When to privatize? When to nationalize?
A competition for ownership approach

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December 2008

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 an optimal allocation of ownership should be, i.e. the desirable scope of government in production. They do not explain changes in state and private ownership boundaries, nor their timing. Accordingly, they can hardly account for the two "great reversals" that shaped the past century, the post-WWII nationalizations being followed since the 1980s by a privatization wave. While the privatization movement has dramatically slowed down[2] recently, even reverting again to nationalization in the wake of the current crisis[3], the fluctuating allocation of property rights over firms between private investors and the state still awaits for an explanation.

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 15 years of privatization in 8 countries lend support to our theory.

JEL Classification Number: H10, D20, G32

Keywords: Privatization, Nationalization, Cost of Funds, Competition for Ownership.

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2 'The first half of 2008 saw privatization proceeds for European Union fall to one of their lowest levels since […] the late 1980s.' (Privatization Barometer Interim Report 2008).

3 Government takeover of private firms around the world are nothing less than partial nationalizations. Recent full and partial nationalizations include the Royal Bank of Scotland, HBOS-Lloyds TSB, Northern Rock, American International Group, Bradford and Bingley, Fortis, ING Group, Fannie Mae, Freddie Mac…

I. INTRODUCTION

The literature on privatization is now extensive. The explanations for the phenomenon, however, are still at pain to explain why the privatization phenomenon occurred at about the same time in many countries, and why not before. In addition, existent theories can hardly account for the two great reversals that shaped the past century, in which privatization and nationalization phases alternated. While the post-WII nationalizations were followed by a privatization wave from the 1980s to 2007, the privatization movement has dramatically slowed down[4] since the beginning of 2008, and the trend has even reversed again with the beginning of the financial crisis in September 2008[5].

These difficulties arise 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.

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 (De Long and Shleifer, 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 (Langohr and Viallet, 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.

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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[6].

On the contrary, 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 post WWII and the current nationalization waves 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 and nationalization is weak since it assumes both irrationality on the part of deciders and an unexplained change of ideas from one period to another. For instance Megginson and Netter (2001) note that: 'twenty years ago proponents of state ownership could just as easily have surveyed the postwar rise of state-owned 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.

The efficiency hypothesis is more common but it runs also into some 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

6 As Shleifer (1998) describes the scope of benevolent government in "State versus Private Ownership".

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 the privatization phenomenon occurred at about the same time in many countries, and why not before. One cannot explain the privatization wave that started in the 80s in Europe 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. In addition, previous and recent governments' nationalization decisions around the world are in total contradiction with the efficiency hypothesis.

II. THE COMPETITIVE BIDDING MODEL

We suggest that the mystery of privatization/nationalization 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.

To make things 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 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 λΠ (< Π) for the state-owned firm.

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 the firm most. The value of the firm, V, being the ratio Π / k, where k is the cost of funds, differences in valuation depend on the differences in the cost of funds.

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 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[7]. 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[8]. 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.

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 (1993) 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 ideological factors.

It is a theory of the competition for ownership along the same classical lines as competition for ownership among private investors. Privatization (nationalization) being the purchase – at a price – of SOEs (private firms) by private investors (state investor) should be considered a rational outcome of current economic conditions.

7 The concept of a "weighted average cost of State's fund", similar to the corporate WACC is first used in Rosa (1988).

8 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.

III. EQUILIBRIUM OWNERSHIP ALLOCATION

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).

∏ : 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:

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

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

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

Vp = ∏ / [(1- *l*).*k* + *l*.*i*] (3)

Vg = ∏ / [(1- *g*).*t* + *g*.*i*] (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.

IV. THE DETERMINING INFLUENCES

1. Influence of the cost of shareholder's capital, k

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

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

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

2. Influence of the interest rate, i

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

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

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*.

3. 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, 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.

4. 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.

5. 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.

V. DATA AND TEST

We test our theory on data for eight countries (Belgium, Denmark, France, Italy, the Netherlands, Spain, Sweden, and the United Kingdom) during the 1988-2002 period. The choice of these countries and the period is based on data availability. Time series on privatizations and different components of the cost of funds are not available for other countries and longer time period.

The endogenous variable is the amount of privatizations 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"[9] (FEEM), which computes data on privatizations in 25 European countries. It is the official data provider of the OECD.

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).
- 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.

In order to test the validity and robustness of our model against such other theories we add two political variables used by Bortollotti (2006) (Source of data: Fondazione Eni Enrico Mattei, FEEM Political Database 1975-2002[10]):

- The fractionalization of political power
- And the government's ideological orientation.

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

9 http://www.privatizationbarometer.net/

10 http://www.feem.it/fpd

- For an important part of the 25 countries in the database "Privatization Barometer", no data was 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)
- Greece has been excluded from our dataset, because of the lack of reliable data on public finance.
- 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

As is customary in panel data analysis (see Baltagi (1995)), we estimate both a fixed effects and a random effects model. The econometric methods we use are the fixed effects model « FIXONE » and the random effects model « RANONE » in the SAS package. The following table presents results with the random effects model and the fixed effects model (Table 1). The table of the correlation matrix (Table 2) and summary statistics (Table 3) 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. Random and Fixed Effects Model									
		Random Effects Model				Fixed Effects Model			
		(1)		(2)		(1)		(2)	
Label		Estimate	*t Value*	Estimate	*t Value*	Estimate	*t Value*	Estimate	*t Value*
Intercept		0.016594	*1.66*	0.015325	*1.44*	0.018013	*1.23*	0.016049	*1.06*
Cost of equity (nationalization)		-0.05712 *	*-1.89*	-0.05782 *	*-1.9*	-0.07154 **	*-2.08*	-0.07415 **	*-2.12*
Social cost of taxes (privatization)		0.00776	*0.34*	0.00941	*0.4*	0.044362	*0.94*	0.049541	*1.03*
Interest rate (nationalization)		-0.04057 *	*-1.64*	-0.04182 *	*-1.66*	-0.05034 **	*-1.95*	-0.05194 **	*-1.99*
INTER 1: Interest rate * dummy (privatization)		0.027672	*1.13*	0.02931	*1.17*	0.039933	*1.55*	0.042937 *	*1.62*
Public Leverage (nationalization)		-0.00531	*-0.44*	-0.00566	*-0.47*	0.005367	*0.29*	0.005038	*0.27*
INTER 2: Public Leverage * dummy (privatization)		-0.00576	*-0.98*	-0.00518	*-0.85*	-0.00749	*-1.11*	-0.00648	*-0.92*
Private Leverage (nationalization)		-0.01271	*-1.07*	-0.01178	*-0.96*	-0.03772 **	*-2.11*	-0.03618 **	*-1.99*
INTER 3: Private Leverage * dummy (privatization)		-0.00171	*-0.41*	-0.00164	*-0.4*	-0.00353	*-0.83*	-0.00346	*-0.82*
Fractionalization of political power (nationalization)		-0.00007	*-0.59*	-0.00007	*-0.57*	-0.00058 *	*-1.63*	-0.0006 *	*-1.67*
Ideology				0.000161	*0.35*			0.000239	*0.52*
R-Square		0.105		0.1061		0.2116		0.2137	
F Value						2.23		2.23	
Hausman Test	DF	9		10					
	m Value	24.7		38.95					
	Pr > m	0.0033		<.0001					

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

For the two tests (1) and (2), the fixed effects model (Table 1) is more appropriate than the random effects model, since the Hausman test is significant.

The coefficient on the variable for the cost of equity is always negative and significant at 5% for all measures. As expected on theoretical grounds, a decrease of the cost of shareholder's capital leads to a privatization movement.

The coefficient on the variable for the interest rate is also always negative and significant at 5%. The interaction variable INTER 1 is always positive as expected but is only significant in the second test (2). As we were expecting, when the cost of equity, social cost of taxes and the public and private leverages are configured as follow (1- g).l.t > (1- l).g.k, a decrease of the interest rate leads to a privatization movement.

The coefficient on the variable for the private leverage is always negative and significant at 5%. However the interaction variable INTER 2 is not significant. As expected, when the interest rate is higher than the cost of capital, a decrease of the private leverage leads to a privatization movement.

The coefficient on the variable for the social cost of taxes is not significant, even if the sign is always positive as expected on theoretical grounds. The coefficient on the variable for the public leverage is also not significant.

The coefficient on the variable for the fractionalization of political power is significant at 10% (fixed effect tests (1) and (2)). However, as we were expecting, ideology is not significant.

Table 2: 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
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
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
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
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
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
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
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
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
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
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

Table 3: 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

VI. CONCLUSIONS

We have presented a positive theory of the fluctuating allocation of ownership rights between the State and private investors. 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.

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.

Last but not least, our theory can explain the current renationalization policy since stock market crashes around the world have much increased the private investors' cost of funds, while the states' cost of funds (the deadweight loss of taxation and interest rates) has not moved much. The relative valuation ratio has thus changed substantially in a direction that favors state over private ownership.

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