Why privatize?
A competition for ownership approach

Private ownership efficiency, ideology, increased competition on equity markets, or differential cost of funds?

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Abstract

Theories of privatization or nationalization typically compare the economic or political efficiency of private and state ownership, either in general, or for a list of specific goods and services. They aim at defining, once and for all, what a normative allocation of ownership should be, i.e. the desirable scope of government. Such attempts however can hardly account for the "big reversal" of post WWII nationalization policies, which gave way to the current privatization wave, initiated in the 1980s. Since what is to be explained is the fluctuating allocation of property rights over firms between private investors and the state, we model a competitive bidding for these rights in which the private investors value shareholders wealth, and the state values political survival, obtained through the transfer of the firm cash flow to various political clienteles. The investors who value the firm most get the rights of control, a privatization or a nationalization, according to which type of investor has the lowest cost of funds. Recent data on privatization amounts in eight countries lend support to our theory.

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I. Introduction

The literature on privatization is now extensive. The explanations for the phenomenon, however, are still at pain to account for the "big reversal" of policies started in the early 80s with the current privatization wave replacing the nationalization wave of the immediate post-WWII[1].

This difficulty arises because all theories of the state ownership of firms try to determine a general best allocation of firms between private owners and the state, - an optimal frontier of the public sector – which should essentially remain the same under all circumstances.

In fact the frontier has been shifting one way or the other, depending on the period considered. The allocation of property rights in firms between private investors and the state has been shifting, and even reverting at times (see for instance footnote 1 below).

A theory explaining these fluctuations of property rights is warranted. It should make explicit the motivation of both private investors and the state as an investor.

While early nationalizations of the XXth century often were confiscatory (a substitute in a way for taxation, as was the case of forcible expropriation by princes and kings for many centuries, see De Long and Shleifer, Princes and Merchants, 1993), in open economies where capital is mobile and governments understand its contribution to wealth creation and growth, the private owners of firms which are nationalized are generally compensated at about market prices (see Langohr and Viallet, "Compensation and wealth transfers in the French nationalizations 1981–1982", 1986). If this is the case, then nationalization can be considered as a market exchange, while privatizations obviously are since private investors' bids are necessarily voluntary.

In this framework the motives of private investors are clear: they expect to increase the wealth of managers and/or shareholders, depending on who effectively controls the firm in the managerial-capitalists agency perspective. The state's motives are not that easily recognized. Most authors assume a benevolent government bent on improving the efficiency of the economy, either by providing public goods, or internalizing externalities, or by increasing the efficiency of management (see the abundant literature on the nationalization's role)[2].

On the contrary, the current wave of privatizations is justified by the assumed superior efficiency of private management over state management. But if this true and always the case, as is implicit in the argument about the virtues of private property, then it becomes exceedingly difficult to explain the previous nationalization wave other than by "mistakes" in government policies or "ideology", which amounts to the same thing since an ideology is a set of ideas which do not rely on scientific truth.

The "ideological" explanation of privatization is especially weak since it assumes both irrationality on the part of deciders and also an unexplained change of "wrong" ideas from one period to another. For instance Megginson and Netter note that "twenty years ago proponents of state ownership could just as easily have surveyed the postwar rise of state-owned

[1] "Thus, there had been a tremendous growth in the use of SOEs throughout much of the world, especially after Wolrd War II, which in turn led to privatization several decades later", Megginson and Netter, p.3.
[2] As Shleifer (1998) describes the scope of benevolent government in "State versus Private Ownership".

enterprises and concluded that their model of economic organization was winning the intellectual battle with free market capitalism".
In the same vein, Shleifer (1998) derides great economists of the past for their positive advocacy of nationalization, and he also adds: …"how the world has changed", from a general preference for government ownership to a general preference for private ownership. Nevertheless, he claims, summarizing much of the literature, that "a good government that wants to further 'social goals' would rarely own producers to meet its objectives".

Why it took more than seventy years (in the case if the Soviet Union) to correct the mistake is a bit mysterious, as well as why these mistakes were not recognized after 25 years (1920-1945) of the soviet experiment when most European governments and even the US government proceeded to nationalize many firms in many sectors of the economy[3].

The efficiency hypothesis is more common but it runs also into serious difficulties. There is a measurement problem in the first place, because assuming that two firms, one private and the other an SOE, obtain the same economic and technical efficiency, they could allocate their surplus revenues (or economic profit) differently, one to pay shareholders, and the other to pay wage premiums. Relying on accounting profits, the SOE would appear much less efficient than the shareholders controlled firm. Megginsson and others (1994) took this problem into account to compare directly the productive efficiency of public and private firms and still found that private firms are more efficient. It could be that the control from owners is more strict when exerted by mobile and competitive shareholders rather than by the monopolistic state which, moreover, detains such a large portfolio of firms, much as a very large conglomerate, that it cannot monitor efficiently the management of each one, especially the smaller ones.

However, even if one accepts the efficiency hypothesis, the question remains of why did the privatization phenomenon occurred at about the same time in many countries, and why not before. One cannot explain the privatization "wave" started in the 80s by a permanent differential in efficiency which was presumably already present during the years of increasing state ownership and nationalization of the thirties, forties, and fifties.

Two lines of argument purport to answer that question. The first is the ideological hypothesis: from the early 80s on, socialism and statism were out while competition and decentralization were in, maybe as a result of the deteriorating performance of the Soviet bloc. This ideological reversal could be explained by delayed learning in the performance of economic systems, or by the changing international economic environment following the tremendous increase in international trade and growing openness of national economies, of which the development of equity markets was one aspect. After all, the move toward flexible exchange rates and open capital markets dates back to the early 70s.

All this is quite plausible but the ideological explanation itself needs to be explained. Did it really take 70 years to realize that central economic planning and monopolistic "state capitalism" was inefficient? Or was the ideological shift "autonomous" and thus basically unexplained? And regarding the opening of the world economy should it be considered only a discretionary political choice by some western governments? It would then lack also of an explanation.

[3] Shleifer (1998) states that the case for government ownership was credible in war, during the great depression, and with the first apparent successes of communism, but that this is no longer the case. He believes that all this was a mistake from the start.

We suggest, along the lines of the theory developed by Rosa (1988, 1993, 1997), that the mystery can be solved when we consider that the government's motive is the same than the private investor's motive: to control the firm's profit or cash flow in order to further one's own interests. In the case of government, the one and major interest is political power and survival. In order to succeed any government (democratic or not) has to transfer some wealth to supporters, on top of consuming resources by itself. Instead of distributing profits to shareholders or retaining resources for the manager, the state as owner uses the firms' resources to grant rents and advantages to selected and useful (to him) clienteles thus aiming at maximizing his chances of staying in power. Thus both types of investors, whether private or government, value firms for the cash flow they produce even though the beneficiaries of the cash flow they have in mind are different.

It follows that since private and government investors are both interested in firms, and if pure expropriations are ruled out, there should be a bidding contest between them for the control of firms, i.e. for the ownership of firms. In such a competition for ownership the highest bidder should prevail. And the highest bidder should be the one who values the firm most. It could be that the private management, controlled by private investors, will be more efficient and will create more profit with a same firm than the government can do, as the present literature currently assumes. However, this may be more apparent than real. As noted by Megginson and Netter (p.15), the superior private management efficiency relies on "the implicit assumption that all firms are cost minimizing, but if state-owned enterprises have other objectives, it is difficult to interpret the meaning of differences in costs". The lower profit of state-owned firms could hide large and useful transfers made to supporting clienteles, which increase costs and decrease registered profits, that make the government ownership as valuable for the state investor, or even more valuable than it could be for the private investor expecting to create a higher profit. The comparison of costs and profits thus becomes meaningless.

The competitive bidding model

To make thing manageable let us assume that government's use of state-owned firms is exclusively based on "official" (accounting) profits, calculated exactly in the same way as profits of the privately owned identical firms. Costs are the same. There are no transfers to political supporters through increased "costs" of the firm. The transfers take place exclusively as allocation of the firms' profits, while costs are minimized. If government management is really less efficient than private management, state-owned firms costs will be higher for any given production by a given coefficient, and the profit is lower by a coefficient λ (<1), but this is not going to change the analysis, nor its conclusions.

In that case the amount of profit that can be extracted from operating the firm, π, is the same for both types of management, or alternatively is $\lambda\pi$ ($< \pi$) for the state-owned firm[4].

[4] One can also assume that either resources extracted from the firm come from profits when the owner is a private investor, as they go to shareholders, or that, equivalently, resources are extracted by increased ("superfluous") costs which benefit some other agents in the supply chain, if the owner is the state, accounting profits then tending towards zero.

Whatever is the case, both type of investors are interested in controlling the firm's cash flow. The highest bidder will be the one that values π most. The value of the firm, V, being the ratio π / k (k being the cost of funds), the differences in valuations depend on the differences in the cost of funds (Rosa, 1993).

If : k private > k state,

Then: V private = (π / k private) < V state = (π / k state)

The government will overbid private investors. Each side will gain from the nationalization.

Conversely, if: k private < k state,

Then: V private = (π / k private) > V state = (π / k state)

The private investor will overbid the government and each side will gain from the privatization.

If the private management is really more efficient than the government management by a factor λ, the inequation is little modified:

V private = (π / k private) > or < V state = (λπ / k state)

Divergences between k private and k state will still determine movements of privatization or nationalization.

Indeed, the cost of funds is structurally different for private investors and for the government, because the first ones obtain funds from issuing equity and bonds, while the second one is financed by bonds and taxes[5]. It follows that the cost of capital of both actors is due to diverge frequently when the cost of equity diverges from the social cost of taxes, and when interest rates, the cost of equity, and the social cost of taxes fluctuate.

Thus, even if the managerial cost efficiency is the same for both private and public owners (an extreme case of our theory which can also include, as an alternative, the case of a superior efficiency of private ownership, as stated above), their respective cost of capital being different, their incentives to buy or sell a given firm are different, thus allowing mutually advantageous trade of ownership rights.

Without any change in efficiency, politics, or ideology, a change of ownership could thus be explained by the fluctuations of the cost of equity capital, interest rates and social cost of taxes[6]. This in turn would explain why privatizations and nationalizations occur in waves but can differ in intensity from one country to another. The frontier is thus susceptible to change radically depending on the varying conditions of the competition for ownership.

[5] The concept of a "weighted average cost of State's fund", similar to the corporate WACC is first used in the Rosa 1988 paper.

[6] The traditional efficiency explanation of nationalization/privatization frontier requires a change in the nature of the goods (private or public in the samuelsonian sense), or a change in externalities and market imperfections (the pigovian approach), a change in the relative efficiency of state and private management, or a change in the political equilibrium of groups and ideology, in order to explain a change of the frontier. All of these are stringent conditions in need of proofs.

We thus have developed an economic theory of the rational, but potentially fluctuating, allocation of ownership between private and state investors, extending the notion of the corporate cost of funds as presented in Rosa's model to include also equity as a source of financing, while the former model relied exclusively on debt finance.

This theory is capable of explaining nationalization and privatization waves without recourse to irrational ideological factors pushing haphazardly one way or the other, or systematic and enduring government "mistakes", which imply at the same time that the assumed superior efficiency of the private management and ownership has been ignored for several decades, all over the world.

It is a theory of the competition for ownership along the same classical lines as competition for ownership among private investors. Privatization being the purchase – at a price – of SOEs by private investors should be considered a rational outcome of current economic conditions. The buyer supposedly expects to get a sufficiently higher return than the current owner to justify her investment at a given price. But the current owner, when it is the government, should also assume that he can obtain more discretionary funds for his political objectives by selling, rather than through continuing ownership of the firm which would allow cross subsidies to political powerful clienteles, be managed by the SOE. If both actors are rational there should exist a difference in managerial ability (the efficiency hypothesis) or in the cost of capital (our hypothesis).

This is the theory we test in this paper on a sample of 8 OECD countries over 15 years of data. We find substantial support for the theory while the impact of ideology is not vindicated.

II. An Optimal Ownership Allocation Model

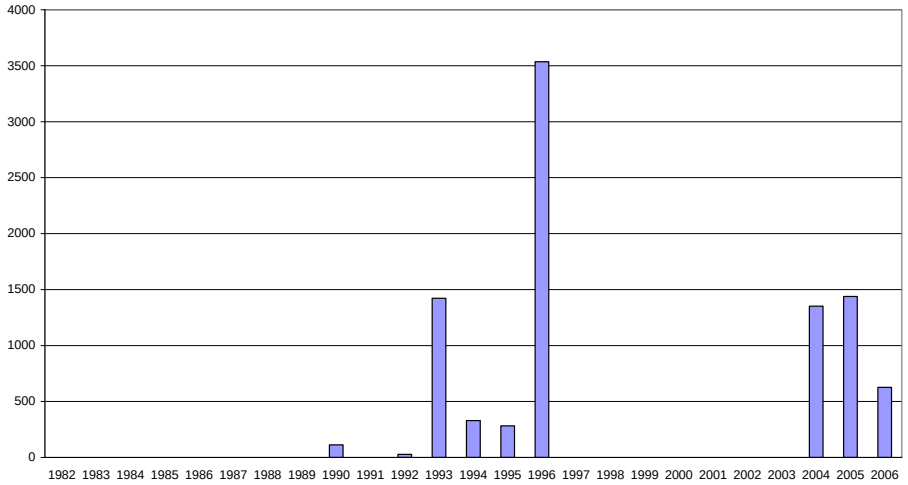
Historically, the privatization movement or "wave" initiated in the 80s reversed the previous trend towards nationalization, especially present in the 40s and 50s (already mentioned above)[7]. However, even during this new privatization phase there has been considerable variation from year to year and from one country to the other, in the amount of privatizations.

The quantitative evidence is reported in the following graphs:

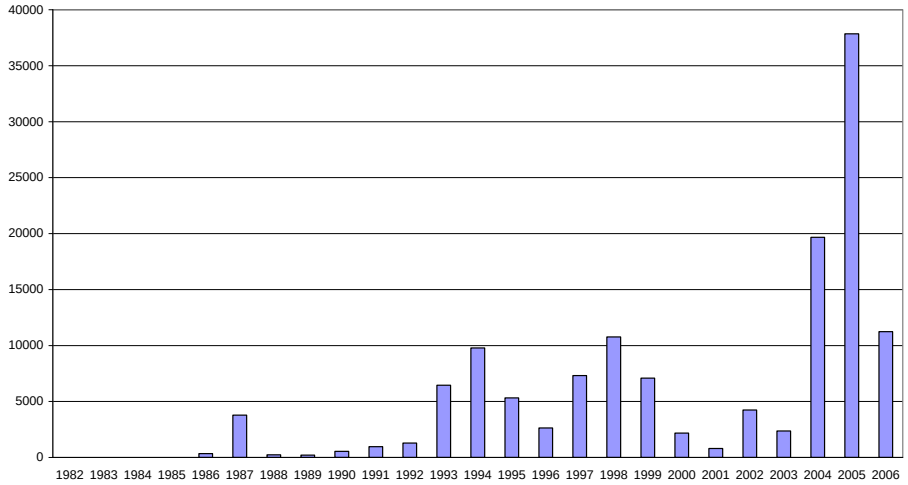
[7] For a historical survey of the privatization wave, succeeding the postwar nationalization trend see Megginson and Netter (2001)

Privatization Waves
Privatization revenues (current US$ mil)

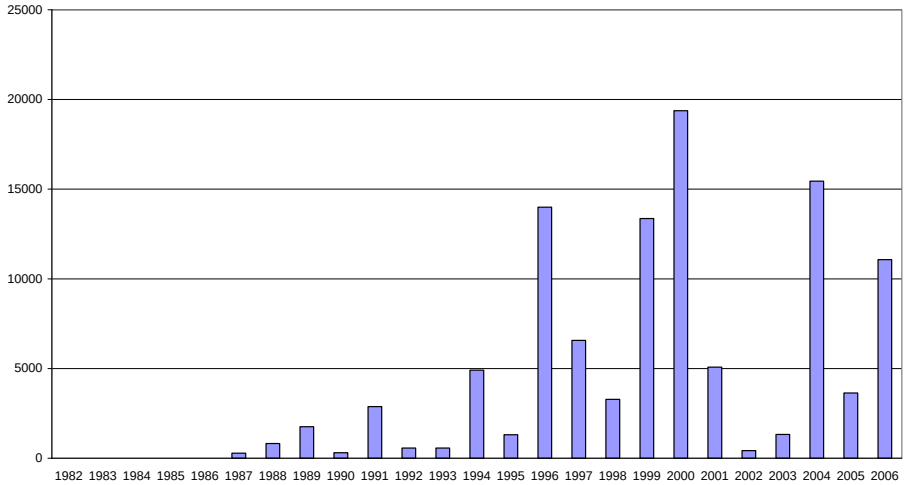
Belgium



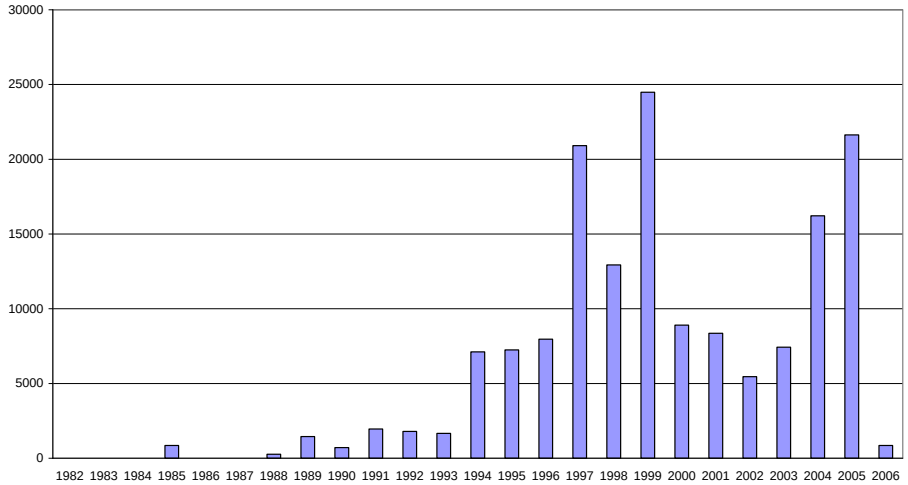
France

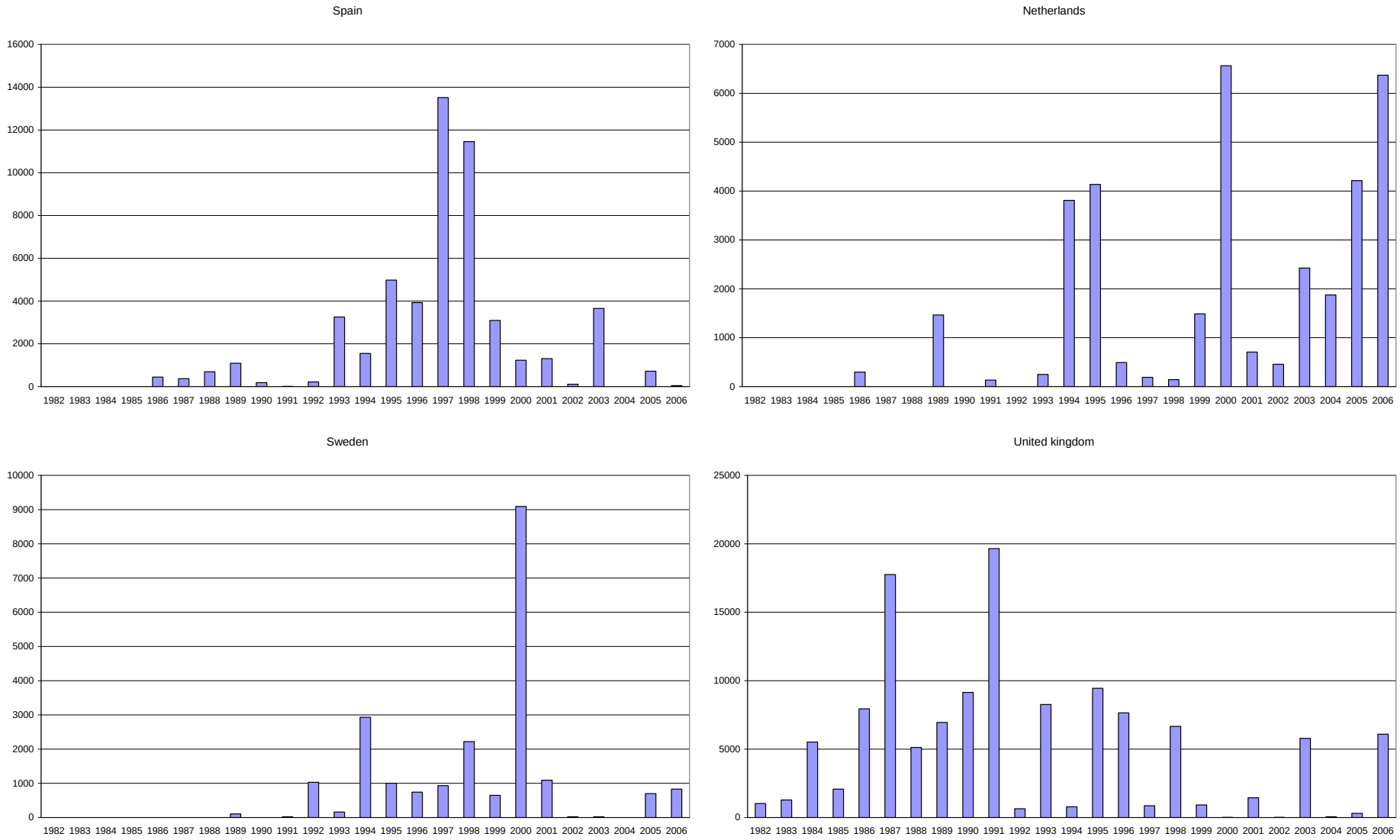


Germany



Italy





Source: E.Pérard, based on data from Privatization Barometer 2007

First, let us assume away the difference of efficiency between the private and the state owners and managers, in order to show that privatization or nationalization could take place nevertheless, between equally efficient managements.

(Note that we could also consider that there is a given difference of efficiency, for instance the efficiency of the private firm always being (100 + X) % of the efficiency of the same firm, state owned. Even with such a premium, a difference in the cost of funds could explain a nationalization, if it sufficiently larger than X).

Under our assumption the profit is the same for both types of owners:

$\prod$: Profit (assumed to be the same for private or state ownership and management)

The value of the same firm, the present value of the identical cash flow, can differ for private or state investors according to differences in the cost of funds for those different investors.
The cost of funds differs because the sources of funds are different and the financial structure of private firms and SOEs is different: private investors rely on shares and bonds, while the state relies on taxes and bonds.

It follows that if:

k : Cost of shareholder's capital
i : Interest rate assumed identical for state and private investors
l : Private leverage
g : Public finance leverage
t : Social cost of taxes

The respective cost of funds for private and state investors, noted "***Cfunds private***" and "***Cfunds state***", are:

$$\textbf{\textit{Cfunds private}} = [(1-l).k + l.i] \qquad (1)$$

$$\textbf{\textit{Cfunds state}} = [(1-g).t + g.i] \qquad (2)$$

It follows that the private and state ownership values, Vp and Vg, <u>of the same firm</u> are:

$$\mathbf{Vp} = \prod / [(1-l).k + l.i] \qquad (3)$$

$$\mathbf{Vg} = \prod / [(1-g).t + g.i] \qquad (4)$$

As usual in the literature on the allocation of property rights in markets, the ownership goes to the highest bidder, the investor who values most the corporation.

When: **Vp** > **Vg** , the state finds an advantage in selling and the private investors in buying. There is a voluntary exchange, a privatization move.

When: **Vp** < **Vg** , there is a nationalization move.

Thus the ratio of private and state valuations, **R**, determines the direction of the exchange of property rights. The private-state frontier fluctuates according to the values of diverse variables in the ratio: *k, i, t, l* and *g*.

$$R = \frac{Vp}{Vg} = \frac{(1 - g)\cdot t + g\cdot i}{(1 - l)\cdot k + l\cdot i} \qquad (5)$$

The ownership equilibrium ratio is 1. The ownership equilibrium is characterized by a ratio **Vp** / **Vg** = 1. For this value both potential owners value the firm equally. No transaction should take place.

We want to know how the fluctuations of the various variables influence **R**.

The influences of the different variables are obtained by differentiating R with respect to the variables around its unitary equilibrium value. The sign of each derivative will determine the privatizing or nationalizing influence of these variables.

A positive derivative means that an increase in the factor's value leads to privatization because the value of the firm for private investors will increase more than the value of the firm for the state. And vice versa for a negative derivative.

III. The derivatives

Influence of the cost of shareholder's capital, k

The derivative of R with respect to ***k*** is:

$$\delta\mathbf{R}/\delta\boldsymbol{k} = \delta\{[(1-g).t + g.i]/[(1-l).k + l.i]\}/\delta k = \frac{-(l-1).[(g-1).t - g.i]}{[k.(l-1) - i.l]^2} \qquad (6)$$

The theoretical sign is negative: an increase in the cost of shareholder's capital leads to nationalization.

Influence of the interest rate, i

The derivative of R with respect to ***i*** is:

$$\delta \mathbf{R} / \delta \boldsymbol{i} = \frac{(g-1).l.t - g.k.(l-1)}{[i.l - k.(l-1)]^2} \qquad (7)$$

Here the sign of the interest rate influence on the ratio R depends on the sign of the following expression: $[(1-l).g.k - (1-g).l.t]$
Which could be positive or negative according to the value of the variables *g, l, t, k.*

If $(1-g).l.t > (1-l).g.k$

the whole derivative is negative and an increase in the interest rate leads to a nationalization.

If, on the other hand, $(1-g).l.t < (1-l).g.k$

the derivative is positive and an increase of the interest rate leads to a privatization.

All depends on the configuration in each time period of the variables *g, l, t, k.*

Influence of private leverage, l

Deriving R with respect to ***l*** gives:

$$\delta \mathbf{R} / \delta \boldsymbol{l} = \frac{(i-k).[(g-1).t - g.i]}{[l.(i-k) + k]^2} \qquad (8)$$

Again the sign of the derivative depends on the value of some variables, here i and k.
If the interest rate is higher than the cost of capital, which is the case in many years, the sign is negative. Then, an increase of the private leverage leads to nationalization. Usually however the equity premium being positive, the sign will be positive and an increase of the private leverage will lead to privatization.

Influence of the public leverage, g

Deriving R with respect to ***g*** gives:

$$\delta \mathbf{R} / \delta \boldsymbol{g} = \frac{-(t-i)}{i.l - k.(l-1)} \qquad (9)$$

The sign of the derivative depends on the sign of (i– t). If the social cost of taxes is higher than the interest rate, as would usually be the case, the derivative will be negative.
Then an increase of the public leverage will lead to nationalization.

Influence of the social cost of taxes, t

Deriving R with respect to ***t*** gives:

$$\delta \mathbf{R} / \delta \boldsymbol{t} = \frac{-(g-1)}{i.l - k.(l-1)} \qquad (10)$$

The sign here is positive. An increase of the social cost of taxes leads to privatization.

To sum up, the expected signs on theoretical grounds are:

a) Negative for the private cost of capital, and
b) Positive for the social cost of taxes.

They could be either positive or negative for the interest rate, the private leverage and the public leverage, depending on the respective values of the exogenous variables in any given period.

There is thus ample scope in the model for alternative privatization and nationalization moves, according to the conjunction of variable values in historical context.

However, some signs depend on the precise values taken by some variables in the model in given period of time. To account for the possible inversion of signs of the interest rate, the private leverage and the public leverage we construct dummy variables summarizing the influence of diverse variables on these signs, in every relevant observation period.

For instance, for the sign of influence of the interest rate on privatization (or nationalization) we compute in each period the sign of the term: $(1- l).g.k - (1- g).l.t$

For the sign of the private leverage we compute the sign in each period of $(k – i)$.

And for the sign of the public leverage we compute in each period the sign of $(i – t)$.

Then we introduce an interaction term of these dummies with the relevant variable, the sign of which they are susceptible to revert in certain periods:

- INTER 1: Interest rate * dummy (0 if the expected influence is negative, 1 if the expected influence is positive).

- INTER 2: Public leverage * dummy (0 if the expected influence is negative, 1 if the expected influence is positive).

- INTER 3: Private leverage * dummy (0 if the expected influence is negative, 1 if the expected influence is positive).

We thus expect in theory a negative sign on the three variables themselves (interest rate, private leverage, public leverage) and a positive sign on the three interaction variables INTER 1, INTER 2 and INTER 3.

IV. Data and Test

We test our theory on data for eight OECD countries (Belgium, Denmark, France, Italy, the Netherlands, Spain, Sweden, and the United Kingdom) during the 1988-2002 period.

The endogenous variable is the amount of privatizations (in dollar terms) as a % of GDP. We chose this variable rather than the number of privatizations in order to take into account the weight of privatizations into the economy. Indeed, the number of privatizations does not reflect well privatization's activity of a country; this number depends directly on what is privatized. Using the number of privatization as the endogenous variable would have conducted to consider for example countries involved in the privatization of an important number of restaurants and hotels (as in Czech Republic or Algeria) as far more active than countries privatizing infrastructures and banks (as in France and the United Kingdom).

The source of our endogenous variable (the amount of privatizations) is the most complete database on privatization, "Privatization Barometer"[8] (FEEM), which computes data on privatizations in 25 European countries. It is the official data provider of the OECD and the World Bank.

The exogenous variables are measured by the following:

- The cost of shareholder's capital is approximated by 1/Price Earning Ratio.

- The social cost of taxes approximated by the square of the share of taxes in GDP (tax receipts as a % of GDP) ².

- The interest rate (3 month market rate, assumed identical for private and state borrowers).

[8] http://www.privatizationbarometer.net/

- The public finance leverage (as governments finance their activities with taxes and debt, the public leverage is approximated by the ratio Public Debt / (Public Debt + Taxes)).

- The financial leverage in private firms approximated by the aggregated private debt of traded companies divided by their aggregated assets.

- And the three interaction variables.

The more common explanations found in the literature rely on the superior economic efficiency of private ownership versus state ownership, on the one hand, and the ideological explanation on the other. Lopez-de-Silanes, Shleifer and Vishny (1997) for instance mix these two explanations into one by considering the role of the budgetary constraints of the counties in the US and the political resistance of unions and voters as factors explaining privatizations in the US. One can add some loose considerations about the increased intensity of competition in equity markets around the world due to the increased mobility of capital (a kind of availability of private funds explanation).

In order to test the validity and robustness of our model against such other theories we add:

- Two political variables used by Bortollotti (2006), the fractionalization of political power and the government's ideological orientation. Source of data: Fondazione Eni Enrico Mattei, FEEM Political Database 1975-2002, http://www.feem.it/fpd.

- Public sector employment as a measure of the size of the state and thus of the loss of information (Williamson).

- The development of financial markets measured by the stock market capitalization as a % of GDP.

Our dataset of 8 countries for 15 years is the most complete currently available for this test, since:

- For an important part of the 25 countries in the database "Privatization Barometer", no privatization has been recorded before 1992 or 1995. We made the choice of limiting the number of countries rather than the period of time.
- Available data from DataStream on aggregated private leverage since 1988 has also limited our choice of countries.
- Germany has been excluded from our dataset, because of the unclear impact of the reunification on endogenous variables of the model (i.e. public finance data and public employment)
- Greece has been excluded from our dataset, because of the lack of reliable data on public finance and public employment.
- Political variables of the "FEEM Political Database" were not gathered after 2002.
- Some public finance and private finance data for several countries are not available prior 1988.

Summary of variables		
Variable	**Measurement**	**Source of data**
Endogenous Variable	Amount of privatizations as a % of GDP	Privatization Barometer and OECD
Cost of shareholder's capital	1/Price Earning Ratio	Global Financial Database
Social cost of taxes	(Tax receipts as a % of GDP)²	OECD
Interest rate	3 month market rate	Global Financial Database
Public finance leverage	Public Debt / (Public Debt + Taxes)	OECD
Private finance leverage	Aggregated Debt / Aggregated Assets	DataStream
INTER 1	Interest rate * dummy (0 if the expected influence is negative, 1 if the expected influence is positive)	Global Financial Database
INTER 2	Public leverage * dummy (0 if the expected influence is negative, 1 if the expected influence is positive).	OECD
INTER 3	Private leverage * dummy (0 if the expected influence is negative, 1 if the expected influence is positive).	DataStream
Fractionalization of political power	See http://www.feem.it/fpd	FEEM Political Database 1975-2002
Government's ideological orientation	See http://www.feem.it/fpd	FEEM Political Database 1975-2002
Public sector employment	Number of public employees	OECD
Development of financial markets	Stock market capitalization as a % of GDP	Global Financial Database

The econometric method we use is the fixed effects model « FIXONE » in the SAS package. The following results present the results with the random effects model (« RANONE » of SAS) and then OLS results. The table of the correlation matrix and summary statistics follow.

In the tables of results the name of each exogenous variable is followed by the "expected result" in bracket, meaning the influence expected in theory, nationalization (negative sign) and privatization (positive sign).

Table 1. Fixed Effects Model										
Label	Estimate	*t Value*	Estimate	*t Value*	Estimate	*t Value*	Estimate	*t Value*	Estimate	*t Value*
Intercept	0.01673	*1.14*	0.018013	*1.23*	0.016049	*1.06*	0.015954	*0.85*	0.005174	*0.17*
Cost of equity (nationalization)	-0.05117	*-1.58*	**-0.07154 ****	*-2.08*	**-0.07415 ****	*-2.12*	**-0.07408 ****	*-2.06*	**-0.07512 ****	*-2.08*
Social cost of taxes (privatization)	0.017199	*0.39*	0.044362	*0.94*	0.049541	*1.03*	0.049648	*0.99*	0.047387	*0.94*
Interest rate (nationalization)	**-0.04706 ***	*-1.81*	**-0.05034 ****	*-1.95*	**-0.05194 ****	*-1.99*	**-0.05183 ***	*-1.77*	**-0.05083 ***	*-1.73*
INTER 1: Interest rate * dummy (privatization)	0.029105	*1.16*	0.039933	*1.55*	**0.042937 ***	*1.62*	0.04296	*1.61*	0.042054	*1.56*
Public Leverage (nationalization)	-0.00506	*-0.29*	0.005367	*0.29*	0.005038	*0.27*	0.005076	*0.26*	0.00726	*0.36*
INTER 2: Public Leverage * dummy (privatization)	-0.01005	*-1.52*	-0.00749	*-1.11*	-0.00648	*-0.92*	-0.00647	*-0.9*	-0.00534	*-0.69*
Private Leverage (nationalization)	**-0.03214 ***	*-1.82*	**-0.03772 ****	*-2.11*	**-0.03618 ****	*-1.99*	**-0.03613 ***	*-1.91*	**-0.03358 ***	*-1.69*
INTER 3: Private Leverage * dummy (privatization)	-0.00281	*-0.66*	-0.00353	*-0.83*	-0.00346	*-0.82*	-0.00346	*-0.81*	-0.00366	*-0.85*
Fractionalization of political power (nationalization)			**-0.00058 ***	*-1.63*	**-0.0006 ***	*-1.67*	**-0.0006 ***	*-1.66*	**-0.00064 ***	*-1.71*
Ideology					0.000239	*0.52*	0.000241	*0.49*	0.000131	*0.24*
Financial Market Development (privatization)							2.511E-07	*0.01*	1.89^{E}-06	*0.06*
Public Employment (privatization)									2.039^{E}-09	*0.44*
R-Square	0.1913		0.2116		0.2137		0.2137		0.2152	
F Value	1.89		2.23		2.23		2.21		1.58	
Estimation Method	FixOne									
Number of Cross Sections	8									
Time Series Length	15									
Dependent Variable:	Value of privatization transactions during the year / GDP									
Significance level: 10 percent (*), 5 percent (**), and 1 percent (***).										

Table 2. Random Effects Model										
Label		Estimate	*t Value*	Estimate	*t Value*	Estimate	*t Value*	Estimate	*t Value*	Estimate	*t Value*
Intercept		0.013881	*1.74*	0.016594	*1.66*	0.015325	*1.44*	0.018311	*1.32*	0.010627	*0.76*
Cost of equity (nationalization)		**-0.05749 ***	*-1.94*	**-0.05712 ***	*-1.89*	**-0.05782 ***	*-1.9*	**-0.06011 ***	*-1.9*	**-0.06487 ****	*-2.09*
Social cost of taxes (privatization)		0.007392	*0.36*	0.00776	*0.34*	0.00941	*0.4*	0.009285	*0.38*	0.018091	*0.76*
Interest rate (nationalization)		-0.03869	*-1.57*	**-0.04057 ***	*-1.64*	**-0.04182 ***	*-1.66*	**-0.04639 ***	*-1.64*	**-0.0494 ***	*-1.74*
INTER 1: Interest rate * dummy (privatization)		0.02958	*1.22*	0.027672	*1.13*	0.02931	*1.17*	0.029267	*1.16*	0.032062	*1.27*
Public Leverage (nationalization)		-0.00491	*-0.45*	-0.00531	*-0.44*	-0.00566	*-0.47*	-0.00665	*-0.52*	-0.0029	*-0.23*
INTER 2: Public Leverage * dummy (privatization)		-0.00503	*-0.87*	-0.00576	*-0.98*	-0.00518	*-0.85*	-0.00584	*-0.92*	-0.00218	*-0.33*
Private Leverage (nationalization)		-0.00776	*-0.71*	-0.01271	*-1.07*	-0.01178	*-0.96*	-0.01469	*-1.06*	-0.00821	*-0.62*
INTER 3: Private Leverage * dummy (privatization)		-0.00138	*-0.33*	-0.00171	*-0.41*	-0.00164	*-0.4*	-0.00172	*-0.41*	-0.0016	*-0.39*
Fractionalization of political power (nationalization)				-0.00007	*-0.59*	-0.00007	*-0.57*	-0.00008	*-0.62*	-0.00029	*-1.5*
Ideology						0.000161	*0.35*	0.000119	*0.25*	0.000073	*0.15*
Financial Market Development (privatization)								-8.22E-06	*-0.33*	-8.68E-06	*-0.36*
Public Employment (privatization)										1.53E-09	*1.43*
R-Square		0.0968		0.105		0.1061		0.1085		0.1201	
Hausman Test for Random Effects	DF	8		9		10		11		12	
	m Value	7.28		24.7		38.95		12.08		7.14	
	Pr > m	0.5065		0.0033		<.0001		0.358		0.848	

Significance level: 10 percent (*), 5 percent (**), and 1 percent (***).

Table 3. Ordinary Least Squares										
Label	Parameter Estimate	*t Value*	Parameter Estimate	*t Value*	Parameter Estimate	*t Value*	Parameter Estimate	*t Value*	Parameter Estimate	*t Value*
Intercept	0.0141	*2.41*	0.01652	*2.4*	0.01514	*1.89*	0.01457	*1.32*	0.01037	*0.94*
Cost of equity (nationalization)	**-0.0664 ****	*-2.34*	**-0.06536 ****	*-2.29*	**-0.06562 ****	*-2.29*	**-0.06535 ****	*-2.26*	**-0.06341 ****	*-2.22*
Social cost of taxes (privatization)	-0.0007043	*-0.04*	-0.00548	*-0.31*	-0.004	*-0.22*	-0.00397	*-0.22*	0.00677	*0.36*
Interest rate (nationalization)	-0.03487	*-1.43*	-0.03465	*-1.42*	-0.03603	*-1.45*	-0.03501	*-1.24*	**-0.04827 ****	*-1.69*
INTER 1: Interest rate * dummy (privatization)	0.03361	*1.4*	0.02905	*1.16*	0.03064	*1.2*	0.03055	*1.19*	0.03167	*1.25*
Public Leverage (nationalization)	-0.00815	*-0.92*	-0.00945	*-1.04*	-0.00962	*-1.05*	-0.00935	*-0.95*	-0.0072	*-0.74*
INTER 2: Public Leverage * dummy (privatization)	-0.00371	*-0.66*	-0.00403	*-0.71*	-0.00347	*-0.58*	-0.00334	*-0.54*	0.00059626	*0.09*
Private Leverage (nationalization)	0.00187	*0.21*	0.00132	*0.15*	0.00229	*0.24*	0.00271	*0.25*	0.0045	*0.41*
INTER 3: Private Leverage * dummy (privatization)	-0.00111	*-0.27*	-0.00128	*-0.31*	-0.00122	*-0.29*	-0.00119	*-0.28*	-0.00096131	*-0.23*
Fractionalization of political power (nationalization)			-5.1E-05	*-0.67*	-4.733E-05	*-0.61*	-4.614E-05	*-0.58*	**-0.00028804 ****	*-2.05*
Ideology					0.0001594	*0.34*	0.0001686	*0.35*	0.00009478	*0.2*
Financial Market Development (privatization)							1.57E-06	*0.08*	-0.00000528	*-0.26*
Public Employment (privatization)									**0.000000001518392 ****	*2.07*
Dependent Mean	0.00409		0.00409		0.00409		0.00409		0.00409	
Coeff Var	146.68471		147.0511		147.64602		148.324		146.11511	
R-Square	0.0886		0.0923		0.0932		0.0933		0.1282	
Adj R-Sq	0.0229		0.018		0.01		0.0009		0.0305	

Significance level: 10 percent (*), 5 percent (**), and 1 percent (***).

Appendix: Pearson Correlation Coefficients

Prob > |r| under H0: Rho=0

	Cost of equity	Social cost of taxes	Interest rate	Interest rate * dummy	Public Leverage	Public Leverage * dummy	Private Leverage	Private Leverage * dummy	Fractionalization of political power	Ideology	Financial Market Development	Public Employment
Cost of equity	1	-0.15749 0.0858	0.39432 <.0001	0.52329 <.0001	-0.13313 0.1472	0.24386 0.0073	-0.11081 0.2283	-0.18774 0.04	-0.06212 0.5003	-0.02328 0.8007	-0.20923 0.0218	-0.02131 0.8173
Social cost of taxes	-0.15749 0.0858	1	-0.15439 0.0922	-0.62305 <.0001	0.00584 0.9495	-0.35706 <.0001	0.54866 <.0001	0.26941 0.0029	-0.31072 0.0006	-0.24183 0.0078	-0.08846 0.3367	-0.44229 <.0001
Interest rate	0.39432 <.0001	-0.15439 0.0922	1	0.49398 <.0001	-0.17133 0.0613	0.32529 0.0003	-0.05593 0.544	-0.63478 <.0001	-0.04713 0.6092	0.08281 0.3686	-0.51295 <.0001	0.07134 0.4387
INTER 1: Interest rate * dummy	0.52329 <.0001	-0.62305 <.0001	0.49398 <.0001	1	0.15022 0.1015	0.41026 <.0001	-0.45655 <.0001	-0.35546 <.0001	-0.09078 0.3241	0.09431 0.3056	-0.13172 0.1516	0.05494 0.5512
Public Leverage	-0.13313 0.1472	0.00584 0.9495	-0.17133 0.0613	0.15022 0.1015	1	-0.25485 0.005	0.18158 0.0472	0.15469 0.0916	-0.32135 0.0003	0.01322 0.886	-0.19624 0.0317	-0.32892 0.0002
INTER 2: Public Leverage * dummy	0.24386 0.0073	-0.35706 <.0001	0.32529 0.0003	0.41026 <.0001	-0.25485 0.005	1	-0.24083 0.0081	-0.19331 0.0344	0.03391 0.7131	-0.15565 0.0896	-0.15833 0.0841	-0.01495 0.8713
Private Leverage	-0.11081 0.2283	0.54866 <.0001	-0.05593 0.544	-0.45655 <.0001	0.18158 0.0472	-0.24083 0.0081	1	0.22842 0.0121	-0.23109 0.0111	-0.31687 0.0004	-0.43859 <.0001	-0.37162 <.0001
INTER 3: Private Leverage * dummy	-0.18774 0.04	0.26941 0.0029	-0.63478 <.0001	-0.35546 <.0001	0.15469 0.0916	-0.19331 0.0344	0.22842 0.0121	1	-0.11302 0.2191	-0.17999 0.0492	0.20034 0.0282	-0.23148 0.011
Fractionalization of political power	-0.06212 0.5003	-0.31072 0.0006	-0.04713 0.6092	-0.09078 0.3241	-0.32135 0.0003	0.03391 0.7131	-0.23109 0.0111	-0.11302 0.2191	1	0.04173 0.6509	0.09061 0.325	0.86177 <.0001
Ideology	-0.02328 0.8007	-0.24183 0.0078	0.08281 0.3686	0.09431 0.3056	0.01322 0.886	-0.15565 0.0896	-0.31687 0.0004	-0.17999 0.0492	0.04173 0.6509	1	-0.01777 0.8472	0.17238 0.0597
Financial Market Development	-0.20923 0.0218	-0.08846 0.3367	-0.51295 <.0001	-0.13172 0.1516	-0.19624 0.0317	-0.15833 0.0841	-0.43859 <.0001	0.20034 0.0282	0.09061 0.325	-0.01777 0.8472	1	0.16729 0.0678
Public Employment	-0.02131 0.8173	-0.44229 <.0001	0.07134 0.4387	0.05494 0.5512	-0.32892 0.0002	-0.01495 0.8713	-0.37162 <.0001	-0.23148 0.011	0.86177 <.0001	0.17238 0.0597	0.16729 0.0678	1

Appendix : Summary Statistics						
Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Cost of equity	120	0.06135	0.02507	7.36232	0.00594	0.11494
Social cost of taxes	120	0.18475	0.05103	22.17018	0.09303	0.29052
Interest rate	120	0.07303	0.03642	8.76308	0.0278	0.157
INTER 1: Interest rate * dummy	120	0.04187	0.04636	5.02429	0	0.1512
Public Leverage	120	0.61769	0.07809	74.12289	0.46735	0.76069
INTER 2: Public Leverage * dummy	120	0.02653	0.1162	3.18343	0	0.54654
Private Leverage	120	0.34364	0.0826	41.23734	0.11628	0.50838
INTER 3: Private Leverage * dummy	120	0.15205	0.18109	18.2464	0	0.449
Fractionalization of political power	120	8.06957	8.72625	968.34822	0.42809	33.73911
Ideology	120	5.50159	1.35388	660.19067	3.91007	8.27391
Financial Market Development	120	64.80601	42.59436	7777	10.47605	200.74474
Public Employment	120	2461138	1814362	295336570	719088	5840943

V. Conclusions

We have presented an extended version of a positive theory of the fluctuating allocation of ownership rights between the State and private investors (Rosa, 1993). This theory is based on a similar interest of private investors and the State in the cash flow of firms, and does not necessarily assume inefficiency in the state owned firms, nor a sudden, unexplained reversal in ideological preferences. Both private investors and the State are rational but their respective cost of capital can and will diverge over time, changing the private/public valuation ratio. This theory can explain the privatization and the nationalization "waves", as well as differences in the allocation of ownership between countries.

Both the state and the private investors want to control firms in order to use their cash flows either for increasing the wealth of shareholders and managers, or for government consumption and transfers to politically influent clienteles.

In the bidding competition for ownership the investor who will prevail is the one (State or private) which values the firm most. Most analyses of privatization polarize the attention on differences in managerial efficiency between private owners and the state, or on the ideological factor. But whatever these differences may be, observed differences in the cost of funds for privately owned firms and SOEs necessarily determine differences in valuation of the same firm by private investors on the one hand, and the state as an investor, on the other. It follows that a few economic variables, taken together, explain the direction of ownership transfers: the cost of equity capital, interest rates, the social cost of taxes, and public and private leverages.

We have shown in the empirical part of the paper that the signs of influence of these relevant variables are those expected in theory, and are especially vindicated in our results for the cost of shareholder's capital, the interest rate, and the private leverage, confirming earlier results of the model (1993) with regard to the impact of interest rates.

The results however are mixed for the public leverage and the social cost of taxes, even though the signs are always right. It seems in a way that the private investors are the main agents of rationality in the competition for ownership since the variables that directly affect their behavior are the ones that effectively determine the observed changes of ownership of firms during the last few decades.

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