the case of the 12 RECs the difference is 17 points on average; in

---

<sup>8</sup> Since the long term returns are sensitive to the benchmark used, in addition to the FTA (which covers 650 stocks accounting for 90% of the value of the stock market) the author also uses another index (Extended Hoare Govett Smaller Companies) which includes smaller companies than those in the FTA. A third index is also used (All Share Equally Weighted) which moved much faster than the FTA and the HGSC in the period 1980-88.

<sup>9</sup> Cf. Levis (1993), tab 11, p. 39

<sup>10</sup> The hypothesis that the "beta" coefficient is in the region of 1 for the shares of UK privatised firms seems realistic.

the case of the 10 Water authorities the average difference is 12 points. One notices that the IRR of the FT index between 1984 and 1996 was, in real terms, an average of over 15%, which is undoubtedly high both in historical terms and by international comparison. Thus the abnormal returns of privatised companies in fact exceed a stock exchange performance which was in itself very good.

Other estimates are given by L. Channells (1997).<sup>11</sup> Still using the FTSE All Share Index, the abnormal returns calculated are reported in Tab. 3

Other studies on abnormal performance in the long run include Menyah, Paudyal, and Inganyete (1995), who find for the ten-years-period 1981-1991 that a sample of 40 UK PIPOs over 80 weeks show a market adjusted return ten times higher than private sectori IPOs (33% against 3,5%). Megginson, Nash, Netter, Schwartz (2000) find that a buy and hold strategy for 158 PIPOs in 33 countries, pays very high return worldwide after 5 years

Thus according to previous studies, there is clear international evidence that PIPOs outperform the market, more than private sector IPOs, and there is also some evidence that the UK is not an exception in this privatisation worldwide bonanza.

We wish to test this evidence with a new set of data and with a decomposition of aggregate evidence by selected variables.

**Table 3 - Abnormal returns calculated for some sectors**

Firm	100 days	1 year	4 years
Water	31	58	93
Electricity (RECs)	26	23	124
Electricity (Generation)	28	27	109
BT	51	52	18
BG	10	22	32
BAA	43	39	69
Railtrack	3	15	na

Source:Adapted from Channels (1997)

## 5. Findings

### 5.1 Data

The sample used in this work includes 55 privatisation offerings occurred in the United Kingdom over the period 1977-1996. The sample comprises the allocation of both majority stakes and minority stakes. First issue share offerings (Primary offer, P) and secondary issue share offerings (Secondary offer, S) are also included in the sample. In the latter case, the initial offer is followed by one or more seasoned offers. Prices series have been collected from *Datastream International Ltd*, while we referred

<sup>11</sup> "The Windfall Tax", in *Fiscal Studies*, no. 18, p. 281.

to *Company Analysis* for accounting information about the sample firms. The accounting data refer to the last balance sheet date prior to the privatisation event, when possible, and to the same day of the privatisation event otherwise (i.e. in case the firm was not previously listed on the stock exchange).

## 5.2 Methodology

The methodology we employed in this study is the standard event study approach and is totally consistent with the methodology used in Levis (1993) to analyse the performance of UK initial public offerings (IPOs). Three different performance measures have been calculated for each privatization offering (either primary or secondary):

a) The first day abnormal return ( $ar_i$ ) for each individual issue  $i$  is defined as the percentage change in price between the offering date and the close of the first trading day<sup>12</sup> ( $r_i$ ) less the equivalent change in an appropriate benchmark (FTSE All Share) occurred over the same time period ( $r_m$ ):

$$ar_i = r_i - r_m \quad (1)$$

b) The first month *abnormal return* ( $ar_{it}$ ) for each issue  $i$  is defined as the return from the offering price to the last calendar day of the first trading month ( $r_{it}$ ) less the equivalent benchmark return (FTSE All Share) ( $r_{mt}$ ). As a consequence the time interval over which returns have been computed varies from 1 to 30 calendar days, according to the day of the month on which the privatisation actually occurred.

$$ar_{it} = r_{it} - r_{mt} \quad (2)$$

c) The long-run return (from 2 to 10 months) is computed using monthly prices and is based on prices at the last day of the month on which the stock is traded. These prices are not adjusted for *splits*, *rights* or *scrip offerings*. For each issue  $i$  the monthly *abnormal return* ( $ar_{it}$ ) from the second trading month is computed as follows:

$$ar_{it} = r_{it} - r_{mt} \quad (3)$$

---

<sup>12</sup> Prices at the first and at the last trading day of the first trading month have been downloaded from *Datastream International* as *unadjusted prices* (UP). In this case, the closing price has not been historically adjusted for bonus and rights issues and it therefore represents actual or "raw" price as recorded on the day. All the other prices, that is the monthly closing prices from the second trading month on have instead been collected as *adjusted prices*, i.e. they have been adjusted for the factors mentioned above.

where  $r_{it}$  and  $r_{mt}$  are the monthly return in month  $t$  for the firm  $i$  and for the market, respectively.

To allow comparisons with previous empirical findings we use the same measures of long-run performance as Ritter (1991) and Levis (1995). Thus, the average abnormal return ( $AR_t$ ) on a portfolio of  $n$  firms for month  $t$  and adjusted for the market performance is computed as follows:

$$AR_t = \frac{1}{n} \sum_{i=1}^n ar_{it} . \quad (4)$$

The cumulative abnormal return ( $CAR_{1,s}$ ) from the beginning of the first full calendar month of trading to every month  $s$  is the sum of the average abnormal returns ( $AR_t$ ):

$$CAR_{1,s} = \sum_{t=1}^s AR_t . \quad (5)$$

The statistical significance of CARs is assessed by a simple *t-statistic* computed for each period as follows:

$$t(CAR_t) = \frac{CAR_t}{S.E.(CAR_t)} \quad (6)$$

where  $S.E.(CAR_t)$  is the standard error of the average cumulative abnormal return on period  $t$  and  $t(CAR_t)$  is the *t-statistic* (with 2 degrees of freedom) for the null hypothesis that  $CAR_t$  is equal to zero.

As far as the underpricing analysis, the degree of underpricing is measured by the percentage change in the offer price and the closing unadjusted price on the first trading day. Descriptive statistics and correlation coefficients between the underpricing and accounting and issue-specific variables (firm size, net proceeds, method of sale, etc.) are reported in Table 4. Table 5 shows the coefficient estimates from the linear regression of the underpricing on the same explanatory variables presented in Table 4. All the coefficients appear to be statistically significant as indicated by the respective *t-statistic* (with asterisks indicating the significance level). We also report the  $R^2$ , *Adjusted R<sup>2</sup>* and *F-test* of the regression as general indicators of the goodness of fit of the model. The variables that result to be helpful in explaining the underpricing are firm size on the day of the privatisation (SIZE), the return on



the capital employed (ROCE), the percentage of shares sold out (OFFER\_RATE), the firm leverage or indebtedness (DEBT\_EQUITY), the method of sale (O\_T), and a dummy equal to 1 if the offer is primary, and 0 otherwise. All the remaining variables presented in Table 6 have been excluded from the regression as not significant at the 0.1 level.

As described above, the short-run performance of the UK privatised firms is measured in terms of average abnormal return on the first trading day (1<sup>st</sup>-dayAR). The long-run performance is measured by average CARs computed over 1, 2, 3, 5, and 10 years after the privatisation. Following the methodology of Levis (1993), we have studied the first day return and the long-run return according to various aspects we are particularly interested, that is method of sale, percentage of equity sold, year of privatisation, industry sector and firm size. The objective is to capture possible and significant differences between groups. Table 3 shows the results for the whole sample (*Panel A*) and results as from the analysis of various subsamples (*Panel B-H*) with respective *t-test* for significance.

### 5.3 Results

#### *Underpricing*

The average underpricing computed over the whole sample of privatised firms (55 observations) appears to be approximately 13% and shows to be significantly and negatively correlated with size (ASSETS, SALES and CAPITAL EMPLOYED), profitability (ROCE), leverage (TOT\_DEBT), liquidity (QUICK) and number of directors (Table 7). Moreover, the underpricing is negatively correlated with the level of net proceeds from the privatisation offering (*proceeds*). We can interpret this variable as a measure of the *ex-ante* uncertainty about the new offerings. A lower level of proceeds may indicate a greater uncertainty about the future prospects of the firm, and a negative relationship between this variable and the degree of underpricing would be consistent with our expectations. Finally, it emerges that the underpricing is not the result of a general increase in the stock market returns (in the period between the last offer day and the first trading day). This hypothesis is indeed strongly rejected by a statistically non significant coefficient both in the univariate analysis (correlation coefficient) and in the multivariate analysis developed below.

Within a multivariate perspective, the results from the cross-section regression presented in Table 8 show that the underpricing decreases as i) firm size increases; ii) leverage becomes larger; iii) profitability rises; and iv) the equity stake sold increases. Moreover, the level of underpricing is significantly higher in the case of primary offers than for secondary offers, and for public offers respect to tender offers. As we expected the underpricing is larger for smaller firms, which may be explained in terms of asymmetry information about the firm value. In addition, the lower the percentage of equity offered, the higher the liquidity risk and the larger is therefore the underpricing that investors require for taking this risk. The linear model we have used explains approximately 73% of the variations in the underpricing (dependent variable) and the *F-test* is able to reject the null hypothesis that all of the slope coefficients (excluding the constant, or intercept) in the regression are zero.

We have investigated also the possibility that some of the discount factors (i.e. liquidity) explaining the underpricing may decrease over time. We have tested this hypothesis testing for the presence of a negative trend in the average underpricing (Table 4). We were able to reject the hypothesis, but we cannot exclude that this result is due to the small number of observations in each year except for the years 1989 and 1990.

#### *Cumulative Abnormal Returns (CARs)*

The cumulative abnormal return computed over the whole sample appears to be significantly different from zero starting from the first 3 months after the privatisation ( $CAR_{3M}=14.5\%$ ). CARs seem also to increase over time reaching 21% after 1 year, 42% after 3 years, and 57.3% after 5 years. After 6 years from the privatization date, CARs seem to reverse their trend and decrease to 38.5% at the end of the tenth year (Table 6). Due to the small number of observations, we cannot analyse the CARs behaviour beyond 10 years.

The analysis of the cumulative abnormal returns (CARs) computed for the various subsamples leads to the following results. Breaking down the sample according to the privatisation year, it emerges that the privatisations occurred in the years 1989-1990 show to have higher positive CARs. Moreover, privatised firms within the water, electricity, and transports industries outperform respect to the other industry sectors.

Small firms (in terms of total assets) tend to be characterised by cumulative abnormal returns significantly positive, while larger firms show cumulative returns generally not significantly different from zero. Moreover, privatisations with low net proceeds, high percentage of equity offered, high level of initial underpricing, and public offers all show positive cumulative returns both in the short- and in the long-run, in contrast with their respective counterparts.

Finally, figures 1-25 show the plots of cumulative returns for additional subsamples. CARs results to be lower for firms with higher productivity (ROE and ROCE, Figures 17-18), with higher growth rate (P\_E, Figure 19), with lower liquidity (QUICK, Figure 23), and with a higher number of directors (Figure 24). On the contrary, the impact the indebtedness ratios (GEARING or LEVERAGE, Figures 20-21) on the UK privatised firms performance does not appear to be relevant.

**Table 4 Privatised Firms: Dates, Industry Sector, Proceeds, Prices and % of equity sold**

Company Name	Industry Sector	First Trading Day	Proceeds at 1995 Prices	Offer/Tender Price	Offer_Rate	Method of Sale
Aea technology	BUSINESS SUPPORT	26-Sep-96	224.0	280	NA	NA
Amersham International plc	CHEMICALS	25-Feb-82	124.0	142	100	O
Anglian Water	WATER	12-Dec-89	NA	240	98.4	NA
Associated British Ports plc (I)	TRANSPORT	16-Feb-83	83.3	112	51.5	O
Associated British Ports plc (II)	TRANSPORT	19-Apr-84	83.9	270	48.5	O
British Aerospace plc (I)	MANUFACTURING	20-Feb-81	91.2	150	51.6	O
British Aerospace plc (II)	MANUFACTURING	14-May-85	542.2	375	59	O
British Airports Authority (BAA) plc	TRANSPORT	28-Jul-87	1697.2	245	95.6	O
(I) British Airports Authority (BAA) plc	TRANSPORT	28-Jul-87	1697.2	290	95.6	T
(II) British Airways plc	TRANSPORT	11-Feb-87	1262.2	125	97.5	O
British Energy	ENERGY	15-Jul-96	653.3	198	87.8	O
British Gas plc - sales of shares	ENERGY	8-Dec-86	7568.0	135	96.6	O
British Petroleum plc (I)	ENERGY	10-Jun-77	NA	845	49	O
British Petroleum plc (II)	ENERGY	12-Nov-79	691.7	363	5.2	O
British Petroleum plc (III)	ENERGY	26-Sep-83	940.3	435	7.2	T
British Petroleum plc (IV)	ENERGY	30-Oct-87	6998.7	330	36.8	O
British Steel plc	STEEL	5-Dec-88	3151.5	125	100	O
British Telecom plc (I)	TELECOMMUNICATIONS	3-Dec-84	5819.2	130	50.2	O
	NS					
British Telecom plc (II)	TELECOMMUNICATIONS	10-Dec-91	5597.0	335	25.9	O
	NS					
British Telecom plc (III)	TELECOMMUNICATIONS	19-Jul-93	5457.2	410	20.7	O
	NS					
Britoil plc (I)	ENERGY	23-Nov-82	1112.4	215	51	T
Britoil plc (II)	ENERGY	12-Aug-85	665.6	185	59	O
BTG	BUSINESS SUPPORT	6-Jul-95	NA	195	NA	NA
Cable and Wireless plc (I)	TELECOMMUNICATIONS	6-Nov-81	350.8	168	49.4	O
	NS					
Cable and Wireless plc (II)	TELECOMMUNICATIONS	5-Dec-83	455.4	275	22.3	T
	NS					
Cable and Wireless plc (III)	TELECOMMUNICATIONS	13-Dec-85	901.6	587	31.1	O
	NS					
east midland electricity	ELECTRICITY	11-Dec-90	523	240	97.5	O
eastern electricity	ELECTRICITY	11-Dec-90	648	240	97.6	O
Enterprise Oil plc	ENERGY	2-Jul-84	631.8	185	100	T
jaguar	AUTOMOBILES	10-Aug-84	294	165	100	O
london electricity	ELECTRICITY	11-Dec-90	523	240	97.5	O
manweb	ELECTRICITY	11-Dec-90	285	240	97.5	O
midlands electricity	ELECTRICITY	11-Dec-90	503	240	97.7	O
national power (I)	ELECTRICITY	12-Mar-91	2,231	175	60.9	O
national power (II)	ELECTRICITY	6-Mar-95	NA	476	38.3	O
norther electric	ELECTRICITY	11-Dec-90	295	240	97.5	O
Northern Ireland Electricity	ENERGY	18-Jun-93	725.8	100	96.5	O
northumbrian water	WATER	12-Dec-89	157	240	98.4	O
norweb	ELECTRICITY	11-Dec-90	415	240	98.4	O
power gen (I)	ELECTRICITY	12-Mar-91	1,367	175	59.5	O
power gen. (II)	ELECTRICITY	6-Mar-95	NA	512	36.6	O
Railtrack	TRANSPORT	20-May-96	2235.7	380	98	O
Rolls-Royce plc	MANUFACTURING	20-May-87	1485.2	170	96.7	O
scottish power	ELECTRICITY	18-Jun-91	1,956	240	96.4	O
seeboard	ELECTRICITY	11-Dec-90	306	240	97.5	NA
severn trent	WATER	12-Dec-89	849	240	98.4	O
south wales el.	ELECTRICITY	11-Dec-90	244	240	97.5	O
south western el	ELECTRICITY	11-Dec-90	295	240	97	O
southern elec	ELECTRICITY	11-Dec-90	648	240	97.5	O
southern water	WATER	12-Dec-89	392	240	98.4	O
TSB	BANKS	10-Oct-86	1,360	100	NA	NA
thames water	WATER	12-Dec-89	922	240	97.4	O
welsh water	WATER	12-Dec-89	346	240	98.4	O
wessex water	WATER	12-Dec-89	246	240	98.4	O
yorkshire el.	ELECTRICITY	11-Dec-90	497	240	97.5	O

**Table 5. -Underpricing and Short-Term Performance of UK Privatised Firms**

Company	1_day Price	Offer price	Underprici ng	Mkt_Tre nd	1_day AR	1_Month Company RET	1_Month FTSE Ret	1st_Mont h AR
Aea tecnology	323.5	280	0.15536	-0.00048	0.15584	0.13929	0.00251	0.13678
Amersham International plc	188	142	0.32394	-0.00200	0.32594	0.32394	-0.01142	0.33536
Anglian Water	288.5	240	0.20208	0.00423	0.19785	0.27500	0.02787	0.24713
Associated British Ports plc (I)	138	112	0.23214	-0.00731	0.23946	0.25000	-0.03284	0.28284
Associated British Ports plc (II)	266	270	-0.01481	-0.00536	-0.00946	-0.03333	0.01590	-0.04923
British Aerospace plc (I)	170	150	0.13333	-0.00385	0.13718	0.19333	0.02615	0.16719
British Aerospace plc (II)	416	375	0.10933	-0.00375	0.11308	0.05333	-0.00888	0.06221
British Airports Authority (BAA) plc	291	245	0.18776	0.01050	0.17725	0.18776	0.01322	0.17453
(I) British Airports Authority (BAA) plc	291	290	0.00345	0.01050	-0.00705	0.00345	0.01322	-0.00978
(II) British Airways plc	169	125	0.35200	0.00967	0.34233	0.36400	0.05441	0.30959
British Energy	192	198	-0.03030	-0.00737	-0.02293	-0.00126	-0.01129	0.01003
British Gas plc	147.75	135	0.09444	0.00687	0.08758	0.11481	0.03591	0.07891
British Petroleum plc (I)	912	845	0.07929	0.00145	0.07784	0.10533	0.02483	0.08050
British Petroleum plc (II)	356	363	-0.01928	-0.01468	-0.00460	0.06887	0.02577	0.04310
British Petroleum plc (III)	436	435	0.00230	-0.00013	0.00243	0.00230	-0.01191	0.01421
British Petroleum plc (IV)	265	330	-0.19697	0.03654	-0.23351	-0.19697	-0.02926	-0.16771
British Steel plc	127.25	125	0.01800	-0.00277	0.02077	0.00800	0.01004	-0.00204
British Telecom plc (I)	172	130	0.32308	0.02085	0.30223	0.42692	0.05833	0.36859
British Telecom plc (II)	327	335	-0.02388	-0.00531	-0.01857	-0.01940	0.02688	-0.04628
British Telecom plc (III)	413.5	410	0.00854	0.00214	0.00640	0.01098	0.03062	-0.01964
Britoil plc (I)	196	215	-0.08837	-0.00663	-0.08175	-0.12093	-0.02448	-0.09645
Britoil plc (II)	203	185	0.09730	0.00147	0.09583	0.21622	0.04232	0.17390
BTG	251	195	0.28718	0.00024	0.28694	0.42051	0.02739	0.39312
Cable and Wireless plc (I)	197	168	0.17262	-0.01288	0.18550	0.17857	0.03784	0.14073
Cable and Wireless plc (II)	271	275	-0.01455	-0.00102	-0.01352	0.01818	0.02287	-0.00469
Cable and Wireless plc (III)	585	587	-0.00341	0.00166	-0.00507	0.01363	0.02137	-0.00774
east midland electricity	290.5	240	0.21042	-0.00720	0.21762	0.19167	-0.01690	0.20856
eastern electricity	288	240	0.20000	-0.00720	0.20720	0.15833	-0.01690	0.17523
Enterprise Oil plc	185	185	0.00000	0.00562	-0.00562	-0.02162	-0.02647	0.00485
jaguar	179	165	0.08485	0.01960	0.06525	0.09091	0.03469	0.05622
london electricity	282	240	0.17500	-0.00720	0.18220	0.16250	-0.01690	0.17940
manweb	306	240	0.27500	-0.00720	0.28220	0.27083	-0.01690	0.28773
midlands electricity	284	240	0.18333	-0.00720	0.19053	0.15833	-0.01690	0.17523
national power (I)	212.5	175	0.21429	-0.00105	0.21534	0.18000	-0.00305	0.18305
national power (II)	456.5	476	-0.04097	-0.00532	-0.03565	-0.10084	0.03955	-0.14039
norther electric	282.5	240	0.17708	-0.00720	0.18428	0.19583	-0.01690	0.21273
Northern Ireland Electricity	126.5	100	0.26500	0.00101	0.26399	0.35500	0.00797	0.34703
northumbrian water	297	240	0.23750	0.00423	0.23327	0.30833	0.02787	0.28047
norweb	292	240	0.21667	-0.00720	0.22387	0.20000	-0.01690	0.21690
power gen (I)	212	175	0.21143	-0.00105	0.21248	0.16571	-0.00305	0.16876
power gen. (II)	491	512	-0.04102	-0.00532	-0.03570	-0.09570	0.03029	-0.12600
Railtrack	409.5	380	0.07763	-0.00174	0.07937	0.07368	-0.00841	0.08209
Rolls-Royce plc	232	170	0.36471	-0.01546	0.38016	0.28824	-0.00527	0.29350
scottish power	255.5	240	0.06458	-0.00276	0.06734	0.02708	-0.04175	0.06883
seeboard	282	240	0.17500	-0.00720	0.18220	0.17917	-0.01690	0.19606
severn trent	271	240	0.12917	0.00423	0.12493	0.18125	0.02787	0.15338
south wales el.	304	240	0.26667	-0.00720	0.27387	0.28333	-0.01690	0.30023
south western el	290	240	0.20833	-0.00720	0.21553	0.20000	-0.01690	0.21690
southern elec	290	240	0.20833	-0.00720	0.21553	0.17083	-0.01690	0.18773
southern water	281	240	0.17083	0.00423	0.16660	0.21667	0.02787	0.18880
TSB	85.5	100	-0.14500	-0.00332	-0.14168	-0.17500	0.01916	-0.19416
thames water	276	240	0.15000	0.00423	0.14577	0.24167	0.02787	0.21380
welsh water	281	240	0.17083	0.00423	0.16660	-0.05417	0.02787	-0.08203
wessex water	294	240	0.22500	0.00423	0.22077	0.29167	0.02787	0.26380
yorkshire el.	299.5	240	0.24792	-0.00720	0.25512	0.24375	-0.01690	0.26065

Note: First Day Abnormal Returns and First Month Abnormal Returns are computed as in Equation (1) and (2), respectively.

**Table 6 - Privatised Firms Cumulative Abnormal Returns (CARs) (%) for the whole sample and for various classifications. CARs include first-month returns. The sample period is 1977-1996.**

	<i>Average 1st-day AR</i>	<i>CAR_3M</i>	<i>CAR_6M</i>	<i>CAR_1Y</i>	<i>CAR_2Y</i>	<i>CAR_3Y</i>	<i>CAR_5Y</i>	<i>CAR_10 Y</i>
<i>Panel A: Whole Sample</i>								
<i>N=55</i>	0.129*** <i>7.385</i>	0.145*** <i>5.418</i>	0.202*** <i>4.323</i>	0.210*** <i>3.576</i>	0.305*** <i>4.336</i>	0.419*** <i>5.344</i>	0.573*** <i>4.918</i>	0.385*** <i>3.114</i>
<i>Panel B: Year of Privatisation</i>								
<b>1982</b>	0.161 <sup>*</sup>	0.344 <sup>*</sup>	0.367 <sup>**</sup>	0.349	0.380	0.360	0.731	0.841
<i>N=2</i>	<i>6.678</i>	<i>9.182</i>	<i>14.411</i>	<i>5.206</i>	<i>1.709</i>	<i>1.186</i>	<i>2.804</i>	<i>2.046</i>
<b>1983</b>	0.122	0.046	0.181	0.153	-0.075	-0.023	-0.052	0.394
<i>N=2</i>	<i>0.599</i>	<i>0.140</i>	<i>0.537</i>	<i>0.597</i>	<i>-0.621</i>	<i>-0.058</i>	<i>-0.122</i>	<i>2.226</i>
<b>1984</b>	0.088	0.113	0.108	0.071	0.076	0.332	0.543 <sup>*</sup>	0.702 <sup>*</sup>
<i>N=4</i>	<i>1.200</i>	<i>0.934</i>	<i>0.469</i>	<i>0.368</i>	<i>0.210</i>	<i>1.591</i>	<i>2.613</i>	<i>2.524</i>
<b>1985</b>	0.068	0.004	0.014	-0.182	0.075	0.436	0.490	0.423
<i>N=3</i>	<i>1.844</i>	<i>0.060</i>	<i>0.216</i>	<i>-0.711</i>	<i>1.030</i>	<i>0.858</i>	<i>1.300</i>	<i>2.098</i>
<b>1986</b>	-0.027	-0.157	-0.121	-0.227	-0.216	-0.267	-0.262	-0.778
<i>N=2</i>	<i>-0.236</i>	<i>-1.134</i>	<i>-0.518</i>	<i>-0.589</i>	<i>-1.034</i>	<i>-0.699</i>	<i>-0.523</i>	<i>-1.700</i>
<b>1987</b>	0.132	0.119	0.106	0.080	0.191	0.344 <sup>**</sup>	0.385	0.630 <sup>**</sup>
<i>N=5</i>	<i>1.154</i>	<i>1.017</i>	<i>1.119</i>	<i>0.582</i>	<i>1.441</i>	<i>3.755</i>	<i>1.263</i>	<i>2.993</i>
<b>1989</b>	0.179***	0.285***	0.205***	0.406***	0.346***	0.570***	0.562***	0.345
<i>N=7</i>	<i>12.005</i>	<i>7.477</i>	<i>5.102</i>	<i>13.199</i>	<i>7.512</i>	<i>6.078</i>	<i>4.566</i>	<i>1.578</i>
<b>1990</b>	0.219***	0.229***	0.306***	0.231***	0.438***	0.615***	1.076***	-
<i>N=12</i>	<i>21.899</i>	<i>15.287</i>	<i>17.116</i>	<i>10.488</i>	<i>20.196</i>	<i>41.821</i>	<i>30.746</i>	-
<b>1991</b>	0.119	0.097	0.128	0.149	0.299 <sup>*</sup>	0.442	0.477	-
<i>N=4</i>	<i>2.074</i>	<i>1.187</i>	<i>1.544</i>	<i>1.939</i>	<i>2.512</i>	<i>1.731</i>	<i>1.660</i>	-
<b>1993</b>	0.135	0.263	0.319	0.426	0.321	0.119	0.120	-
<i>N=2</i>	<i>1.050</i>	<i>0.937</i>	<i>0.886</i>	<i>0.742</i>	<i>0.637</i>	<i>0.213</i>	<i>0.814</i>	-
<b>1995</b>	0.072	0.065	0.696	0.729	0.928	1.000	0.996	-
<i>N=3</i>	<i>0.668</i>	<i>0.373</i>	<i>0.977</i>	<i>0.817</i>	<i>0.837</i>	<i>0.899</i>	<i>0.561</i>	-
<b>1996</b>	0.071	0.140	0.267	0.314	0.804 <sup>**</sup>	0.639 <sup>**</sup>	-	-
<i>N=3</i>	<i>1.366</i>	<i>1.373</i>	<i>2.655</i>	<i>2.493</i>	<i>8.074</i>	<i>4.417</i>	-	-
<i>Panel C: Industry</i>								
<b>Water</b>	0.179***	0.285***	0.205***	0.406***	0.346***	0.570***	0.562***	0.345
<i>N=7</i>	<i>12.005</i>	<i>7.477</i>	<i>5.102</i>	<i>13.199</i>	<i>7.512</i>	<i>6.078</i>	<i>4.566</i>	<i>1.578</i>
<b>Electricity</b>	0.180***	0.175***	0.247***	0.175***	0.355***	0.534***	0.752***	-
<i>N=17</i>	<i>7.928</i>	<i>5.508</i>	<i>7.824</i>	<i>4.583</i>	<i>6.503</i>	<i>7.677</i>	<i>4.747</i>	-
<b>Energy</b>	0.018	-0.011	0.006	-0.029	-0.020	0.194	0.105	0.111
<i>N=10</i>	<i>0.437</i>	<i>-0.154</i>	<i>0.071</i>	<i>-0.213</i>	<i>-0.126</i>	<i>1.043</i>	<i>0.498</i>	<i>0.707</i>
<b>Telecommunications</b>	0.076	0.120	0.125	0.177	0.174	0.117	0.345	0.712 <sup>*</sup>
<i>N=6</i>	<i>1.379</i>	<i>1.462</i>	<i>1.175</i>	<i>1.628</i>	<i>1.359</i>	<i>0.730</i>	<i>1.902</i>	<i>2.898</i>
<b>Transport</b>	0.137 <sup>*</sup>	0.156	0.139	0.304 <sup>*</sup>	0.423***	0.655***	1.005***	1.241 <sup>*</sup>
<i>N=6</i>	<i>2.375</i>	<i>1.708</i>	<i>1.244</i>	<i>2.324</i>	<i>5.695</i>	<i>6.615</i>	<i>5.621</i>	<i>6.519</i>
<i>Panel D: Size</i>								
<b>Small CAP</b>	0.177***	0.227***	0.328***	0.346***	0.488***	0.651***	1.067***	0.879***
<i>N=27</i>	<i>9.781</i>	<i>9.063</i>	<i>4.200</i>	<i>3.773</i>	<i>4.091</i>	<i>6.044</i>	<i>7.071</i>	<i>6.936</i>
<b>Large CAP</b>	0.081***	0.0598	0.076 <sup>**</sup>	0.063	0.121 <sup>*</sup>	0.215 <sup>**</sup>	0.094	0.161
<i>N=25</i>	<i>2.917</i>	<i>1.491</i>	<i>2.102</i>	<i>1.078</i>	<i>2.017</i>	<i>2.106</i>	<i>0.827</i>	<i>1.331</i>
<b>PANEL E: PROCEEDS</b>								
<b>Low</b>	0.177***	0.215***	0.253***	0.264***	0.375***	0.511***	0.849***	0.683***
<i>N=26</i>	<i>10.399</i>	<i>8.143</i>	<i>6.493</i>	<i>6.729</i>	<i>5.755</i>	<i>9.297</i>	<i>10.545</i>	<i>3.595</i>
<b>High</b>	0.084 <sup>**</sup>	0.079 <sup>*</sup>	0.091 <sup>*</sup>	0.090	0.164 <sup>**</sup>	0.245 <sup>**</sup>	0.212 <sup>**</sup>	0.171
<i>N=24</i>	<i>2.715</i>	<i>1.725</i>	<i>1.887</i>	<i>1.198</i>	<i>2.341</i>	<i>2.202</i>	<i>1.738</i>	<i>1.032</i>
<i>Panel F: % Equity sold</i>								
<b>&lt; 96.65 (median value)</b>	0.056 <sup>**</sup>	0.042	0.067	0.068	0.144 <sup>**</sup>	0.266 <sup>**</sup>	0.297 <sup>*</sup>	0.585***
<i>N=23</i>	<i>2.161</i>	<i>1.033</i>	<i>1.431</i>	<i>1.072</i>	<i>2.260</i>	<i>2.496</i>	<i>1.951</i>	<i>3.713</i>
<b>&gt; 96.65 (median value)</b>	0.190***	0.227***	0.253***	0.265***	0.337***	0.482***	0.685***	0.271
<i>N=29</i>	<i>11.124</i>	<i>8.607</i>	<i>7.969</i>	<i>5.844</i>	<i>5.551</i>	<i>8.104</i>	<i>8.180</i>	<i>1.674</i>
<i>Panel G: 1st-day AR</i>								
<b>Low</b>	-	0.016	0.027	0.023	0.100	0.151	0.116	0.207
<i>N=29</i>	-	<i>0.515</i>	<i>0.707</i>	<i>0.420</i>	<i>1.332</i>	<i>1.667</i>	<i>1.004</i>	<i>1.410</i>
<b>High</b>	-	0.288***	0.397***	0.419***	0.535***	0.718***	1.011***	0.756***
<i>N=26</i>	-	<i>13.712</i>	<i>5.467</i>	<i>4.485</i>	<i>4.948</i>	<i>6.829</i>	<i>6.385</i>	<i>4.107</i>
<i>Panel H: Method of sale</i>								
<b>Public Offer</b>	0.149***	0.168***	0.206***	0.199***	0.282***	0.408***	0.512***	0.398***
<i>N=44</i>	<i>8.025</i>	<i>6.191</i>	<i>6.943</i>	<i>4.573</i>	<i>6.419</i>	<i>6.424</i>	<i>5.481</i>	<i>2.931</i>
<b>Tender</b>	-0.019	-0.068	-0.120	-0.035	-0.023	0.142	0.420	0.632 <sup>**</sup>
<i>N=6</i>	<i>-1.509</i>	<i>-1.251</i>	<i>-1.836</i>	<i>-0.398</i>	<i>-0.111</i>	<i>0.754</i>	<i>1.713</i>	<i>2.575</i>

Note: \*\*\*, \*\*, \* indicate significance at the 1, 5 and 10% level, respectively.  
T-statistics are reported in italic below the coefficient estimate.

**Table 7 - Variables Descriptive Statistics and Correlation Matrix with the initial underpricing**

	Mean	Sd. Dev.	No. Obs.	Underpricing
UNDERPRICING	0.129	0.128	55	-
MKT. TREND	-0.001	0.009	55	-.161
PROCEEDS	1330.970	1807.404	50	-.309*
SALES (m)	3869.485	7614.174	52	-.455**
CAP. EMPLOYED (m)	5486.278	10338.792	49	-.318*
ASSETS (m)	4059.094	6603.399	52	-.487**
ROE	13.652	9.396	36	-.304
ROCE	17.957	9.949	52	-.305*
P_E	11.114	5.516	52	-.097
Q_RATIO	1.933	2.281	49	.055
LEVERAGE (%)	10.9	0.119	41	-.167
DEBT_EQUITY (%)	19.570	75.981	35	-.256
TOT_DEBT (m)	757.038	1429.089	52	-.438**
GEARING (%)	20.1	0.111	52	-.085
% FIXED ASSETS	0.586	0.188	52	-.035
% INTANGIBLE ASSETS	0.019	0.064	52	-.055
R&D	0.007	0.019	49	.111
QUICK (%)	1.060	0.417	52	.275*
No DIRECTORS	11	2.339	50	-.415**
% NON_EXECUTIVE DIRECTORS	0.427	0.139	46	-.088

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

(m) indicates data in millions

**Table 8 - Results of cross-sectional multiple regression analysis <sup>a</sup>**

Explanatory Variable	Coefficient	(t-statistic)
Constant	0.7478***	(3.315)
SIZE	-0.0512***	(-3.922)
P_S	0.3008***	(3.553)
DEBT_EQUITY	-0.0004***	(-4.172)
OFFER_RATE	-0.0029*	(-1.933)
ROCE	-0.0033***	(-3.213)
O_T	0.1927***	(11.971)
R <sup>2</sup>	0.786	
Adj. R <sup>2</sup>	0.733	
F-value	14.72***	

\*\*\*, \*: Significant at the 1% and 10% level, respectively.

<sup>a</sup> Underpricing =  $\beta_0 + \beta_1(\text{size}) + \beta_2(P\_S) + \beta_3(\text{debt\_equity}) + \beta_4(\text{offer\_rate}) + \beta_5(\text{ROCE}) + \beta_6(O\_T) + \epsilon$ ; where underpricing = market adjusted 1<sup>st</sup> day return; size = natural logarithm of the total assets of firm prior to offering; P\_S = dummy variable equal to 1 in the case of a primary offering, 0 otherwise; debt\_equity = total debt to total assets ratio in percentage; offer-rate = percent of equity offered to the public; ROCE = Return on capital employed; O\_T = Dummy variable taking on the value 1 if the method of sale is a public offer and 0 if it is a tender offer.

**Table 9 - Variables Description**

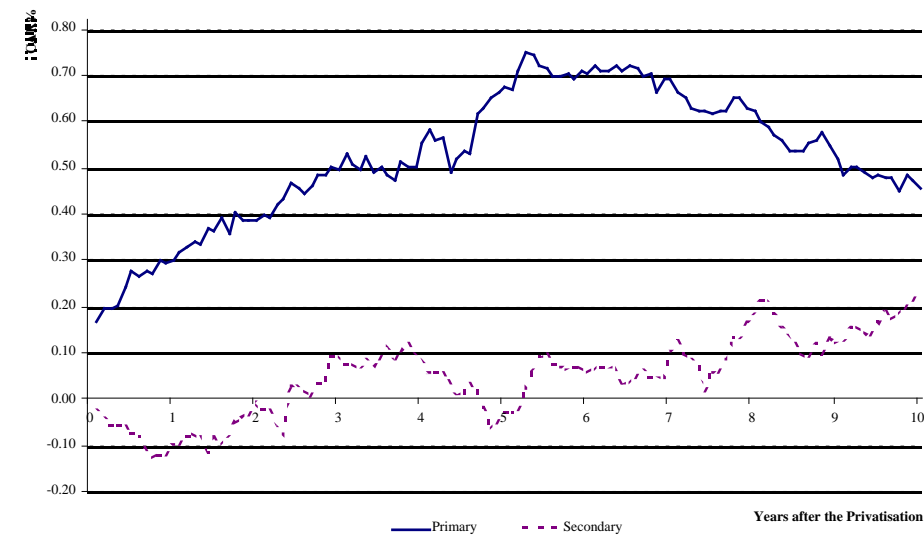
Variable	Formula	Description
Underpricing	$\frac{P_{1day}^i - P_o^i}{P_o^i}$	Where $P_{1day}^i$ is the unadjusted price on the first trading day and $P_o$ is the offer price for the firm $i$
1 <sup>st</sup> -day AR <sub><i>i</i></sub>	$\frac{P_{1day}^i - P_o^i}{P_o^i} - \frac{P_{1day}^{FTSE} - P_{oday}^{FTSE}}{P_{oday}^{FTSE}}$	Where $P_{oday}$ is the price at the offer date.
1 <sup>st</sup> -month AR <sub><i>i</i></sub>	$\frac{P_{1month}^i - P_o^i}{P_o^i} - \frac{P_{1month}^{FTSE} - P_{oday}^{FTSE}}{P_{oday}^{FTSE}}$	Where $P_{1month}$ is the price on the last trading day of the first trading month
AR <sub><i>i</i></sub> from second month	$\frac{P_{2month}^i - P_{1month}^i}{P_{1month}^i} - \frac{P_{2month}^{FTSE} - P_{1month}^{FTSE}}{P_{1month}^{FTSE}}$	Where $P_{2month}$ is the price on the last trading day of the second trading month. AR for the successive months are similarly computed.
CAR <sub><i>s</i></sub>	$\sum_{t=1}^s AR_t$	Where $s$ is the period for which we compute the summatory, specifically: 3 month, 6 months, and 1, 2, 3, 5 and 10 years.
O_T	0; 1	Dummy variable taking on the value 1 if the method of sale is a public offer and 0 if it is a tender offer.
P_S	0; 1	dummy variable equal to 1 in the case of a primary offering, 0 otherwise
Proceeds	millions	Net proceeds from the sale at the 1995 prices
Offer-Rate	Equity sold / total Equity	percent of equity offered to the public
Year	From 1977 to 1996	Year of the privatisation
Market Trend	$\frac{P_{1day}^{FTSE} - P_{oday}^{FTSE}}{P_{oday}^{FTSE}}$	This is the market return between the 1 <sup>st</sup> trading day and the last offer day.
Size	Log(Total Assets)	natural logarithm of the total assets of firm prior to offering
Sales	millions	total sales from principal activities of firm prior to offering
ROE	$\frac{\text{Earned for Ordinary}}{\text{Equity Capital \& Reserves} - \text{Tot Intangibles}} * 100$	Return on Equity
ROCE	$\frac{EBIT}{\text{TotCapEmpl} + \text{ShortTermDebt} - \text{Intan gibles}} * 100$	Return on capital employed
P_E	$\frac{\text{Published Earned for Ordinary}}{\text{Average no of shares in issue in the period}}$	Net earnings per share
Q_RATIO	$\frac{\text{MarketValue}}{\text{BookValue}} * 100$	This is the market value to book value ratio
Leverage	Total debt / Shareholder Equity	This is the total debt to the shareholder equity ratio
DEBT_EQUITY	Total Debt/ Total assets	This is the total debt to total assets ratio in percentage
TOT_DEBT	Long term debt + Short Term Debt	This is the total of all long and short term borrowings of firm prior to offering
Gearing	$\frac{\text{Pref. Capital} + \text{Total Debt}}{\text{Cap.Empl.} + \text{ShortT Borrowings} - \text{Intan gibles}} (\%)$	This is given by the sum of preference capital and total debt divided by total capital employed plus short term borrowings minus total intangibles
Fixed Assets	millions	The net total (after deducting accumulated depreciation) of land and buildings, plant and machinery, construction in progress and other fixed assets.
Intangible Assets	millions	This includes research and development, goodwill, patents, trade marks, deferred charges, formation expenses and concessions.
R&D	millions	This figure includes regular write-offs to the profit and loss account of research and development capitalised in the balance sheet.
QUICK	$\frac{\text{Tot Curr Assets} - \text{Tot Stock} - \text{Work inProgress}}{\text{Tot Curr Liabilities}} * 100$	This is given by total current assets minus total stock and work in progress divided by total current liabilities.
No Directors	Units	This includes executive and non-executive directors, but exclude alternate directors.
Non Executive Directors	$\frac{\text{Non Executive Directors}}{\text{Total Directos}} * 100$	This is the percentage of non executive directors over the total number of directors



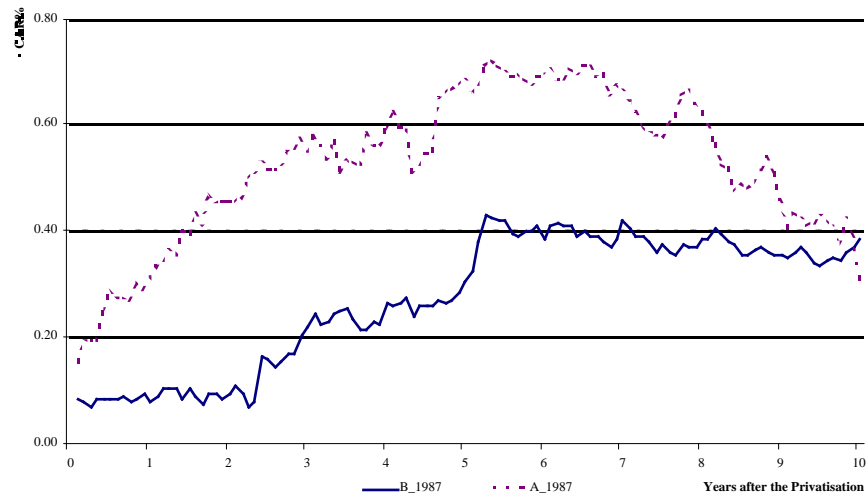
**Figure 1 - Cumulative Average Adjusted Returns for the whole sample of UK privatised firms, 1977-1996**



**Figure 3 - Performance by Primary or Secondary Issue**



**Figure 2 - Performance of firms privatised before and after 1987**



**Figure 4 - Water Industry performance**

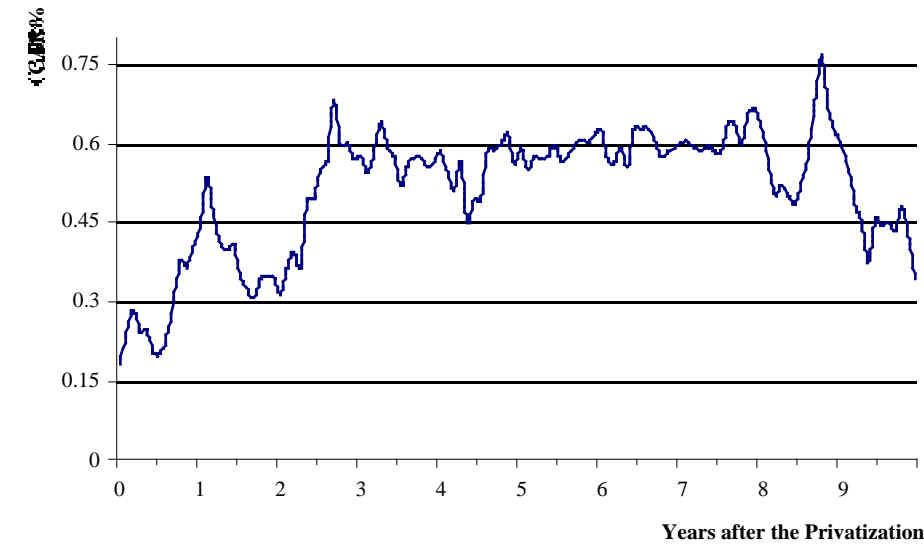


Figure 5 - Performance by Primary or Secondary Issue

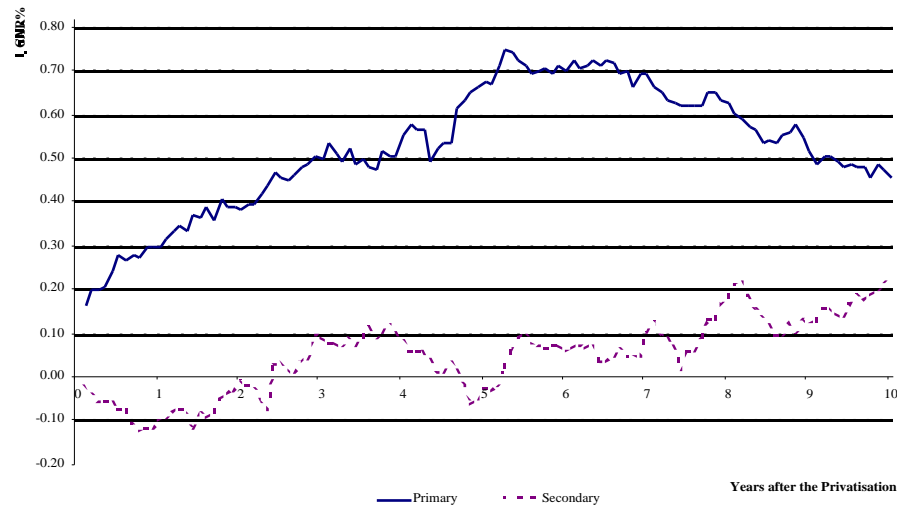


Figure 7 - Electricity Industry Performance

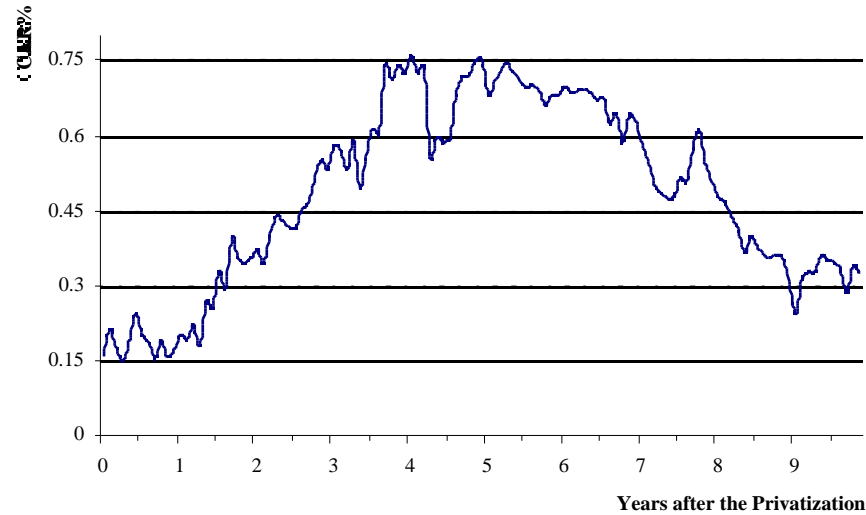


Figure 6 - Water Industry performance

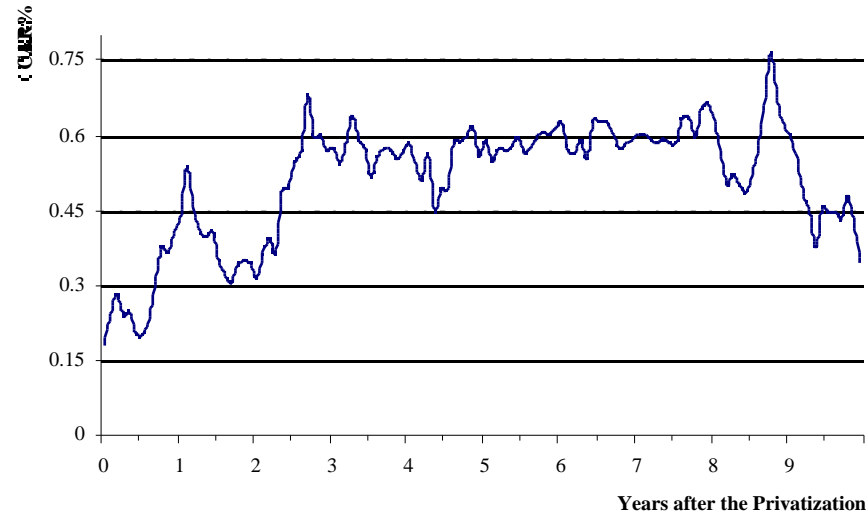


Figure 8 - Telecommunications Industry performance

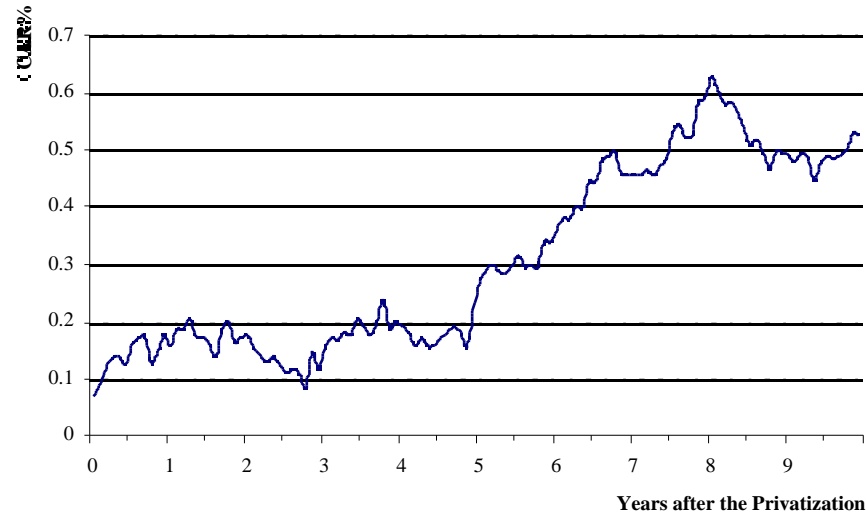


Figure 9 - Energy Industry Performance

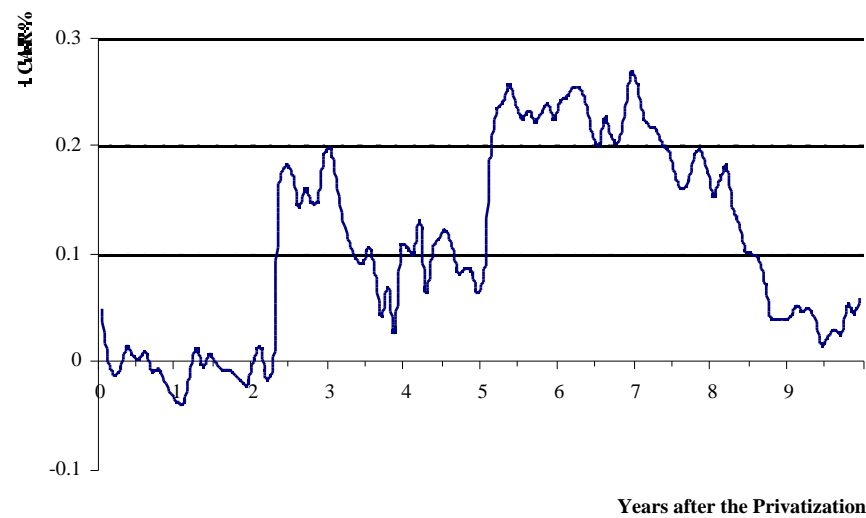


Figure 11 - Manufacturing Industry Performance

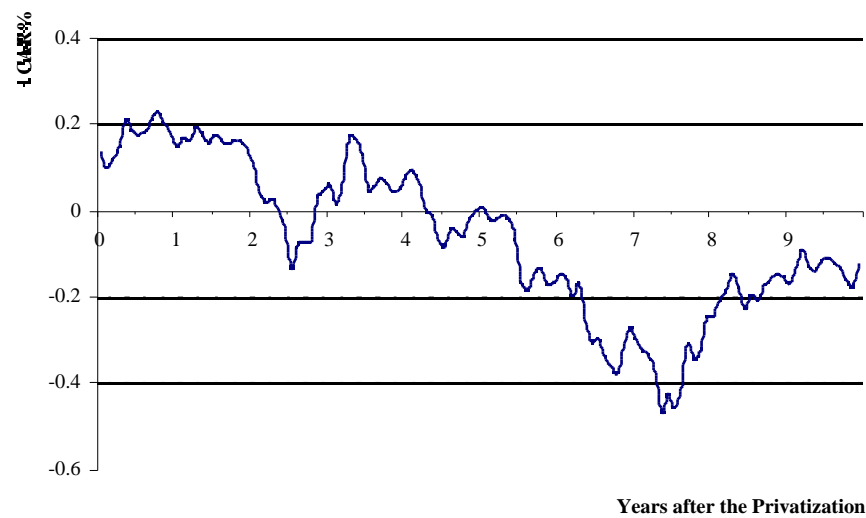


Figure 10 - Transport Industry Performance

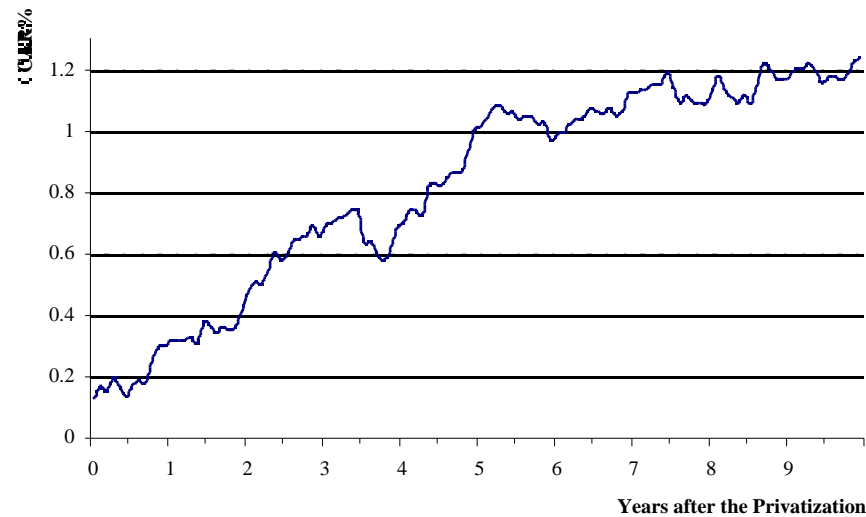


Fig. 12 - Proceeds below and above the Median Value (639.9£)

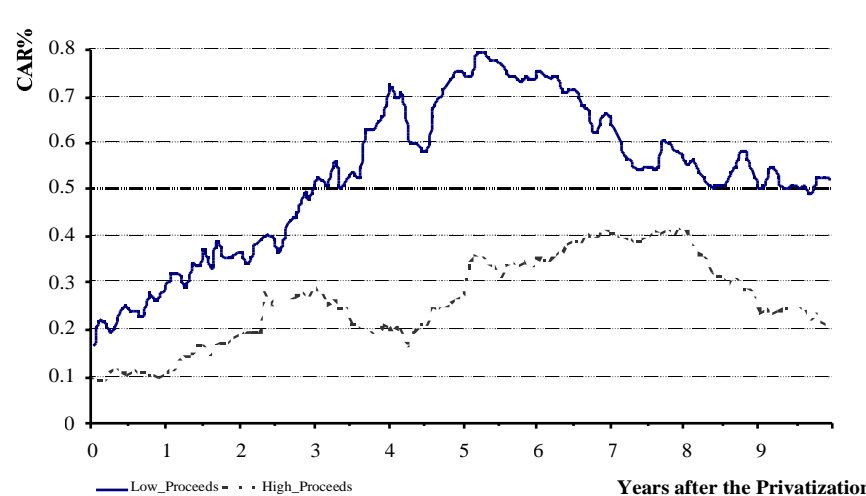


Figure 13 - Performance by Method of Sales

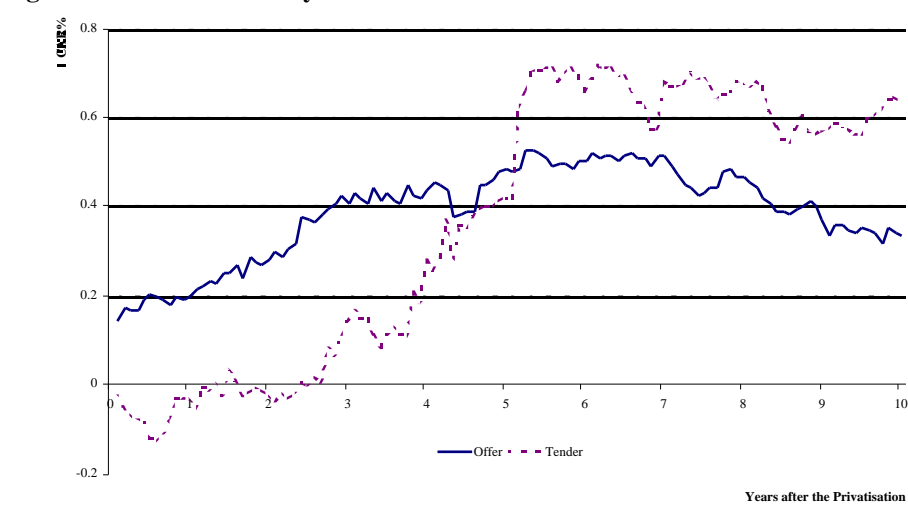


Figure 15 - Performance by percentage of Equity sold

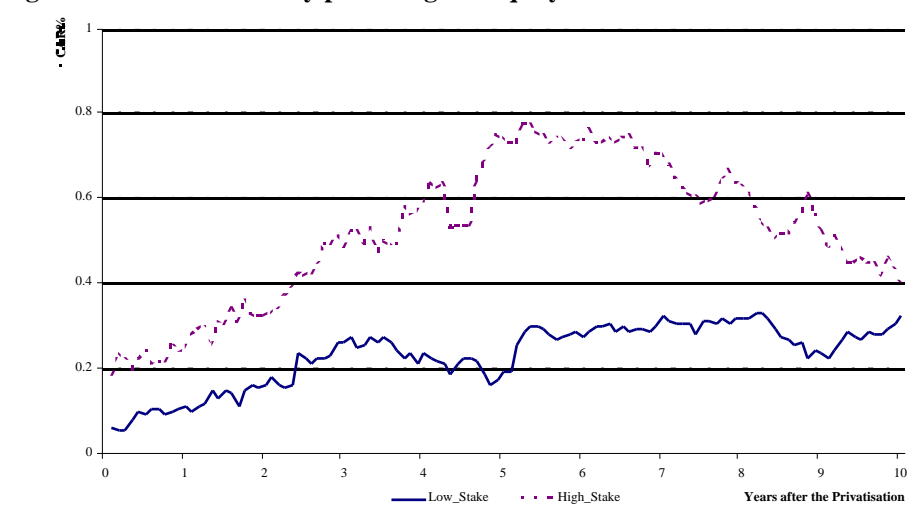


Figure 14 - Performance by the level of initial underpricing

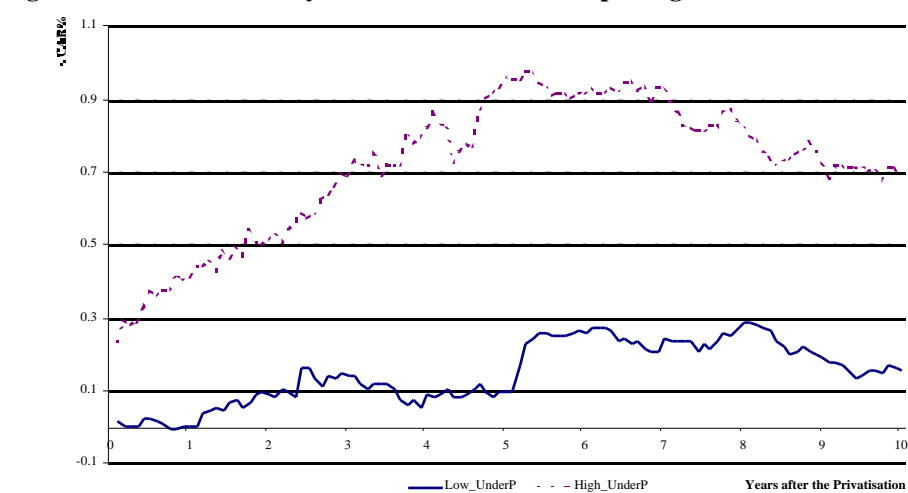


Figure 16 - Performance by Market Capitalisation

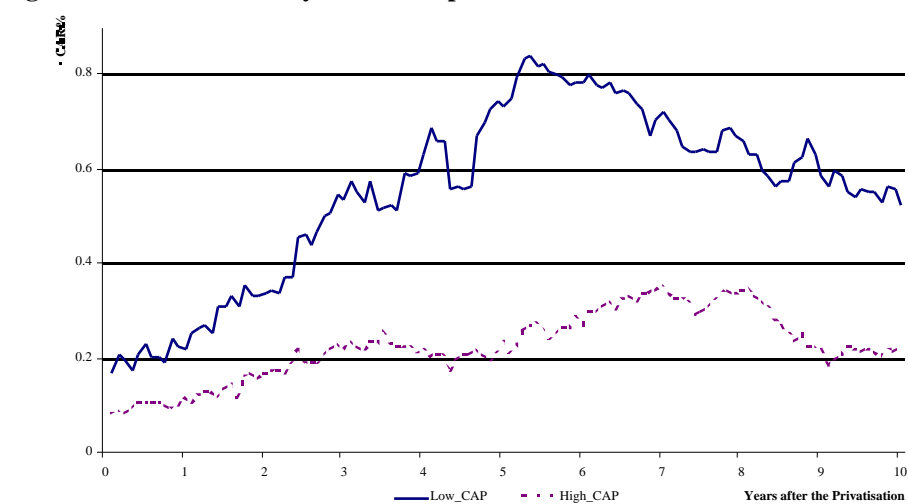


Figure 17 - Performance by ROE

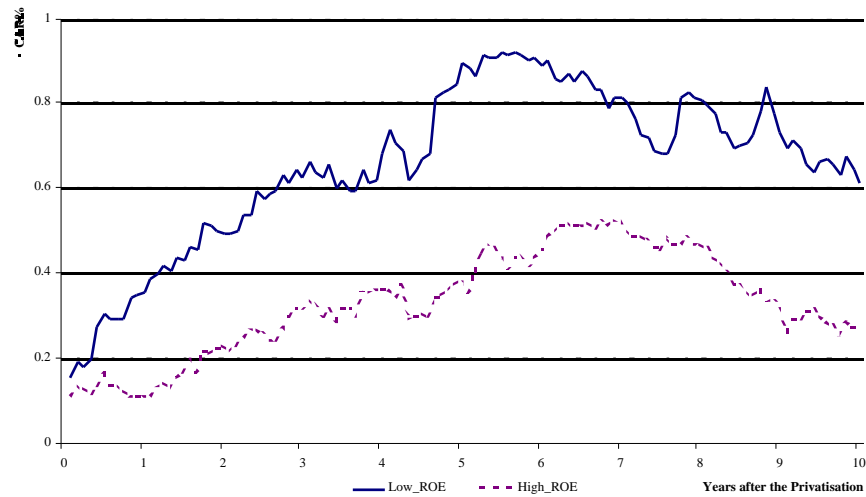


Figure 19 - Performance by P/E

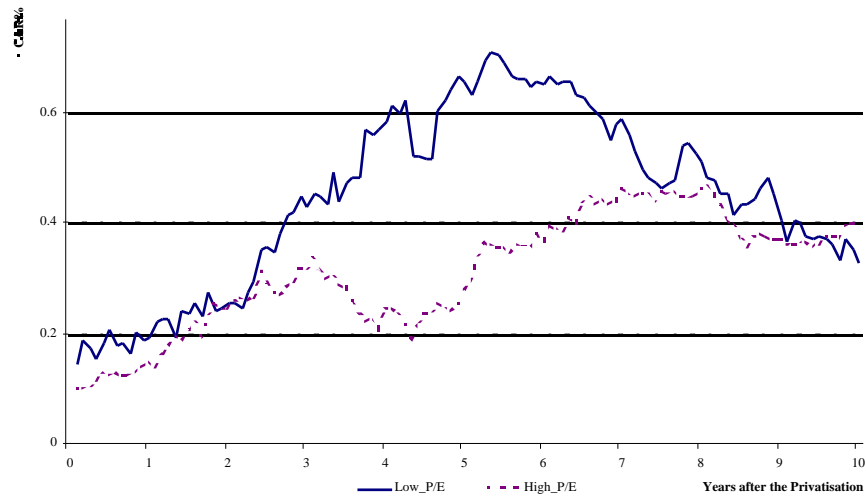


Figure 18 - Performance by ROCE

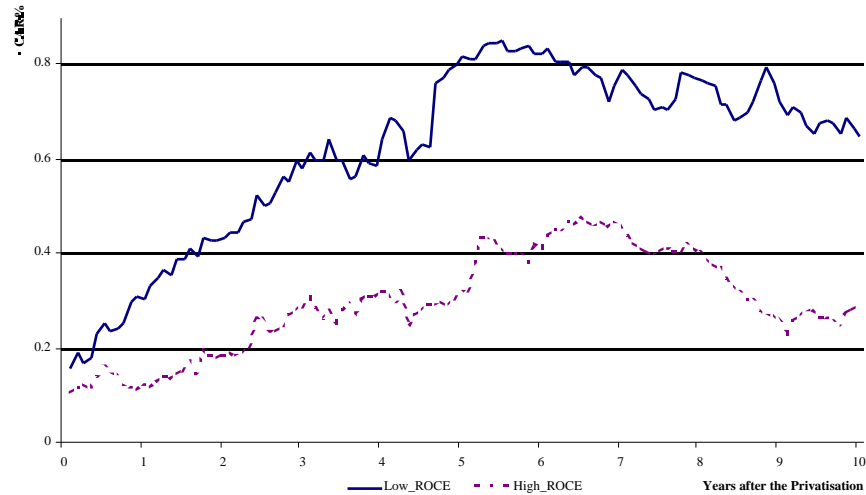


Figure 20 - Performance by Gearing

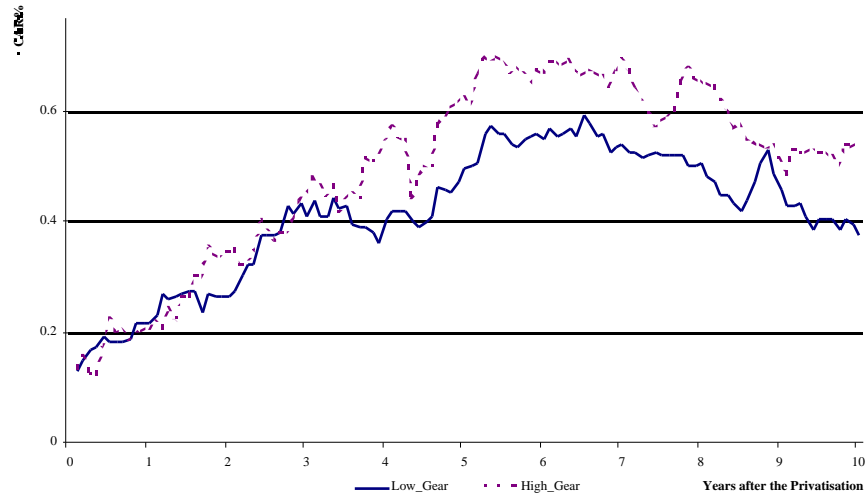


Figure 21 - Performance by Leverage

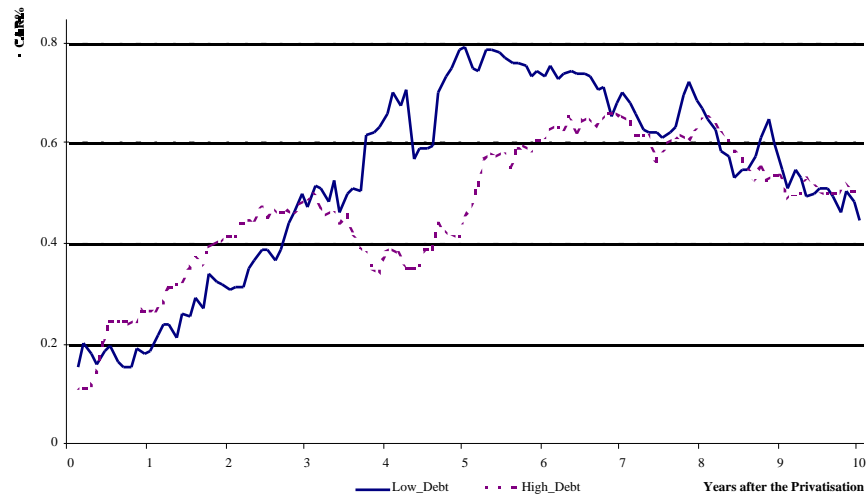


Figure 23 - Performance by Cash Availability

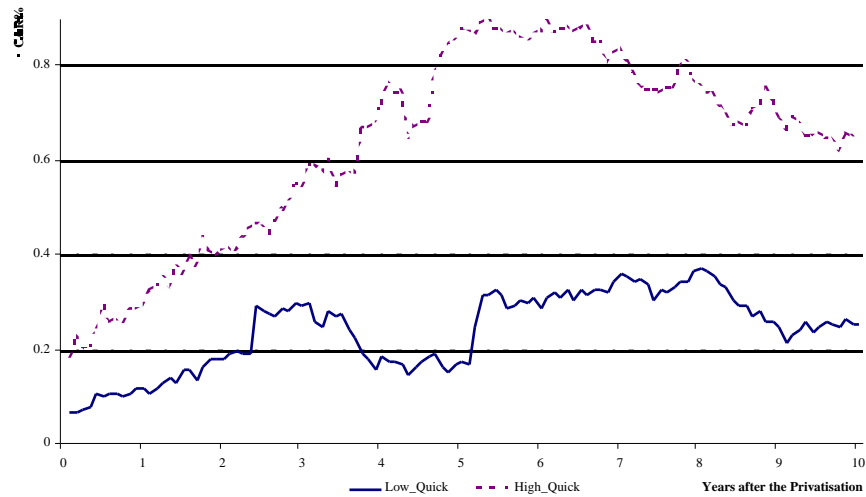


Figure 22 - Performance by Fixed Assets Proportion

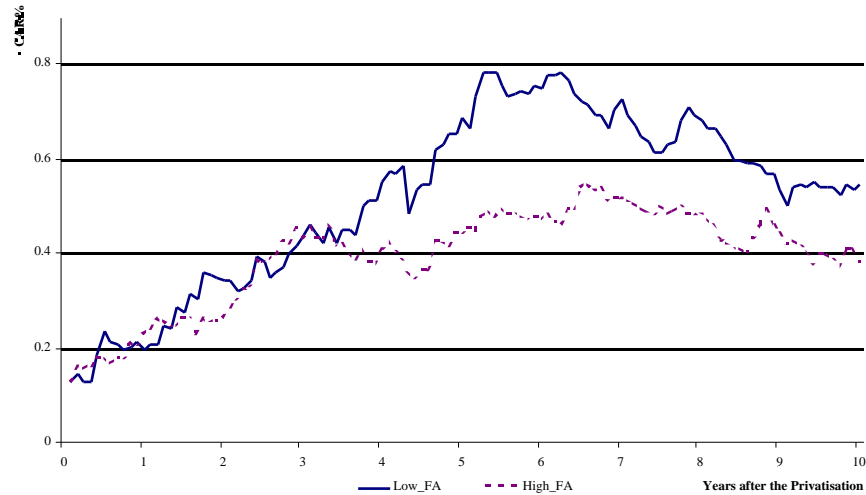


Figure 24 - Performance by Number of Directors

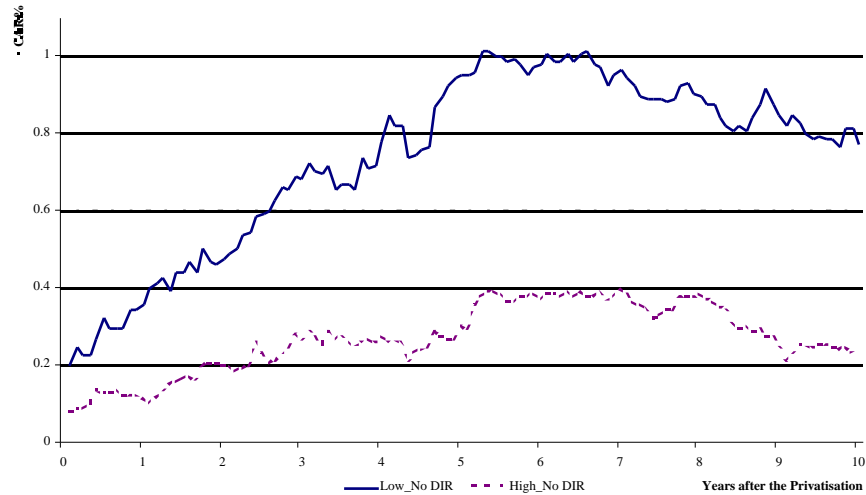
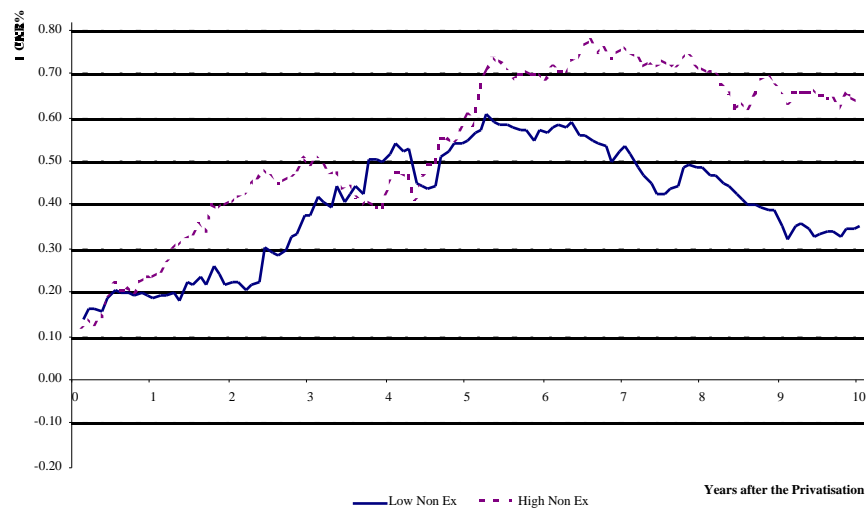


Figure 25 - Performance by % of Non Executive Directors



## 6. Discussion and concluding remarks

The available empirical evidence allows for some unambiguous conclusions and some conjectures.

Firstly it is clear that the actual terms of the British privatisations determined considerable underpricing. Our own findings on short term underpricing, based on a sample of 55 privatisation operations, are reported above<sup>13</sup>. We found evidence of unweighted average abnormal return on the first day of around 13% This is somewhat lower than other findings we reported above, because of the smoothing effect of the placements of subsequent tranches. However a company-by-company examination confirms that underpricings of more than 20-30% were not uncommon for the main privatised companies. We are unable to offer an individual explanation, but on average the evidence points to substantial short run capital gains for investors.

As Vickers and Yarrow (1988) observed, underpricing implies a change in the distribution of wealth. The winners were those who bought shares on issue, and the losers were the taxpayers. The taxpayer would have had lower taxes or more public services if underpricing had not happened. The authors give the following reasons for believing that this effect was undesirable:

- the arbitrariness of wealth redistribution as such was not linked to any socially useful function;
- the development of rent-seeking activities;
- the benefit to the foreign sector, which corresponds to a loss of national wealth;
- the additional effect connected to the loss of welfare for the taxpayer caused by the distortional nature of taxation;
- lastly the cost provoked by a possible re-nationalisation where this would lead to a loss in the capital account for the shareholders.

These observations are still valid ten years later, and one could say are amplified by the placements during the 90's. However, added to this, and in our opinion more important, are considerations related to the subsequent *outperformance* of the stocks, especially in the case of regulated utilities.

If to a certain degree underpricing is a typical phenomenon of all the IPOs, worth in the region of 12%-14% in many markets, and there is still a difference which is specifically attributable to

---

<sup>13</sup> Information on some minor privatized companies were not available to us.



privatisations, usually for the ordinary IPOs the excessive initial gain is corrected by subsequent underperformance.

We have seen that with different measures of long term abnormal returns we find that the purchaser of an equally weighted portfolio of shares of privatised firms would have greatly exceeded the return of the FTA stock exchange index, as well as other benchmark indices, and obtained in any case a return that was far higher than that of the other private IPOs. In some cases (the electricity sector) the real average annual return was actually double that of the FTA index.

We repeated the exercise of calculating the abnormal returns for a sample of privatised firms (55 cases), extending the analysis to different periods of time: 1 year, 5 years, 10 years (for the latter the sample was reduced to 14 cases). See Tab. 6.

While this measure can be biased for statistical reasons, there is evidence of abnormal returns for UK PIPOs in the long run (using the FTA index as a benchmark and using as share prices the monthly Datastream values corrected by dividends and other operations).

The cumulative abnormal returns are 21% at one year; 30% at two years; 57% at five years<sup>14</sup>.

The values are statistically significant and they appear to undeniably confirm that the returns of privatised firms, after the initial underpricing, were much higher than those of the rest of the companies quoted.

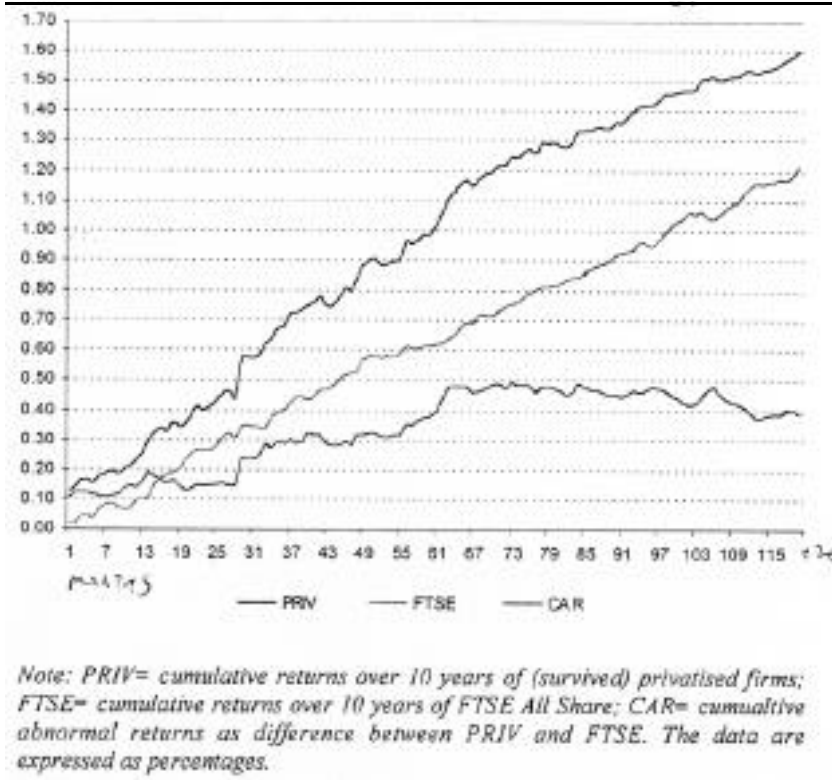
The empirical evidence thus seems to confirm the rather cynical comment from within the City mentioned at the beginning of the paper. Beyond the initial “dowry”, the market appreciated the protection of the monopolistic position granted by the government to the privatised firms. It is no coincidence that sectors such as electricity and water, showed particularly high abnormal returns<sup>15</sup>.

---

<sup>14</sup> For a smaller sample, we still have 38% abnormal return after 10 years.

<sup>15</sup> For example according to OFWAT (1991) in the water sector despite slow demand dynamics, and notwithstanding the great investments to tackle the qualitative adjustments required by Community norms amongst other things, the sustained price dynamics (+50% in ten years) should have guaranteed a 20% pre-tax profit, compared to a return on equity in the 70 years prior to World War I of less than 7% in real terms (while bonds provided 1% real profit). It seems difficult to say that, at least in this case, the regulator was surprised by the profits from the utilities. Anyway, except for momentary fluctuations, the financial market did not really take into serious consideration the capacity or desire of the regulators to create competitive conditions in the industries or at any rate to keep prices at the lowest levels compatible with the financial sustainability of the firms.

Figure 26 - Abnormal returns of privatized companies in the long term



This performance was particularly intense in sectors in which the market power of the firms has remained considerable, as with water and energy. This points to lax regulation as a possible explanation of why underpricing was not followed in the UK by underperformance. More recent evidence (after 1997, the New Labour government, the windfall tax, and often a more strict regulation) would probably show a reverse of these trends, and this may confirm that the change of policy and regulatory regime has the last word in the performance of privatised utilities. Further research is needed to establish the correlation between long run abnormal returns for PIPOs and regulatory environment.

## BIBLIOGRAPHICAL REFERENCES

- BOYFIELD K., «Privatization: a Prize Worth Pursuing», in European Policy Forum, May 1997
- CAWTHRON I., «Regulated Industries: Returns to Private Investors to May 1998», CRI, Occasional Paper 11, London, 1999.
- CHOI S., NAM S., «The short run performance of IPOs of privately and publicly owned firms: international evidence» in *Multinational Finance Journal*, 2000
- COFFEE J.C., «Privatisation and Corporate Governance, The Lessons from Securities Market Failure», *Columbia Law School Working Paper* No.158, Oct. 1999
- CONNOLLY S., MUNRO A., *Economics of the Public Sector*, Prentice Hall Europe, Pearson Education Ltd., London 1999
- CRAGG M., DYCK I.J.A., «Executive Pay and UK Privatisation: the Demise of ‘One Country, Two Systems’», *Journal of Business Research* 2000, No 47, 1999, pp.3-18
- CRAGG M., DYCK I.J.A., «Management control and privatization in the UK», *RAND Journal of Economics*, no.3 Vol 30 Autumn 1999, p.475-497
- CURWEN P. (ed), *Understanding the UK Economy*, London, Macmillan Press Ltd., 1997.
- CURWEN P., *Restructuring Telecommunications: a Study of Europe in a Global Context*, London, Macmillan Press Ltd, 1997
- CHANNELLS L., «The windfall tax» in *Fiscal Studies*, no.18, 1997.
- DEWENTER K., MALATESTA P.H., «Public offerings of state-owned and privately owned enterprises: an international comparison» in *Journal of Finance*, 52, 1997
- DOBEK, *The Political Logic of Privatization. Lessons from Great Britain and Poland*, Praeger, London, 1993
- GAVED M., GOODMAN M., *Deeper Share Ownership*, The Social Market Foundation, Paper n. 12, London, 1992
- HAYRI A., YILMAZ K., «Privatisation and Stock Market Efficiency: the British Experience», *Scottish Journal of Political Economy*, Vol. 44, Number 2, Edinburg, May 1997
- HELM D., *British Utility Regulation. Principles, Experience and Reform*, Oxford Press, Oxford, 1995
- HUANG Q., LEVICH R.M., «Underpricing of New Equity Offering by Privatised Firms: an International Test», *NY Paper*, 14 Sept. 1999

JONES S., MEGGINSON W., NASH R., NETTER J., «Share issue privatisations as financial means to political and economic ends» in *Journal of Financial Economics*, 53, 1999, pp.217-253

KLEINWORTH BENSON LTD, *The Regional Electricity Companies Share Offers*, London, November 21, 1990

LEVIS M., «The long run performance of initial public offerings: the UK experience 1980-88», *Financial Management*, Spring 1993

MARTIN S., PARKER D., *The Impact of Privatisation: Ownership and Corporate Performance in the UK*, Routledge, London, 1997

MEGGINSON W.L., NETTER J.M., *From State to Market: a Survey of Empirical Studies on Privatization* in *Journal of Economic Literature*, vol. XXXIX, 2, June 2001

MEGGINSON W.L., NASH R., NETTER J., SCHWARTZ A., «The long term return to investors in share issue privatizations», in *Financial Management* 29, 2000, pp.67-77

MENYAH K., PAUDYAL K., INYANGETE C., «Subscriber return, Underpricing, and Long term performance of UK privatisation initial public offers» in *Journal of Economic Business*, 47, 1995, pp. 473-95

MENYAH K., PAUDYAL K., «Share issue privatisations: the UK experience» in LEVIS M. (ed.), *Empirical issues in raising equity capital*, Amsterdam, Elsevier Science, 1996

OFWAT, OFFICE OF WATER SERVICES, *Cost of Capital. A Consultation Paper*, Vol. 2, July 1991

PRIVATISATION INTERNATIONAL, *Privatisation Yearbook*, 1994 - on

PEROTTI E., GUNEY S., «Successful privatisation plans: enhanced credibility through timing and pricing of sales» in *Financial Management*, 22, 1993, pp.84-98

PEROTTI E., VAN OIJEN P., «Privatisation, political risk and stock market development in emerging economies», in *Journal of International Money and Finance*, 2000

RITTER J.R., «The long run performance of initial public offerings» in *Journal of Finance* no.46, pp.3-27

VICKERS, YARROW G., *Privatization: An Economic Analysis*, MIT Press, Cambridge (Massachusetts), London, 1988.

# NOTE DI LAVORO DELLA FONDAZIONE ENI ENRICO MATTEI

## Fondazione Eni Enrico Mattei Working Papers Series

Our working papers are available on the Internet at the following addresses:

*Server WWW:* [WWW.FEEM.IT](http://WWW.FEEM.IT)

*Anonymous FTP:* [FTP.FEEM.IT](http://FTP.FEEM.IT)

[http://papers.ssrn.com/abstract\\_id=XXXXXX](http://papers.ssrn.com/abstract_id=XXXXXX)

SUST	1.2001	<i>Inge MAYERES and Stef PROOST:</i> <u>Should Diesel Cars in Europe be Discouraged?</u>
SUST	2.2001	<i>Paola DORIA and Davide PETTENELLA:</i> <u>The Decision Making Process in Defining and Protecting Critical Natural Capital</u>
CLIM	3.2001	<i>Alberto PENCH:</i> <u>Green Tax Reforms in a Computable General Equilibrium Model for Italy</u>
CLIM	4.2001	<i>Maurizio BUSSOLO and Dino PINELLI:</i> <u>Green Taxes: Environment, Employment and Growth</u>
CLIM	5.2001	<i>Marco STAMPINI:</i> <u>Tax Reforms and Environmental Policies for Italy</u>
ETA	6.2001	<i>Walid OUESLATI:</i> <u>Environmental Fiscal Policy in an Endogenous Growth Model with Human Capital</u>
CLIM	7.2001	<i>Umberto CIORBA, Alessandro LANZA and Francesco PAULI:</i> <u>Kyoto Commitment and Emission Trading: a European Union Perspective</u>
MGMT	8.2001	<i>Brian SLACK (xlv):</i> <u>Globalisation in Maritime Transportation: Competition, uncertainty and implications for port development strategy</u>
VOL	9.2001	<i>Giulia PESARO:</i> <u>Environmental Voluntary Agreements: A New Model of Co-operation Between Public and Economic Actors</u>
VOL	10.2001	<i>Cathrine HAGEM:</i> <u>Climate Policy, Asymmetric Information and Firm Survival</u>
ETA	11.2001	<i>Sergio CURRARINI and Marco MARINI:</i> <u>A Sequential Approach to the Characteristic Function and the Core in Games with Externalities</u>
ETA	12.2001	<i>Gaetano BLOISE, Sergio CURRARINI and Nicholas KIKIDIS:</i> <u>Inflation and Welfare in an OLG Economy with a Privately Provided Public Good</u>
KNOW	13.2001	<i>Paolo SURICO:</i> <u>Globalisation and Trade: A "New Economic Geography" Perspective</u>
ETA	14.2001	<i>Valentina BOSETTI and Vincenzina MESSINA:</i> <u>Quasi Option Value and Irreversible Choices</u>
CLIM	15.2001	<i>Guy ENGELN (xlii):</i> <u>Desertification and Land Degradation in Mediterranean Areas: from Science to Integrated Policy Making</u>
SUST	16.2001	<i>Julie Catherine SORS:</i> <u>Measuring Progress Towards Sustainable Development in Venice: A Comparative Assessment of Methods and Approaches</u>
SUST	17.2001	<i>Julie Catherine SORS:</i> <u>Public Participation in Local Agenda 21: A Review of Traditional and Innovative Tools</u>
CLIM	18.2001	<i>Johan ALBRECHT and Niko GOBBIN:</i> <u>Schumpeter and the Rise of Modern Environmentalism</u>
VOL	19.2001	<i>Rinaldo BRAU, Carlo CARRARO and Giulio GOLFETTO (xliii):</i> <u>Participation Incentives and the Design of Voluntary Agreements</u>
ETA	20.2001	<i>Paola ROTA:</i> <u>Dynamic Labour Demand with Lumpy and Kinked Adjustment Costs</u>
ETA	21.2001	<i>Paola ROTA:</i> <u>Empirical Representation of Firms' Employment Decisions by an (S,s) Rule</u>
ETA	22.2001	<i>Paola ROTA:</i> <u>What Do We Gain by Being Discrete? An Introduction to the Econometrics of Discrete Decision Processes</u>
PRIV	23.2001	<i>Stefano BOSI, Guillaume GIRMANS and Michel GUILLARD:</i> <u>Optimal Privatisation Design and Financial Markets</u>
KNOW	24.2001	<i>Giorgio BRUNELLO, Claudio LUPI, Patrizia ORDINE, and Maria Luisa PARISI:</i> <u>Beyond National Institutions: Labour Taxes and Regional Unemployment in Italy</u>
ETA	25.2001	<i>Klaus CONRAD:</i> <u>Locational Competition under Environmental Regulation when Input Prices and Productivity Differ</u>
PRIV	26.2001	<i>Bernardo BORTOLOTTI, Juliet D'SOUZA, Marcella FANTINI and William L. MEGGINSON:</i> <u>Sources of Performance Improvement in Privatised Firms: A Clinical Study of the Global Telecommunications Industry</u>
CLIM	27.2001	<i>Frédéric BROCHIER and Emiliano RAMIERI:</i> <u>Climate Change Impacts on the Mediterranean Coastal Zones</u>
ETA	28.2001	<i>Nunzio CAPPUCCIO and Michele MORETTO:</i> <u>Comments on the Investment-Uncertainty Relationship in a Real Option Model</u>
KNOW	29.2001	<i>Giorgio BRUNELLO:</i> <u>Absolute Risk Aversion and the Returns to Education</u>
CLIM	30.2001	<i>ZhongXiang ZHANG:</i> <u>Meeting the Kyoto Targets: The Importance of Developing Country Participation</u>
ETA	31.2001	<i>Jonathan D. KAPLAN, Richard E. HOWITT and Y. Hossein FARZIN:</i> <u>An Information-Theoretical Analysis of Budget-Constrained Nonpoint Source Pollution Control</u>
MGMT Coalition Theory Network	32.2001	<i>Roberta SALOMONE and Giulia GALLUCCIO:</i> <u>Environmental Issues and Financial Reporting Trends</u>
ETA	33.2001	<i>Shlomo WEBER and Hans WIESMETH:</i> <u>From Autarky to Free Trade: The Impact on Environment</u>
ETA	34.2001	<i>Margarita GENIUS and Elisabetta STRAZZERA:</i> <u>Model Selection and Tests for Non Nested Contingent Valuation Models: An Assessment of Methods</u>

NRM	35.2001	<i>Carlo GIUPPONI</i> : <u>The Substitution of Hazardous Molecules in Production Processes: The Atrazine Case Study in Italian Agriculture</u>
KNOW	36.2001	<i>Raffaele PACI and Francesco PIGLIARU</i> : <u>Technological Diffusion, Spatial Spillovers and Regional Convergence in Europe</u>
PRIV	37.2001	<i>Bernardo BORTOLOTTI</i> : <u>Privatisation, Large Shareholders, and Sequential Auctions of Shares</u>
CLIM	38.2001	<i>Barbara BUCHNER</i> : <u>What Really Happened in The Hague? Report on the COP6, Part I, 13-25 November 2000, The Hague, The Netherlands</u>
PRIV	39.2001	<i>Giacomo CALZOLARI and Carlo SCARPA</i> : <u>Regulation at Home, Competition Abroad: A Theoretical Framework</u>
KNOW	40.2001	<i>Giorgio BRUNELLO</i> : <u>On the Complementarity between Education and Training in Europe</u>
Coalition	41.2001	<i>Alain DESDOIGTS and Fabien MOIZEAU</i> (xlv): <u>Multiple Politico-Economic Regimes, Inequality and Growth</u>
Theory		
Network		
Coalition	42.2001	<i>Parkash CHANDER and Henry TULKENS</i> (xlv): <u>Limits to Climate Change</u>
Theory		
Network		
Coalition	43.2001	<i>Michael FINUS and Bianca RUNDSHAGEN</i> (xlv): <u>Endogenous Coalition Formation in Global Pollution Control</u>
Theory		
Network		
Coalition	44.2001	<i>Wietze LISE, Richard S.J. TOL and Bob van der ZWAAN</i> (xlv): <u>Negotiating Climate Change as a Social Situation</u>
Theory		
Network		
NRM	45.2001	<i>Mohamad R. KHAWLIE</i> (xlvii): <u>The Impacts of Climate Change on Water Resources of Lebanon- Eastern Mediterranean</u>
NRM	46.2001	<i>Mutasem EL-FADEL and E. BOU-ZEID</i> (xlvii): <u>Climate Change and Water Resources in the Middle East: Vulnerability, Socio-Economic Impacts and Adaptation</u>
NRM	47.2001	<i>Eva IGLESIAS, Alberto GARRIDO and Almudena GOMEZ</i> (xlvii): <u>An Economic Drought Management Index to Evaluate Water Institutions' Performance Under Uncertainty and Climate Change</u>
CLIM	48.2001	<i>Wietze LISE and Richard S.J. TOL</i> (xlvii): <u>Impact of Climate on Tourist Demand</u>
CLIM	49.2001	<i>Francesco BOSELLO, Barbara BUCHNER, Carlo CARRARO and Davide RAGGI</i> : <u>Can Equity Enhance Efficiency? Lessons from the Kyoto Protocol</u>
SUST	50.2001	<i>Roberto ROSON</i> (xlviii): <u>Carbon Leakage in a Small Open Economy with Capital Mobility</u>
SUST	51.2001	<i>Edwin WOERDMAN</i> (xlviii): <u>Developing a European Carbon Trading Market: Will Permit Allocation Distort Competition and Lead to State Aid?</u>
SUST	52.2001	<i>Richard N. COOPER</i> (xlviii): <u>The Kyoto Protocol: A Flawed Concept</u>
SUST	53.2001	<i>Kari KANGAS</i> (xlviii): <u>Trade Liberalisation, Changing Forest Management and Roundwood Trade in Europe</u>
SUST	54.2001	<i>Xueqin ZHU and Ekko VAN IERLAND</i> (xlviii): <u>Effects of the Enlargement of EU on Trade and the Environment</u>
SUST	55.2001	<i>M. Ozgur KAYALICA and Sajal LAHIRI</i> (xlviii): <u>Strategic Environmental Policies in the Presence of Foreign Direct Investment</u>
SUST	56.2001	<i>Savas ALPAY</i> (xlviii): <u>Can Environmental Regulations be Compatible with Higher International Competitiveness? Some New Theoretical Insights</u>
SUST	57.2001	<i>Roldan MURADIAN, Martin O'CONNOR, Joan MARTINEZ-ALER</i> (xlviii): <u>Embodied Pollution in Trade: Estimating the "Environmental Load Displacement" of Industrialised Countries</u>
SUST	58.2001	<i>Matthew R. AUER and Rafael REUVENY</i> (xlviii): <u>Foreign Aid and Direct Investment: Key Players in the Environmental Restoration of Central and Eastern Europe</u>
SUST	59.2001	<i>Onno J. KUIK and Frans H. OOSTERHUIS</i> (xlviii): <u>Lessons from the Southern Enlargement of the EU for the Environmental Dimensions of Eastern Enlargement, in particular for Poland</u>
ETA	60.2001	<i>Carlo CARRARO, Alessandra POME and Domenico SINISCALCO</i> (xlix): <u>Science vs. Profit in Research: Lessons from the Human Genome Project</u>
CLIM	61.2001	<i>Efrem CASTELNUOVO, Michele MORETTO and Sergio VERGALLI</i> : <u>Global Warming, Uncertainty and Endogenous Technical Change: Implications for Kyoto</u>
PRIV	62.2001	<i>Gian Luigi ALBANO, Fabrizio GERMANO and Stefano LOVO</i> : <u>On Some Collusive and Signaling Equilibria in Ascending Auctions for Multiple Objects</u>
CLIM	63.2001	<i>Elbert DIJKGRAAF and Herman R.J. VOLLEBERGH</i> : <u>A Note on Testing for Environmental Kuznets Curves with Panel Data</u>
CLIM	64.2001	<i>Paolo BUONANNO, Carlo CARRARO and Marzio GALEOTTI</i> : <u>Endogenous Induced Technical Change and the Costs of Kyoto</u>
CLIM	65.2001	<i>Guido CAZZAVILLAN and Ignazio MUSU</i> (l): <u>Transitional Dynamics and Uniqueness of the Balanced-Growth Path in a Simple Model of Endogenous Growth with an Environmental Asset</u>
CLIM	66.2001	<i>Giovanni BAIOCCHI and Salvatore DI FALCO</i> (l): <u>Investigating the Shape of the EKC: A Nonparametric Approach</u>
CLIM	67.2001	<i>Marzio GALEOTTI, Alessandro LANZA and Francesco PAULI</i> (l): <u>Desperately Seeking (Environmental) Kuznets: A New Look at the Evidence</u>
CLIM	68.2001	<i>Alexey VIKHLYAEV</i> (xlviii): <u>The Use of Trade Measures for Environmental Purposes – Globally and in the EU Context</u>
NRM	69.2001	<i>Gary D. LIBECAP and Zeynep K. HANSEN</i> (li): <u>U.S. Land Policy, Property Rights, and the Dust Bowl of the 1930s</u>

NRM	70.2001	<i>Lee J. ALSTON, Gary D. LIBECAP and Bernardo MUELLER</i> (li): <u>Land Reform Policies. The Sources of Violent Conflict and Implications for Deforestation in the Brazilian Amazon</u>
CLIM	71.2001	<i>Claudia KEMFERT</i> : <u>Economy-Energy-Climate Interaction – The Model WIAGEM -</u>
SUST	72.2001	<i>Paulo A.L.D. NUNES and Yohanes E. RIYANTO</i> : <u>Policy Instruments for Creating Markets for Biodiversity: Certification and Ecolabeling</u>
SUST	73.2001	<i>Paulo A.L.D. NUNES and Erik SCHOKKAERT</i> (lii): <u>Warm Glow and Embedding in Contingent Valuation</u>
SUST	74.2001	<i>Paulo A.L.D. NUNES, Jeroen C.J.M. van den BERGH and Peter NIJKAMP</i> (lii): <u>Ecological-Economic Analysis and Valuation of Biodiversity</u>
VOL	75.2001	<i>Johan EYCKMANS and Henry TULKENS</i> (li): <u>Simulating Coalitionally Stable Burden Sharing Agreements for the Climate Change Problem</u>
PRIV	76.2001	<i>Axel GAUTIER and Florian HEIDER</i> : <u>What Do Internal Capital Markets Do? Redistribution vs. Incentives</u>
PRIV	77.2001	<i>Bernardo BORTOLOTTI, Marcella FANTINI and Domenico SINISCALCO</i> : <u>Privatisation around the World: New Evidence from Panel Data</u>
ETA	78.2001	<i>Toke S. AIDT and Jayasri DUTTA</i> (li): <u>Transitional Politics. Emerging Incentive-based Instruments in Environmental Regulation</u>
ETA	79.2001	<i>Alberto PETRUCCI</i> : <u>Consumption Taxation and Endogenous Growth in a Model with New Generations</u>
ETA	80.2001	<i>Pierre LASSERRE and Antoine SOUBEYRAN</i> (li): <u>A Ricardian Model of the Tragedy of the Commons</u>
ETA	81.2001	<i>Pierre COURTOIS, Jean Christophe PÉREAU and Tarik TAZDAÏT</i> : <u>An Evolutionary Approach to the Climate Change Negotiation Game</u>
NRM	82.2001	<i>Christophe BONTEMPS, Stéphane COUTURE and Pascal FAVARD</i> : <u>Is the Irrigation Water Demand Really Convex?</u>
NRM	83.2001	<i>Unai PASCUAL and Edward BARBIER</i> : <u>A Model of Optimal Labour and Soil Use with Shifting Cultivation</u>
CLIM	84.2001	<i>Jesper JENSEN and Martin Hvidt THELLE</i> : <u>What are the Gains from a Multi-Gas Strategy?</u>
CLIM	85.2001	<i>Maurizio MICHELINI</i> (liii): IPCC “Summary for Policymakers” in TAR. <u>Do its results give a scientific support always adequate to the urgencies of Kyoto negotiations?</u>
CLIM	86.2001	<i>Claudia KEMFERT</i> (liii): <u>Economic Impact Assessment of Alternative Climate Policy Strategies</u>
CLIM	87.2001	<i>Cesare DOSI and Michele MORETTO</i> : <u>Global Warming and Financial Umbrellas</u>
ETA	88.2001	<i>Elena BONTEMPI, Alessandra DEL BOCA, Alessandra FRANZOSI, Marzio GALEOTTI and Paola ROTA</i> : <u>Capital Heterogeneity: Does it Matter? Fundamental Q and Investment on a Panel of Italian Firms</u>
ETA	89.2001	<i>Efrem CASTELNUOVO and Paolo SURICO</i> : <u>Model Uncertainty, Optimal Monetary Policy and the Preferences of the Fed</u>
CLIM	90.2001	<i>Umberto CIORBA, Alessandro LANZA and Francesco PAULI</i> : <u>Kyoto Protocol and Emission Trading: Does the US Make a Difference?</u>
CLIM	91.2001	<i>ZhongXiang ZHANG and Lucas ASSUNCAO</i> : <u>Domestic Climate Policies and the WTO</u>
SUST	92.2001	<i>Anna ALBERINI, Alan KRUPNICK, Maureen CROPPER, Nathalie SIMON and Joseph COOK</i> (lii): <u>The Willingness to Pay for Mortality Risk Reductions: A Comparison of the United States and Canada</u>
SUST	93.2001	<i>Riccardo SCARPA, Guy D. GARROD and Kenneth G. WILLIS</i> (lii): <u>Valuing Local Public Goods with Advanced Stated Preference Models: Traffic Calming Schemes in Northern England</u>
CLIM	94.2001	<i>Ming CHEN and Larry KARP</i> : <u>Environmental Indices for the Chinese Grain Sector</u>
CLIM	95.2001	<i>Larry KARP and Jiangfeng ZHANG</i> : <u>Controlling a Stock Pollutant with Endogenous Investment and Asymmetric Information</u>
ETA	96.2001	<i>Michele MORETTO and Gianpaolo ROSSINI</i> : <u>On the Opportunity Cost of Nontradable Stock Options</u>
SUST	97.2001	<i>Elisabetta STRAZZERA, Margarita GENIUS, Riccardo SCARPA and George HUTCHINSON</i> : <u>The Effect of Protest Votes on the Estimates of Willingness to Pay for Use Values of Recreational Sites</u>
NRM	98.2001	<i>Frédéric BROCHIER, Carlo GIUPPONI and Alberto LONGO</i> : <u>Integrated Coastal Zone Management in the Venice Area – Perspectives of Development for the Rural Island of Sant’Erasmus</u>
NRM	99.2001	<i>Frédéric BROCHIER, Carlo GIUPPONI and Julie SORS</i> : <u>Integrated Coastal Management in the Venice Area – Potentials of the Integrated Participatory Management Approach</u>
NRM	100.2001	<i>Frédéric BROCHIER and Carlo GIUPPONI</i> : <u>Integrated Coastal Zone Management in the Venice Area – A Methodological Framework</u>
PRIV	101.2001	<i>Enrico C. PEROTTI and Luc LAEVEN</i> : <u>Confidence Building in Emerging Stock Markets</u>
CLIM	102.2001	<i>Barbara BUCHNER, Carlo CARRARO and Igor CERSOSIMO</i> : <u>On the Consequences of the U.S. Withdrawal from the Kyoto/Bonn Protocol</u>
SUST	103.2001	<i>Riccardo SCARPA, Adam DRUCKER, Simon ANDERSON, Nancy FERRAES-EHUAN, Veronica GOMEZ, Carlos R. RISOPATRON and Olga RUBIO-LEONEL</i> : <u>Valuing Animal Genetic Resources in Peasant Economies: The Case of the Box Keken Creole Pig in Yucatan</u>
SUST	104.2001	<i>R. SCARPA, P. KRISTJANSON, A. DRUCKER, M. RADENY, E.S.K. RUTO, and J.E.O. REGE</i> : <u>Valuing Indigenous Cattle Breeds in Kenya: An Empirical Comparison of Stated and Revealed Preference Value Estimates</u>
SUST	105.2001	<i>Clemens B.A. WOLLNY</i> : <u>The Need to Conserve Farm Animal Genetic Resources Through Community-Based Management in Africa: Should Policy Makers be Concerned?</u>
SUST	106.2001	<i>J.T. KARUGIA, O.A. MWAI, R. KAITHO, Adam G. DRUCKER, C.B.A. WOLLNY and J.E.O. REGE</i> : <u>Economic Analysis of Crossbreeding Programmes in Sub-Saharan Africa: A Conceptual Framework and Kenyan Case Study</u>
SUST	107.2001	<i>W. AYALEW, J.M. KING, E. BRUNS and B. RISCHKOWSKY</i> : <u>Economic Evaluation of Smallholder Subsistence Livestock Production: Lessons from an Ethiopian Goat Development Program</u>

SUST	108.2001	<i>Gianni CICA, Elisabetta D'ERCOLE and Davide MARINO: <u>Valuing Farm Animal Genetic Resources by Means of Contingent Valuation and a Bio-Economic Model: The Case of the Pentro Horse</u></i>
SUST	109.2001	<i>Clem TISDELL: <u>Socioeconomic Causes of Loss of Animal Genetic Diversity: Analysis and Assessment</u></i>
SUST	110.2001	<i>M.A. JABBAR and M.L. DIEDHOU: <u>Does Breed Matter to Cattle Farmers and Buyers? Evidence from West Africa</u></i>
SUST	1.2002	<i>K. TANO, M.D. FAMINOW, M. KAMUANGA and B. SWALLOW: <u>Using Conjoint Analysis to Estimate Farmers' Preferences for Cattle Traits in West Africa</u></i>
ETA	2.2002	<i>Efrem CASTELNUOVO and Paolo SURICO: <u>What Does Monetary Policy Reveal about Central Bank's Preferences?</u></i>
WAT	3.2002	<i>Duncan KNOWLER and Edward BARBIER: <u>The Economics of a "Mixed Blessing" Effect: A Case Study of the Black Sea</u></i>
CLIM	4.2002	<i>Andreas LÖSCHEL: <u>Technological Change in Economic Models of Environmental Policy: A Survey</u></i>
VOL	5.2002	<i>Carlo CARRARO and Carmen MARCHIORI: <u>Stable Coalitions</u></i>
CLIM	6.2002	<i>Marzio GALEOTTI, Alessandro LANZA and Matteo MANERA: <u>Rockets and Feathers Revisited: An International Comparison on European Gasoline Markets</u></i>
ETA	7.2002	<i>Effrosyni DIAMANTOUDI and Eftichios S. SARTZETAKIS: <u>Stable International Environmental Agreements: An Analytical Approach</u></i>
KNOW	8.2002	<i>Alain DESDOIGTS: <u>Neoclassical Convergence Versus Technological Catch-up: A Contribution for Reaching a Consensus</u></i>
NRM	9.2002	<i>Giuseppe DI VITA: <u>Renewable Resources and Waste Recycling</u></i>
KNOW	10.2002	<i>Giorgio BRUNELLO: <u>Is Training More Frequent when Wage Compression is Higher? Evidence from 11 European Countries</u></i>
ETA	11.2002	<i>Mordecai KURZ, Hehui JIN and Maurizio MOTOLESE: <u>Endogenous Fluctuations and the Role of Monetary Policy</u></i>
KNOW	12.2002	<i>Reyer GERLAGH and Marjan W. HOFKES: <u>Escaping Lock-in: The Scope for a Transition towards Sustainable Growth?</u></i>
NRM	13.2002	<i>Michele MORETTO and Paolo ROSATO: <u>The Use of Common Property Resources: A Dynamic Model</u></i>
CLIM	14.2002	<i>Philippe QUIRION: <u>Macroeconomic Effects of an Energy Saving Policy in the Public Sector</u></i>
CLIM	15.2002	<i>Roberto ROSON: <u>Dynamic and Distributional Effects of Environmental Revenue Recycling Schemes: Simulations with a General Equilibrium Model of the Italian Economy</u></i>
CLIM	16.2002	<i>Francesco RICCI (I): <u>Environmental Policy Growth when Inputs are Differentiated in Pollution Intensity</u></i>
ETA	17.2002	<i>Alberto PETRUCCI: <u>Devaluation (Levels versus Rates) and Balance of Payments in a Cash-in-Advance Economy</u></i>
Coalition Theory Network	18.2002	<i>László Á. KÓCZY (liv): <u>The Core in the Presence of Externalities</u></i>
Coalition Theory Network	19.2002	<i>Steven J. BRAMS, Michael A. JONES and D. Marc KILGOUR (liv): <u>Single-Peakedness and Disconnected Coalitions</u></i>
Coalition Theory Network	20.2002	<i>Guillaume HAERINGER (liv): <u>On the Stability of Cooperation Structures</u></i>
NRM	21.2002	<i>Fausto CAVALLARO and Luigi CIRAULO: <u>Economic and Environmental Sustainability: A Dynamic Approach in Insular Systems</u></i>
CLIM	22.2002	<i>Barbara BUCHNER, Carlo CARRARO, Igor CERSOSIMO and Carmen MARCHIORI: <u>Back to Kyoto? US Participation and the Linkage between R&amp;D and Climate Cooperation</u></i>
CLIM	23.2002	<i>Andreas LÖSCHEL and ZhongXIANG ZHANG: <u>The Economic and Environmental Implications of the US Repudiation of the Kyoto Protocol and the Subsequent Deals in Bonn and Marrakech</u></i>
ETA	24.2002	<i>Marzio GALEOTTI, Louis J. MACCINI and Fabio SCHIANTARELLI: <u>Inventories, Employment and Hours</u></i>
CLIM	25.2002	<i>Hannes EGLI: <u>Are Cross-Country Studies of the Environmental Kuznets Curve Misleading? New Evidence from Time Series Data for Germany</u></i>
ETA	26.2002	<i>Adam B. JAFFE, Richard G. NEWELL and Robert N. STAVINS: <u>Environmental Policy and Technological Change</u></i>
SUST	27.2002	<i>Joseph C. COOPER and Giovanni SIGNORELLO: <u>Farmer Premiums for the Voluntary Adoption of Conservation Plans</u></i>
SUST	28.2002	<i>The ANSEA Network: <u>Towards An Analytical Strategic Environmental Assessment</u></i>
KNOW	29.2002	<i>Paolo SURICO: <u>Geographic Concentration and Increasing Returns: a Survey of Evidence</u></i>
ETA	30.2002	<i>Robert N. STAVINS: <u>Lessons from the American Experiment with Market-Based Environmental Policies</u></i>
NRM	31.2002	<i>Carlo GIUPPONI and Paolo ROSATO: <u>Multi-Criteria Analysis and Decision-Support for Water Management at the Catchment Scale: An Application to Diffuse Pollution Control in the Venice Lagoon</u></i>
NRM	32.2002	<i>Robert N. STAVINS: <u>National Environmental Policy During the Clinton Years</u></i>
KNOW	33.2002	<i>A. SOUBEYRAN and H. STAHN : <u>Do Investments in Specialized Knowledge Lead to Composite Good Industries?</u></i>
KNOW	34.2002	<i>G. BRUNELLO, M.L. PARISI and Daniela SONEDDA: <u>Labor Taxes, Wage Setting and the Relative Wage Effect</u></i>
CLIM	35.2002	<i>C. BOEMARE and P. QUIRION (lv): <u>Implementing Greenhouse Gas Trading in Europe: Lessons from Economic Theory and International Experiences</u></i>



CLIM	36.2002	<i>T. TIETENBERG</i> (lv): <u>The Tradable Permits Approach to Protecting the Commons: What Have We Learned?</u>
CLIM	37.2002	<i>K. REHDANZ and R.J.S. TOL</i> (lv): <u>On National and International Trade in Greenhouse Gas Emission Permits</u>
CLIM	38.2002	<i>C. FISCHER</i> (lv): <u>Multinational Taxation and International Emissions Trading</u>
SUST	39.2002	<i>G. SIGNORELLO and G. PAPPALARDO</i> : <u>Farm Animal Biodiversity Conservation Activities in Europe under the Framework of Agenda 2000</u>
NRM	40.2002	<i>S.M. CAVANAGH, W. M. HANEMANN and R. N. STAVINS</i> : <u>Muffled Price Signals: Household Water Demand under Increasing-Block Prices</u>
NRM	41.2002	<i>A. J. PLANTINGA, R. N. LUBOWSKI and R. N. STAVINS</i> : <u>The Effects of Potential Land Development on Agricultural Land Prices</u>
CLIM	42.2002	<i>C. OHL</i> (lvi): <u>Inducing Environmental Co-operation by the Design of Emission Permits</u>
CLIM	43.2002	<i>J. EYCKMANS, D. VAN REGEMORTER and V. VAN STEENBERGHE</i> (lvi): <u>Is Kyoto Fatally Flawed? An Analysis with MacGEM</u>
CLIM	44.2002	<i>A. ANTOCI and S. BORGHESI</i> (lvi): <u>Working Too Much in a Polluted World: A North-South Evolutionary Model</u>
ETA	45.2002	<i>P. G. FREDRIKSSON, Johan A. LIST and Daniel MILLIMET</i> (lvi): <u>Chasing the Smokestack: Strategic Policymaking with Multiple Instruments</u>
ETA	46.2002	<i>Z. YU</i> (lvi): <u>A Theory of Strategic Vertical DFI and the Missing Pollution-Haven Effect</u>
SUST	47.2002	<i>Y. H. FARZIN</i> : <u>Can an Exhaustible Resource Economy Be Sustainable?</u>
SUST	48.2002	<i>Y. H. FARZIN</i> : <u>Sustainability and Hamiltonian Value</u>
KNOW	49.2002	<i>C. PIGA and M. VIVARELLI</i> : <u>Cooperation in R&amp;D and Sample Selection</u>
Coalition	50.2002	<i>M. SERTEL and A. SLINKO</i> (liv): <u>Ranking Committees, Words or Multisets</u>
Theory		
Network		
Coalition	51.2002	<i>Sergio CURRARINI</i> (liv): <u>Stable Organizations with Externalities</u>
Theory		
Network		
ETA	52.2002	<i>Robert N. STAVINS</i> : <u>Experience with Market-Based Policy Instruments</u>
ETA	53.2002	<i>C.C. JAEGER, M. LEIMBACH, C. CARRARO, K. HASSELMANN, J.C. HOURCADE, A. KEELER and R. KLEIN</i> (liii): <u>Integrated Assessment Modeling: Modules for Cooperation</u>
CLIM	54.2002	<i>Scott BARRETT</i> (liii): <u>Towards a Better Climate Treaty</u>
ETA	55.2002	<i>Richard G. NEWELL and Robert N. STAVINS</i> : <u>Cost Heterogeneity and the Potential Savings from Market-Based Policies</u>
SUST	56.2002	<i>Paolo ROSATO and Edi DEFRANCESCO</i> : <u>Individual Travel Cost Method and Flow Fixed Costs</u>
SUST	57.2002	<i>Vladimir KOTOV and Elena NIKITINA</i> (lvii): <u>Reorganisation of Environmental Policy in Russia: The Decade of Success and Failures in Implementation of Perspective Quests</u>
SUST	58.2002	<i>Vladimir KOTOV</i> (lvii): <u>Policy in Transition: New Framework for Russia's Climate Policy</u>
SUST	59.2002	<i>Fanny MISSFELDT and Arturo VILLAVICENCO</i> (lvii): <u>How Can Economies in Transition Pursue Emissions Trading or Joint Implementation?</u>
VOL	60.2002	<i>Giovanni DI BARTOLOMEO, Jacob ENGWERDA, Joseph PLASMANS and Bas VAN AARLE</i> : <u>Staying Together or Breaking Apart: Policy-Makers' Endogenous Coalitions Formation in the European Economic and Monetary Union</u>
ETA	61.2002	<i>Robert N. STAVINS, Alexander F. WAGNER and Gernot WAGNER</i> : <u>Interpreting Sustainability in Economic Terms: Dynamic Efficiency Plus Intergenerational Equity</u>
PRIV	62.2002	<i>Carlo CAPUANO</i> : <u>Demand Growth, Entry and Collusion Sustainability</u>
PRIV	63.2002	<i>Federico MUNARI and Raffaele ORIANI</i> : <u>Privatization and R&amp;D Performance: An Empirical Analysis Based on Tobin's Q</u>
PRIV	64.2002	<i>Federico MUNARI and Maurizio SOBRERO</i> : <u>The Effects of Privatization on R&amp;D Investments and Patent Productivity</u>
SUST	65.2002	<i>Orley ASHENFELTER and Michael GREENSTONE</i> : <u>Using Mandated Speed Limits to Measure the Value of a Statistical Life</u>
ETA	66.2002	<i>Paolo SURICO</i> : <u>US Monetary Policy Rules: the Case for Asymmetric Preferences</u>
PRIV	67.2002	<i>Rinaldo BRAU and Massimo FLORIO</i> : <u>Privatisations as Price Reforms: Evaluating Consumers' Welfare Changes in the U.K.</u>
CLIM	68.2002	<i>Barbara K. BUCHNER and Roberto ROSON</i> : <u>Conflicting Perspectives in Trade and Environmental Negotiations</u>
CLIM	69.2002	<i>Philippe QUIRION</i> : <u>Complying with the Kyoto Protocol under Uncertainty: Taxes or Tradable Permits?</u>
SUST	70.2002	<i>Anna ALBERINI, Patrizia RIGANTI and Alberto LONGO</i> : <u>Can People Value the Aesthetic and Use Services of Urban Sites? Evidence from a Survey of Belfast Residents</u>
SUST	71.2002	<i>Marco PERCOCO</i> : <u>Discounting Environmental Effects in Project Appraisal</u>
NRM	72.2002	<i>Philippe BONTEMS and Pascal FAVARD</i> : <u>Input Use and Capacity Constraint under Uncertainty: The Case of Irrigation</u>
PRIV	73.2002	<i>Mohammed OMRAN</i> : <u>The Performance of State-Owned Enterprises and Newly Privatized Firms: Empirical Evidence from Egypt</u>
PRIV	74.2002	<i>Mike BURKART, Fausto PANUNZI and Andrei SHLEIFER</i> : <u>Family Firms</u>
PRIV	75.2002	<i>Emmanuelle AURIOL, Pierre M. PICARD</i> : <u>Privatizations in Developing Countries and the Government Budget Constraint</u>
PRIV	76.2002	<i>Nichole M. CASTATER</i> : <u>Privatization as a Means to Societal Transformation: An Empirical Study of Privatization in Central and Eastern Europe and the Former Soviet Union</u>

PRIV	77.2002	<i>Christoph LÜLSFESMANN</i> : <u>Benevolent Government, Managerial Incentives, and the Virtues of Privatization</u>
PRIV	78.2002	<i>Kate BISHOP, Igor FILATOTCHEV and Tomasz MICKIEWICZ</i> : <u>Endogenous Ownership Structure: Factors Affecting the Post-Privatisation Equity in Largest Hungarian Firms</u>
PRIV	79.2002	<i>Theodora WELCH and Rick MOLZ</i> : <u>How Does Trade Sale Privatization Work? Evidence from the Fixed-Line Telecommunications Sector in Developing Economies</u>
PRIV	80.2002	<i>Alberto R. PETRUCCI</i> : <u>Government Debt, Agent Heterogeneity and Wealth Displacement in a Small Open Economy</u>
CLIM	81.2002	<i>Timothy SWANSON and Robin MASON</i> (Ivi): <u>The Impact of International Environmental Agreements: The Case of the Montreal Protocol</u>
PRIV	82.2002	<i>George R.G. CLARKE and Lixin Colin XU</i> : <u>Privatization, Competition and Corruption: How Characteristics of Bribe Takers and Payers Affect Bribe Payments to Utilities</u>
PRIV	83.2002	<i>Massimo FLORIO and Katuscia MANZONI</i> : <u>The Abnormal Returns of UK Privatisations: From Underpricing to Outperformance</u>

(xlii) This paper was presented at the International Workshop on "Climate Change and Mediterranean Coastal Systems: Regional Scenarios and Vulnerability Assessment" organised by the Fondazione Eni Enrico Mattei in co-operation with the Istituto Veneto di Scienze, Lettere ed Arti, Venice, December 9-10, 1999.

(xliii) This paper was presented at the International Workshop on "Voluntary Approaches, Competition and Competitiveness" organised by the Fondazione Eni Enrico Mattei within the research activities of the CAVA Network, Milan, May 25-26, 2000.

(xliv) This paper was presented at the International Workshop on "Green National Accounting in Europe: Comparison of Methods and Experiences" organised by the Fondazione Eni Enrico Mattei within the Concerted Action of Environmental Valuation in Europe (EVE), Milan, March 4-7, 2000

(xlv) This paper was presented at the International Workshop on "New Ports and Urban and Regional Development. The Dynamics of Sustainability" organised by the Fondazione Eni Enrico Mattei, Venice, May 5-6, 2000.

(xlvii) This paper was presented at the Sixth Meeting of the Coalition Theory Network organised by the Fondazione Eni Enrico Mattei and the CORE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium, January 26-27, 2001

(xlvii) This paper was presented at the RICAMARE Workshop "Socioeconomic Assessments of Climate Change in the Mediterranean: Impact, Adaptation and Mitigation Co-benefits", organised by the Fondazione Eni Enrico Mattei, Milan, February 9-10, 2001

(xlviii) This paper was presented at the International Workshop "Trade and the Environment in the Perspective of the EU Enlargement", organised by the Fondazione Eni Enrico Mattei, Milan, May 17-18, 2001

(xlix) This paper was presented at the International Conference "Knowledge as an Economic Good", organised by Fondazione Eni Enrico Mattei and The Beijer International Institute of Environmental Economics, Palermo, April 20-21, 2001

(l) This paper was presented at the Workshop "Growth, Environmental Policies and Sustainability" organised by the Fondazione Eni Enrico Mattei, Venice, June 1, 2001

(li) This paper was presented at the Fourth Toulouse Conference on Environment and Resource Economics on "Property Rights, Institutions and Management of Environmental and Natural Resources", organised by Fondazione Eni Enrico Mattei, IDEI and INRA and sponsored by MATE, Toulouse, May 3-4, 2001

(lii) This paper was presented at the International Conference on "Economic Valuation of Environmental Goods", organised by Fondazione Eni Enrico Mattei in cooperation with CORILA, Venice, May 11, 2001

(liii) This paper was circulated at the International Conference on "Climate Policy – Do We Need a New Approach?", jointly organised by Fondazione Eni Enrico Mattei, Stanford University and Venice International University, Isola di San Servolo, Venice, September 6-8, 2001

(liv) This paper was presented at the Seventh Meeting of the Coalition Theory Network organised by the Fondazione Eni Enrico Mattei and the CORE, Université Catholique de Louvain, Venice, Italy, January 11-12, 2002

(lv) This paper was presented at the First Workshop of the Concerted Action on Tradable Emission Permits (CATEP) organised by the Fondazione Eni Enrico Mattei, Venice, Italy, December 3-4, 2001

(lvi) This paper was presented at the ESF EURESCO Conference on Environmental Policy in a Global Economy "The International Dimension of Environmental Policy", organised with the collaboration of the Fondazione Eni Enrico Mattei, Acquafredda di Maratea, October 6-11, 2001

(lvii) This paper was presented at the First Workshop of "CFEWE – Carbon Flows between Eastern and Western Europe", organised by the Fondazione Eni Enrico Mattei and Zentrum für Europäische Integrationsforschung (ZEI), Milan, July 5-6, 2001

## **2002 SERIES**

<b>CLIM</b>	<i>Climate Change Modelling and Policy</i> (Editor: Marzio Galeotti )
<b>NRM</b>	<i>Natural Resources Management</i> (Editor: Carlo Giupponi)
<b>SUST</b>	<i>Sustainability Indicators and Environmental Evaluation</i> (Editor: Carlo Carraro)
<b>KNOW</b>	<i>Knowledge, Technology, Human Capital</i> (Editor: Dino Pinelli)
<b>PRIV</b>	<i>Privatisation, Regulation, Antitrust</i> (Editor: Bernardo Bortolotti)
<b>MGMT</b>	<i>Corporate Sustainable Management</i> (Editor: Andrea Marsanich)
<b>ETA</b>	<i>Economic Theory and Applications</i> (Editor: Carlo Carraro)