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Abstract

We study the effect of state ownership on the market-to-book ratios of publicly traded European utilities observed from 1994 to 2005. We find that when the company is subject to independent regulation, state ownership is positively associated with firm value. This effect is strong and significant in countries where weak checks and balances and political fragmentation do not constrain the power of the executive. We conclude that where political institutions are weak, politicians imperfectly delegate powers to regulatory agencies in order to benefit state-owned firms.

JEL Classification: K23, L33, L51, L90, G32

Keywords: Privatization; Regulatory Independence; Political Institutions; Firm Value

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<div align="right">"How can the state regulate the firms it also runs?"</div>

<div align="right">*The Economist* (2012, p. 17)</div>

1. Introduction

Three decades after the start of the largest transfer of ownership in the history of the corporation privatization is fading away. Since the turn of the century, state assets divestiture has been slowing down in most developed economies and advancing somehow in emerging countries due to the initial floatation of large State-owned Enterprises (SOEs). However, around the world the most common outcome of this process is government control of (partly) privatized firms, a qualifying feature of the so-called "rise of state capitalism".[1] Interestingly, and contrary to conventional wisdom, residual control rights by the government do not affect negatively the value of the firm. Recent evidence has shown that partial privatization improves financial and operating performance (Gupta, 2005) and that firms under government control tend to be more valuable than fully privatized firms (Beltratti *et al.*, 2007; Bortolotti and Faccio, 2009).

Public utilities, i.e. firms operating in network industries, such as energy, telecommunication, transports, and water, had a great bearing in past privatization processes. In most developed countries, sales advanced in parallel with deep structural reforms promoting liberalization and regulation of former state monopolies to boost efficiency and private investment.[2] In the European Union, for example, the Commission urged the member states to establish Independent Regulatory Authorities (IRAs), i.e. autonomous public organizations to which governments delegate the regulatory policy. Yet, government control of privatized/regulated firms is commonly observed also in public utilities.[3] Interestingly, we observe a similar effect of residual state ownership on firm value: higher state ownership is associated to higher firm value, but this happens only when the firm becomes subject to an IRA. Figure 1 illustrates the evolution of market-to-book ratios of European telecom and energy utilities before and after the official establishment of respective IRAs. We notice that, in the three-year period after the event, state-controlled firms outperform privately controlled firms by 15 percent on average.

Aim of this paper is twofold: first, we evaluate empirically the effect of government ownership on the market value of public utilities, controlling for other possible determinants. Second, should this relation exist, we try to establish the channel linking government ownership to

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[1] According to a recent report on state capitalism, the combined market value of global SOEs is more than $2 trillion and total employment around 6 million (*The Economist*, January 21st, 2012).

[2] Utilities accounted for two thirds of the privatization revenues raised in European countries from 1977 to date (Privatization Barometer, 2010).

[3] In the European Union, 85 per cent of privatized utilities are under government control (Roland, 2008).

the valuation of companies subject to independent regulation. To this purpose, we use an original panel dataset of 88 publicly traded network utilities from 14 EU countries observed from 1994 to 2005, which includes 10 of the top 30 companies in terms of market capitalization within the European Industrial Sector (Mediobanca Investment Bank, 2009). Estimates rely on both cross-country and within-country variation in the data around regulatory reforms and political institutions.

Why should governments own firms? Conventional wisdom and a bulk of theoretical literature suggest that politicians are "bad owners" of corporations as they typically impose objectives that destroy shareholders' value (Shapiro and Willig, 1990; Shleifer and Vishny, 1994; Bennedsen, 2000).[4] At the same time, politicians are also viewed as "bad regulators" as their interference may lead to time-inconsistent regulatory decisions and to the expropriation of utilities' sunk investments (Stigler, 1971). These arguments provide the rationale for the privatization of SOEs, insofar as the transfer of ownership rights to the private sector improves incentives and boosts operating performance (Megginson and Netter, 2001), and for the setting up of IRAs, in order to foster the credibility of regulatory commitments (Levy and Spiller, 1994; Baldwin and Cave, 1999).

However, the existence of a legally (*de jure*) independent regulator is not sufficient to ensure real (*de facto*) independent decisions, because genuine independence hinges, among other things, upon the real powers that the political system delegates to the agency, in other words upon the residual rights to intervene in regulatory decisions retained by incumbent politicians.[5] We label *reluctant regulation* the institutional setting when regulatory powers are delegated to a formally independent regulator, but subject *de facto* to political interference.

Reluctant regulation matters when the government retains significant ownership rights in regulated firms. In this case, politicians may wield their powers to obtain favourable regulatory decisions that boost the utilities' profitability, and this in turn allows the government, for example, to raise additional fiscal revenues via extra-dividends and to avoid tax increases, spending cuts or other politically costly decisions or to promote "national champions". The expectation that the government gives a "helping hand" indirectly via regulation boosts the market value of utilities under mixed (private-public) ownership, with private shareholders sharing the financial rent provided for by the public shareholder.

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[4] In this perspective, privatization can be seen as a safeguard against the opportunistic behavior of politicians (Sappington and Stiglitz, 1987). See also the recent survey by Martimort (2006).

[5] Alesina and Tabellini (2008), studying the normative criteria that allocate tasks between politicians and bureaucrats, point out that regulation of public utilities is an example of "policies that lend themselves to bureaucratic delegation, since they pit special interests against those of consumers as a whole". However, such a delegation comes to a cost in terms of the loss of political control over the industry leading to *imperfect* delegation of power. In fact, "institutions are more likely to be designed so as to deliver maximal rents at the lowest risk for the incumbent politician" (page 444-445).

To establish the link between residual state ownership and regulated firms' market value, we focus on reluctant regulation as possible channel by exploiting the heterogeneity in the ownership patterns and in the regulatory settings. The seminal study by Levy and Spiller (1994) shows that political interference in regulatory decisions is more likely when the institutional constraints on executive discretion are weak. In this case, regulatory commitment is less credible since political powers can more easily overturn administrative decisions. Formal institutional arrangements that constrain executive discretion typically include the explicit separation of powers, an effective "checks and balance" system between the different branches of the government, and an electoral system that enhances party proliferation and political fragmentation. We thus expect reluctant regulation to surface where institutional constraints are weak providing governments' incentives to retain higher stakes in regulated firms. Where instead one country's institutional endowment fosters genuine independent regulation, residual public ownership should be completely neutral with respect to firm value.

Our empirical results are consistent with our predictions. We find that residual state ownership positively affects the market value of regulated firms and that this effect is significant only where political institutions do not effectively restrain governments' power. Importantly, in a model where we take fully into account the endogeneity of residual state ownership and independent regulation, we show that political institutions affect firm value only indirectly, and that residual stakes by the government are the only channel through which institutions affect the valuation of regulated firms. Results survive when we account for sectors characteristics, country specificity, thresholds of ownership and control rights, and for the extent of market liberalization, supporting the view that reluctant regulation is a fundamental driver of the performance of public utilities.

Several papers have addressed related issues. For example, some empirical studies have shown that political institutions are significant determinants of structural reforms such as regulatory decisions (Duso, 2005; Guerriero, 2011), market liberalization (Pitlik, 2007; Potrafke, 2010; Duso and Seldeslachts, 2010) and privatisation (Li and Xu, 2002; Bortolotti and Faccio, 2009; Dinc and Gupta, 2011).[6] In a similar vein, Edwards and Waverman (2006) have addressed the link between government ownership and regulatory independence. Using a sample of 15 EU incumbent telecommunications operators tracked from 1997 to 2003, the authors show that public ownership of the incumbent positively affects wholesale rates, suggesting that governments influence regulatory outcomes in favour of incumbents where they have substantially invested in. However,

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[6] In a different, but related field, Albalate *et al.* (2012) study the political institution determinants of the provision of public goods, with an application to military spending.

this effect is mitigated in presence of institutional features enhancing regulatory independence from the government.

To the best of our knowledge, our paper is the first systematic analysis on the impact of state ownership on regulated firms' market value in the EU introducing political institution and the novel concept of reluctant regulation as explanatory factor of this empirical relation.

The rest of the paper is organized as follows. In Section 2 we describe the institutional context. In Section 3 we present our research design and the estimation strategy. In Section 4, we describe our data, specifically the sample, the firm level data and the regulatory, ownership and political variables. In Section 5 we present the empirical results from estimating the market value regression, while in Section 6 we account for the effect of different political institutions. In Section 7 we present some robustness checks. Section 8 concludes.

2. The Institutional Reforms in the Utility Sectors in the European Union

Following a big wave of nationalization after the Second World War, vertically integrated, stated-owned, monopolies largely dominated European network industries. Under this regime, utilities were an operational branch of the government and instructed to provide universal services at low prices, absorb unemployment, and invest in infrastructure. The government in turn played the dual role of owner and "regulator," and set tariffs, quality standards, and investment levels. This arrangement however created ill-performing and highly inefficient public monopolies (Megginson and Netter, 2001).

Starting from the mid 1980's in the UK, and early 1990's in the rest of Europe, the European Commission promoted a gradual liberalization and regulatory process intended to improve the efficiency and service quality of EU public utilities and increase their investments. In particular, the European Commission enacted a number of directives aimed at setting up a common regulatory framework for EU member states, which were in turn required to transpose these directives into national legislation.

One of the most important of these EU-driven reforms is perhaps the institution of IRAs, charged with the duty to regulate the activity of network industries and to discipline the potential conflict of interest between the government and state-controlled utilities. Typically, delegated regulatory tasks involve price-setting decisions both at retail and wholesale level - whenever access to essential facility is needed to develop market competition -, the definition of entry conditions, the imposition of quality standards and all the technical rules to use or access to existing infrastructures.

The IRAs ought to operate with their own specialized staff and detailed mandate, independently of ministries or government departments. The European Commission especially

urged member states' governments to establish national independent regulators at least in economy-wide sectors like energy and telecommunications, sometimes under the threat of infringement procedures before the European Court of Justice.[7] Nevertheless, the European Commission left the decision about the definition and the scope of the delegated powers entirely in the hands of national governments. This process of delegation led to the creation of formally independent (*de jure*) agencies. However, *de facto* independence clearly hinged upon how this delegation process was implemented in each member state. Indeed, agencies usually are not fully independent because political executives often retain ultimate responsibility for their activities (Verhoest *et al.*, 2012).

As for privatization, the European Commission left the decision about the ownership of regulated energy utilities entirely in the hands of national governments (see Bortolotti *et al.*, 2003). As a result, after more than a decade, many large EU utilities are still controlled by central and local governments, especially as far as France, Germany, and Italy, and the energy sector, are concerned.

The implementation of these institutional reforms (modern regulation, privatization, market liberalization) varies considerably across EU countries and sectors. Table 1 reports the year in which an IRA was established, the timing of transposition of sectoral directives in each Member State, and the allocation of proceeds from privatization over time. The data refer only to energy and telecoms because in water supply and transport infrastructure a common regulatory framework is still under construction, IRAs still do not exist (so regulation is carried out by government committees or within ministries) and privatization process are lagging behind. As shown in Table 1, in most member states, privatizations in energy and telecoms followed the implementation of EC directives on the adoption of regulatory framework and the inception of IRAs.

Reforms are most advanced in the telecom industry, where liberalization started in 1987 with the publication of the Green Paper for the Development of the Common Market for telecommunication services and equipment. The Green Paper was followed by a sequence of directives, starting from Directive 90/388 on "Competition in the markets for telecommunications services," which established the institution of national IRAs in each Member State. Table 1 shows that independent regulatory agencies now operate in virtually all member states: in the U.K. the IRA was established in 1984, while in the other EU countries IRAs were set up in mid nineties. As for firm ownership, at the onset of the liberalization process, the European Commission raised concerns about residual state ownership in telecoms companies.[8] As of 2005, most telecom

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[7] Recently, the European Commission launched an infringement procedure against Luxemburg, Romania and Slovakia regarding the telecoms authority's independence and its internal organization. See European Commission (2010; p. 44).
[8] "In some Member States, concerns are reported that *the structures in place do not ensure that regulatory decisions are not influenced by State ownership considerations*. In these cases, the necessary separation of the control of the incumbent and the regulatory powers should be re-examined (Belgium, Finland, Luxembourg, Ireland, France)" (European Commission, 1999, pag. 15).

companies were (at least partially) privatized and governments held majority of control only in the German and Swedish incumbents.

Market liberalization reforms are well ahead also in the energy sector, where the majority of electric and gas utilities are subject to regulation by an IRAs. The milestone legislation is Directive 96/92 for the electricity, followed by Directive 98/30 for the gas market; these directives aimed at gradually introducing competition in generation and retail segments, as well as at unbundling the various segments of the energy value chain. Importantly, these directives established independent national regulatory agencies: the U.K. was again the first country in Europe to establish an IRA in 1989, the other countries followed from 1995 to 2000, while Germany was the last one to set up an IRA for energy utilities in 2006. As regards firm ownership, the only fully privatized energy utilities are British. At the opposite side stands the French government, which, with its larger than 80% stake in both Gaz de France and Electricitè de France (and the 32% stake in Telecom France), appears as the most reluctant to release control in regulated utilities.

Finally, in water supply and in transportation infrastructure (docks and ports, airports and freight motorways) structural reforms still lag behind. With the exception of the U.K., most water and transportation utilities are still controlled by central and local governments and subject to regulation by ministries or other branches of the government rather than by independent regulatory agencies.

3. Research Design

3.1 Theoretical Framework

Our initial question is: how does ownership affect firm value when an IRA is in place?

When there is not an IRA in place, self-interested politicians may exploit state-controlled utilities to extract rents from social investment and employment programs that result in low profitability and inefficiency (see for example Megginson and Netter, 2001). In this case, private investors will typically shun regulated firms.

The establishment of IRAs – such as the process promoted by the European Commission during the 90s- functionally separates the (dual) role of the state as typical large shareholder of utilities and as regulator of the industry. The delegation act, formally shifting the regulatory powers from the political sphere to an independent bureaucratic entity, curbs *ex ante* political interference and opportunistic behavior by self-interested politicians (Levy and Spiller, 1984; Armstrong and Sappington, 2007). The enhanced credibility of regulatory commitments will attract private

investment, allowing the opening up of capital to external investors and - should commitments be sustained over time - full privatization (Perotti, 1995).

In theory, if regulators were *de facto* independent, IRAs should be able to thwart any attempt to "capture" by politicians, regardless of the private or public status of the firm (Laffont and Tirole, 1986, Sappington and Stiglitz, 1987). However, if regulators are *de iure* but not *de facto* independent, politicians wield regulatory powers and have incentives to retain a stake in the firm (Laffont and Tirole, 1991; Laffont, 1996). Indeed, by keeping regulators on their toes, politicians may obtain a favorable regulatory treatment of the state-owned utility, such as a soft regulatory stance (higher tariffs, higher entry barriers, etc.) in order to increase the firm's profits that will accrue, via dividends, to the public budget. Private investors of the regulated firm will share the benefits with the government and thus be willing to value positively its presence as shareholder in firms. This "corporatist" equilibrium is likely to exist when regulatory powers are imperfectly delegated to the formally, and not genuinely IRAs, i.e. in the regime that we refer to as *reluctant regulation*.[9]

Following this argument, the relevant research question becomes: under what conditions does state ownership have a positive impact on firm value? Our working hypothesis is that this will occur where reluctant regulation is more likely, i.e. where the institutional constraints on administrative discretion are weaker. To test this hypothesis, we exploit features of the political system that proxy the extent to which the executive's powers are constrained by formal institutional arrangements, and we predict that in those countries where such constraints are in place, regulators will be less subject to political interference and state ownership will not matter for valuation.[10]

The recent political economy literature has developed a vast array of variables capturing formal institutional arrangements that curb executive discretion or make policy reversal less likely (see, among others, Acemoglu, 2005; Persson and Tabellini; 1999; Persson, 2002). As highlighted by Levy and Spiller (1994), the credibility of regulation and the risk of political interference depend on the structure and organization of political institutions, such as an effective "checks and balances" system. Another important institutional feature is an electoral system, which leads to party proliferation and political fragmentation: proportional electoral systems make policy changes less

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[9] Under imperfect delegation of powers to the IRA, the politician may also extract the rent from the regulated firm through bribes. In this case, the politician would not have incentives to retain stakes in the firm. We would thus expect to see full privatization *cum* reluctant regulation where corruption is more widespread (Shleifer and Vishny, 1994). However, this alternative equilibrium is less likely to occur in developed economies such as the European countries for which this theoretical framework is designed.

[10] Alternative explanations could be set forth to explain why the firm value should be higher at state-controlled firms, such as that they are for some reason more efficient, more R&D oriented, better managed than privately-controlled firms. But, then, political institutions should not matter at all.

likely, thus enhancing the credibility of regulatory commitments; in contrast, majoritarian systems, characterized by the turnover of strong governments of different stripes, expose regulation to the risk of unexpected policy changes.

3.2 Empirical Modeling

The central empirical relationship we are interested in is of the following form:

$$Y_t = f \, (Government \; UCR_{t-1}, \; IRA_{t-1}, \; X_{t-1}),$$

where Y_t is firm value (the firm market-to-book ratio) at time t, $Government UCR_{t-1}$ is firm ownership (the residual ultimate control rights held by the government) at time t-1, IRA_{t-1} is a dummy denoting the presence of an independent regulatory agency (as opposed to executive-branch regulators or ministries) at time t-1 and X_{t-1} is a vector of control variables.

When exploring this relationship empirically, we face a number of issues. First, government's residual ownership is likely to be endogenous because pay-out expectations and investment opportunities affect the privatization decision. Second, endogeneity problems affect also the IRA dummy, since the government may have an incentive to set up the IRA in sectors where profitability is expected to be higher. Moreover, the IRA dummy is an imperfect measure of regulatory independence because it just denotes the presence of a regulatory authority. Third, as long as reluctant regulation matters only when the government retains significant ownership rights in regulated firms, we must consider the interaction between the ownership variable and the IRA dummy, treating the resulting term also as potentially endogenous. Identification is thus a serious issue that we will be discussed below.

Our empirical strategy is the following: to estimate the impact of residual state ownership on regulated firms' market value we first run OLS regressions where we enter the ownership variable both linearly and interactively with the IRA dummy. Second, we investigate whether the estimated coefficients of our variable of interest – the interaction between state ownership and IRA - differ in sub-samples characterized by institutional arrangements with lower or higher ability to constrain executive discretion. Third, we try to establish the channel linking regulated firms' value to residual ownership by running a test of over-identifiying restrictions that we describe below.

3.3 Identification and Instrumental Variables

Under a regime of reluctant regulation, government's power to interfere with regulatory policy will produce economic rents that will boost the market value of partially privatized firms. The credibility of regulatory commitment hinges therefore upon the ability of the political system to constrain administrative discretion.

Our identification strategy rests on the assumption that political institutions affect the latitude of government's residual regulatory powers and the size of the stake retained in public utilities. This qualifies political institutions as potentially valid instruments and, because a set of different variables is available, we estimate an over-identified model. By testing that our instruments do not have a direct impact on firm value beyond the effect they exert on the endogenous variables (see, for example, Persson, Roland and Tabellini, 2007; and Tabellini 2010), we can isolate the channel through which political institutions affect market value.

To find suitable instruments, we rely on political economy variables identified by the literature on the credibility of regulatory commitments. For example, the number of decision makers whose agreement is necessary before policies can be changed is a key feature of any political system. Therefore, our first political economy variable, and instrument, is *Checks & Balances*, a time-varying measure of the number of veto players in a political system, adjusting for whether these veto players are independent of each other. The index also records whether the same or different parties control the executive branch and the legislature in presidential systems, or whether there is a minority government or a coalition of one, or more parties controlling the government, in proportional systems (Beck et al. 2001, pp. 169-170). It ranges from 0 to 7 to measure low vs. high degree and quality of the checks and balances and is sourced from the World Bank DPI-Database on Political Institutions.[11]

The second political variable, complementary to checks and balances, accounts for the type of electoral system, whether it leads to party proliferation or aggregation within the Parliamentary system. We use the Electoral Disproportionality index, developed by Gallagher (1991) and updated by Bortolotti and Pinotti (2008) according to the following formula:

$$G = \sum_{i=1}^{N} \sqrt{\frac{1}{2}(v_i - s_i)^2}$$

where v_i is the share of votes obtained by party in general elections, s_i is the seat share of the party i, and N is the total number of parties in the legislature. The index is continuous and time varying; it

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[11] This measure has been widely used in the literature (see, for example, Keefer and Knack, 2007).

equals zero when there is perfect proportionality between seats and votes and it increases, on average, as the electoral rule moves towards the majoritarian system. By locating country-years in a political spectrum ranging from the majoritarian and the so-called "consensus" model of democracy, the index is a measure of political fragmentation. A lower electoral disproportionality is usually associated with a higher effective number of parties in legislature and government and more stable executives (Lijphart, 1999).

The instrument set then includes country-specific variables that help explaining the pace of privatization and liberalization reforms. The *Political Orientation Index* measures government's political preferences in the right-left political spectrum. As shown by Bortolotti and Faccio (2009), Potrafke (2010) and Duso and Seldeslachts (2010), the political orientation of the executive in charge is a significant determinant of structural reforms such as market liberalization and firm privatization. The index we use ranges from 0 (extreme left wing) to 10 (extreme right wing) and is the weighted average of the right-left political orientation scores of the parties forming the executive branch of government, where the weights are equal to the number of parliamentary seats held by each party divided by the total number of parliamentary seats held by the ruling coalition as a whole (see Huber and Inglehart, 1995, updated by Bortolotti and Pinotti, 2008). The *Debt to GDP* ratio is the ratio of total government debt (domestic and foreign) to GDP in a given year (our source here is the OECD Structural Analysis Database). Bortolotti and Faccio (2009) include this ratio to control for one country's fiscal conditions, as large debt to GDP ratios spurred the privatization wave in many EU member states struggling to comply with the requirements of the Maastricht Treaty. Finally, to account for changes in the market structure within public utility sectors, we use the *OECD Index of Liberalization*, sourced from the OECD International Regulation database by Conway and Nicoletti (2006). The index is an average of several indicators varying from 0 to 6 (larger numbers indicate a lower degree of openness) and accounts for entry barriers, vertical integration and other features of the industry structure. Because the original index also includes a sub-indicator for state ownership of the relevant firms, we excluded this component and recomputed the average over the remaining OECD sub-indicators.

4. The Sample and the Data

For the empirical analysis we use an unbalanced panel of 88 publicly traded utilities and transportation infrastructure operators from EU 15 member states, tracked from 1994 to 2005. All firms operate in regulated sectors, i.e. where entry and prices are subject to regulatory oversight either by the State through ministries, governmental committees, or local governments or by a

formally Independent Regulatory Agency (IRA), and many, though publicly traded on a stock exchange, are partially owned by the government. The regulated sectors include electric and natural gas utilities (in both distribution and transmission), water supply companies, fixed telecoms, freight roads concessionaires, and transport infrastructure operators such as ports, airports authorities, and rail infrastructure.

The data comprise a diversified set of firms operating in a wide array of industries that either were always under an IRA (such as UK energy, telecom and water companies), or never were subject to an IRA (freight roads concessionaries, ports and docks, airports and water companies in all Europe except UK), or that become regulated by an IRA within the sample period. Although in the empirical analysis we control for this heterogeneity by including firm fixed effects, one might worry that the different institutional and regulatory environment faced by the firms (Independent Authority, national ministries, local governments or some executive branch commission) might somehow bias our results. To address this concern, we conduct the econometric analysis both on the larger, more heterogeneous sample and on the sub-sample of energy (electricity and gas) utilities and telecom companies EU telecoms and energy (electricity and gas) utilities eventually subject to IRA and to similar EU-prompted market reforms. This sub-sample comprises 57 firms - 15 fixed telecom operators and 42 energy companies.

To measure regulatory independence, we use a dummy that is equal to 1 in all years in which the firm was subject to an IRA and equals 0 otherwise (i.e. when it is regulated by an executive-branch commission). The IRA dummy was constructed using data and information on IRAs' inception dates taken from Gilardi (2005) for energy and telecommunications. As shown in Table 1, the U.K. introduced an IRA in 1984 in the telecom industry and in 1989 in the energy sector, while most countries established an IRA only in mid nineties, most of them in the time span between 1995 and 2000. We complemented this data by drawing information about the presence of IRAs in the other sectors from additional sources and found that only the water industry in the UK has an independent regulatory agency. Overall, 60 firms (the 57 energy and telecom operators plus three UK water supply companies) are (or become) subject to an IRA while 28 are regulated by a governmental committee or a ministry.

For all firms, we identify and track overtime the state's ultimate control rights (*Government UCR*) following to the weakest link approach. According to this approach, the UCR of the state is simply equal to the minimum ownership stake along a chain (i.e., the weakest link). In the case of multiple chains, the UCR's are summed up across all chains.[12] Among the 88 firms, 42 firms are

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[12] The "weakest link" is widely used in the literature to measure control rights. See La Porta, Lopez-de-Silanes, and Shleifer (1999), Claessens, Djankov, and Lang (2000), Faccio and Lang (2002), and Bortolotti and Faccio (2009).

privately-controlled throughout our sample period, 26 are state-controlled throughout our sample period, and 20 were "privatized" during our sample period (i.e. when the state's ultimate control rights fall below 30% during our sample period). As Figure 2 shows, privatized utilities often display complex ownership structures, with pyramiding often used to separate share ownership and control. A first examination of our data reveals that the State has a stake in sixty-two companies and that thirty-seven of the partially State-controlled utilities are subject to an IRA. In Table 2, we report, for the ten largest utilities in the telecom and energy sectors, the year since when they operate under an IRA, the date of the IPO, the total market capitalization and the *Government UCR* at the end of the sample period (2005). Compared to telecommunications, energy IRAs were introduced later, mostly around 2000. The privatization process also differs across countries: it lags behind in France and Germany, but is more advanced in Spain and in the U.K. where most sample firms are under private control during the sample period. More in detail, we note that 4 out of 14 fixed telecom operators were fully privatized by 2005 whereas two, in Germany and Sweden, were still controlled by the State with a stake larger than 50%. Among energy operators, the UK companies are fully privatized, E.ON (Germany) and Iberdola (Spain) have government UCR below 5%, while the two France operators are still owned by the state with a share larger than 80% (as of 2005).

Accounting and financial firm-level data have been collected from *Worldscope*. As a measure of firm value, we use the market-to-book ratio (*MTB*). *MTB* is calculated as total assets minus the book value of equity plus the market value of equity divided by the total assets. The market value of equity is computed by multiplying the number of outstanding shares at the end of the relevant year by the share price at that date converted into U.S. dollars. Other key variables for the analysis of market-to-book ratios are the log of real total assets to control for size, the ratio of EBIT (earnings before interests and taxes) to total assets, which is a proxy for profitability and "efficiency", and firm financial leverage, defined as total financial debt divided by the sum of book equity and total financial debt.

We also control for key features of the financial and macroeconomic environment of the different EU countries. We use the *Investor Protection* index, i.e. the "anti-director rights" index developed by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999) and updated by Pagano and Volpin (2005) to proxy for the extent of protection and enforcement of investor rights. The index is time varying and goes from 0 to 7 as shareholders' rights become more protected. We expect that higher values of this index are associated with lower cost of equity and hence higher market value (see, for example, La Porta, Lopez-de-Silanes, Shleifer and Vishny, 2002). Finally, we include *GDP Growth* to account for country specific differences in macroeconomic conditions over time. Table 3

summarizes the descriptive statistics for the main firm and country level variables used in the analysis both for the full sample (Panel A) and for the sub-sample of energy and telecom companies (Panel B).

Figure 1 shows the average market-to-book ratios for private and state controlled firms from 3 years before the IRA set up to 3 years after the IRA establishment, using the 57 energy and telecom firms. If we define as state-controlled those companies where *Government UCR* are equal to or greater than 30%, we notice that the average market to book ratio of state controlled firms is lower before the switch (year 0), but thereafter starts growing and, in the second and third year after the IRA setup, is definitively larger: +20% and + 15%, respectively. In contrast, the average *MTB* of private companies decreased from 1.33, at the regime switch, to 1.22 three years later.

5. The Effect of State Ownership on the Market Value of Regulated Firms

We estimate the following regression:

$$MTB_{it} = \alpha_0 + \alpha_1 GovernmentUCR_{i,t-1} + \alpha_2 IRA_{i,t-1} + \alpha_3 GovernmentUCR_{i,t-1} * IRA_{i,t-1}$$
$$+ \alpha_4 \mathbf{X}_{i,t-1} + \alpha_5 \mathbf{Y}_{i,t} + \sum_i \mu_i Firm_i + \sum_t \lambda_t Year_t + \varepsilon_{it}, \tag{1}$$

where MTB_{it} is the *Market-to-Book* ratio of firm *i* in year *t*, $GovernmentUCR_{i,t-1}$ and $IRA_{i,t-1}$ are the lagged values of the continuous government ultimate control rights variable and of the IRA dummy, $GovernmentUCR_{i,t-1} * IRA_{i,t-1}$ is the interaction term that allows us to test for the effect of residual State ownership when the IRA is in place,[13] X_{it-1} is a vector of firm-specific variables, Y_{it} is a vector of country-specific variables, μ_i and λ_t are firm and year fixed effects while ε_{it} is an error term. The vector of firm controls in this regression includes the *Log of Real Total Assets* to control for size, the *EBIT-to-Total Assets* ratio to control for profitability/efficiency and the financial *Leverage*, defined as total financial debt divided by the sum of book equity and total financial debt.[14] The vector of country-specific controls includes *GDP growth* and the *Investor Protection* index. To

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[13] A similar approach was used by Kwoka (2002 and 2006) to assess the differences across private and public ownership in the prices charged by U.S. electric utilities and in their cost efficiency.

[14] This specification is rather standard in the literature (see, for example, Morck, Shleifer and Vishny, 1988; McConnell and Servaes, 1990; Lang, Ofek and Stulz, 1996). The reason for not using market leverage is to avoid the spurious correlation resulting from the fact that the market value of equity appears both in the numerator of *Market-to-Book* and in the denominator of market leverage.

partly address potential reverse causality, we lag all firm variables one year and moreover we add firm-specific fixed effects to filter out unobserved firm heterogeneity that is constant over time.

In Table 4, we present the O.L.S. fixed effect coefficients for the EU regulated utilities (columns (1) and (2)) and for the sub-sample of 57 regulated energy and telecom firms that, following the EC directives, at some point in time - mostly from 1996 to 2000 - implemented the new regulatory regime. In Columns (3) and (4), we thus focus on the changes in the market value of private vs. public firms after they became subject to an IRA.

The results show that the market to book ratio is negatively related to firm size and that market value is larger in countries where investor rights are better protected by the law and GDP growth is faster. In Column (1), we find that neither state ownership nor the IRA dummy has, separately, a significant effect. Column (2) adds the interaction between *Government UCR* and *IRA*. We find that the coefficient on *Government UCR* turns significantly negative, while its interaction with IRA is positive and highly significant. The positive coefficient on the interacted terms suggests that when the IRA is in place, the larger the share held by the State, the higher the firm market value. In Columns (3) and (4), the results for the control variables are less precisely estimated, probably due to the exclusion of firms that either had the IRA from the start or never became subject to an IRA, which sort of reduced the heterogeneity in the data. Notwithstanding this, in Column (3) we find that the coefficient on *GovernmentUCR* is positive and significant and, in Column (4), when we consider the effect of public ownership under the IRA, the standalone *GovernmentUCR* variable is no longer significant while the interaction term is positive and significant. This latter result is consistent with the graphical evidence in Figure 1.

In the next section, we interpret this finding, analyzing its political economy implications. For this analysis, we focus on the sub-sample of firms operating in the energy and telecom sectors where IRAs have been established. We report the results for the full sample in the Appendix.

6. Firm Value and State Ownership: the Role of Political Institutions

Our next step is to examine the driving forces that may explain the positive impact of residual state ownership on firm value when the IRA exists. In Section 3, we argued that the quality of a country's political institutions disciplines the discretionary power of the government and its latitude to interfere with the regulatory policy. To implement an empirical test we first investigate whether the response of firm value to different regulatory and ownership regimes differs across "weak" vs. "strong" political institutions as measured by two country-specific indices: *Checks and Balances* and *Electoral Disproportionality* (Section 6.1). We then address the potential endogeneity

of *Government UCR*, *IRA* and of their interaction by incorporating the role of political institutions straight into a specific identifying assumption, i.e. that *Checks and Balances* and *Disproportionality* are valid instruments in a regression of partially privatized regulated firms' market-to-book ratio (Section 6.2).

6.1 Weak vs. Strong Political Institutions: Evidence from Sub-samples

We estimate market value regressions where we split our sample energy and telecom firms based on *Checks and Balances* (*C&B*) in Table 5, and *Electoral Disproportionality* in Table 6. The indexes allow for institutional changes over time as well as firms shifting across the "high"-"low" categories. To classify country-years observations with the strongest countervailing powers, we refer to values of the *C&B* index at the top quartile of its distribution – more specifically, when *C&B* is greater than 4 (and symmetrically, for observations with *C&B* less than or equal to 4). Based on country averages, Denmark, Holland, Belgium and Germany exhibit the highest scoresand Greece, Portugal, Spain and Italy the lowest. Figure 3 reports the trends of the political institutions indexes for two selected countries at the top and at the bottom ends of the distributions, i.e. Denmark and Germany, Spain and Italy, respectively.

The empirical results in Table 5 are consistent with our predictions. In countries where institutional checks and balances are weaker, larger government's ownership stakes lead to higher *MTB* ratios for the regulated firms. The evidence is weaker in Column (1) where we do not account for the presence of the IRA, but is very strong where we do, in Column (2). The results strikingly differ when we turn to Columns (3) and (4), where the countervailing powers are supposed to restrain interference from the executive more efficiently. In both specifications, the IRA dummy is positive and significant which suggests that where IRAs are expected to act independently (as envisioned by the EC directives), capital markets assign a premium to the reduced regulatory uncertainty that follows regulatory commitment (see Cambini and Rondi, 2011, for evidence on fixed investment). Moreover, in Column (4), the interaction between *GovernmentUCR* and the *IRA* dummy is negatively correlated with firm value, and this is consistent with the typical negative outlook assigned to state-controlled regulated utilities.

To classify country-years observations where policy reversals are supposed to be less likely owing to the electoral system, we refer to low values of the *Electoral Disproportionality* index. Recall that low values of the index indicate highly fragmented political systems and divided

governments, which according to Levy and Spiller (1994)[15], favor regulatory commitment while, incontrast, more cohesive governments typical of majoritarian systems have more room to interfere in regulatory decisions. Indeed, we notice that, on average, *Electoral Disproportionality* is negatively correlated with *C&Bs*, suggesting that checks and balances tend to be less effective in majoritarian systems. Again using country averages, we find that Denmark, Holland, Germany and Sweden score lower *Disproportionality Indexes,* while, at the opposite end of the distribution, France (the most majoritarian system), the UK, Greece and Italy score the higher indexes. In Figure 3, we plot the evolution of both *Checks and Balances* and *Disproportionality* for a subset of countries.

In Table 6, we report the results of the *MTB* equation when the sample is split according to the electoral rule. To allow straightforward comparability with the results in Table 5, we inverted the *Disproportionality* index to generate an *Electoral Proportionality* (*EP*) index so that *high* proportionality has, by construction, an effect similar to *high* checks and balances. To separate the sample, we thus use a threshold value of *Electoral Proportionality* of 28.5 to split the sample (i.e. the 75th percentile value of the distribution of the inverted *Disproportionality* index). The results in Table 6 show that, as the electoral rule becomes less proportional (hence in countries with more majoritarian parliamentary systems), the larger the stake held by the state, the higher the firm market value, particularly if the IRA is in place as shown by the positive and statistically significant coefficient on the *GovernmentUCR*IRA* interaction in Column (2). In contrast, when we focus on the sub-sample with more fragmented parliamentary systems, residual state ownership of regulated firms is irrelevant (see Columns (3) and (4)).

Our results in Tables 5 and 6 suggest that the exploitation of political leverage to obtain higher value (through political interference in regulatory decisions) does not occur whenever regulation is granted independence by countervailing powers constraining the power of the executive. In this case, regulatory policy is enforced independently of government residual stakes in firms.[16]

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[15] Spiller and Urbiztondo (1994) also show that the probability of observing more independent agencies is higher in systems characterized by divided governments.

[16] In the Appendix, we apply the same sub-sampling strategy to the full sample (i.e. including also firms in utility sectors regulated not by an independent authority, but by a branch of the government such as ministries or governmental committees). We find that the results are very similar: under low checks and balances systems and less fragmented party systems, a larger governments stake leads to higher firm value.

6.2 Instrumental variable results

The results reported in the previous section support the idea of reluctant regulation as a possible factor explaining why state ownership benefits public utilities. We now try to find more systematic evidence from instrumental variable estimation. In Section 3 we argued that state ownership could affect its market value only when weak political institutions allow government's interference through reluctant regulation. To test this prediction, we now estimate the effect of political institutions by two-stage least squares (2SLS), using *Checks and Balances*, or *Electoral Proportionality*, and other country-specific variables (political orientation, the debt to GDP ratio, and market openness) as instruments for *Government UCR*, *IRA* and their interaction (*Government UCR*IRA*). Because we have more instruments than endogenous variables, our statistical model is over-identified. We thus test the over-identifying restrictions and identify the impact of both state ownership and IRA on firm value by testing the exclusion restriction that *Checks and Balances* and *Electoral Proportionality* do not appear in the second stage estimation of firm market value, *MTB* (we perform a similar test also for the other instruments).

In Table 7.1, we present the first-stage regressions for *Government UCR*, *IRA* and their interaction when we use *Checks and Balances* (Columns (1), (3) and (5)) and *Electoral Proportionality* (Columns (2), (4) and (6)) in the instrument sets. In Columns (1) and (2), the negative coefficients on Political Orientation indicate that state ownership tends to be lower when the executive is more "right-wing", while the positive coefficients on the OECD index suggest that larger government stakes tend to be associated with less open and less liberalized markets. Columns (3) and (4) suggest that IRAs were primarily set up when the Debt-to-GDP ratio is highest, probably because EU member states tend to be more eager to comply with institutional requirements when they are under fiscal distress. In addition, the inception of an IRA is positively associated with right-wing governments, market openness, and electoral proportionality, and negatively related to checks and balances (but recall that the IRAs were setup following EU Directives, so these results may reflect the timing of the implementation of the norm). More importantly for our point of view, Columns (5) and (6) show that, when the IRA is in place, residual state ownership tend to be larger where the institutional checks and balances are weaker and electoral proportionality is lower. This evidence is consistent with the idea that strong, less accountable executives do not wish to relinquish control over politically sensitive public utilities from which they can extract economic rents. Overall the first-stage results deliver an important message: of all the instruments we used, only *Checks and Balances* and *Electoral Proportionality* are significant determinants of all the endogenous variables. More to the point, they are the only significant explanatory variables of the interaction term that capture the residual state ownership under the IRA (Columns (5) and (6)).

In Table 7.2, we present the 2SLS results where we test the over-identifying restrictions by calculating the Sargan-Hansen and the Difference in Sargan statistics as well as by including *C&B* and *EP* directly in the second-stage regressions.

Columns (1) and (3) report the 2SLS estimates when we use, respectively, *C&B* and *EP* in the instrument set, along with political orientation, debt to GDP ratio and the OECD market liberalization index. The results show that the interaction *Government UCR*IRA* is positive and significant in all columns, which supports our hypothesis that the presence of the government as a (residual) shareholder boosts the regulated firm's value providing a sort of indirect governmental protection that is apparently recognized and rewarded by the capital markets.

Comfortingly, the J statistics shows that the sets of instruments we use in both specifications are valid and the Difference in Sargan tests on the political institution variables confirm that they are valid instruments. However, we further test the exclusion restrictions by entering *C&B* and *EP* in the second stage, in Columns (2) and (4) respectively. The results confirm the validity of our identification strategy, as both instruments, once included in the MTB regression, are statistically insignificant.[17] This analysis shows that (weak) political institutions affect firms' market value, but only through the effect of residual government stakes in regulated firms. We set forth reluctant regulation as an important channel to explain the valuation effect of government's shareholdings in public utilities.

7. Robustness Tests

As noted in Section 2, from a country level perspective, the UK is the EU member state where the institutional reforms started earlier. More precisely, independent regulators in telecommunications, energy and water supply were set up in the Eighties and most firms were fully privatized even before. The peculiarity and relevance of the UK suggest us to check the robustness of our results on a sample that excludes UK firms. In Table 8 we re-estimate the model with the interaction between *Government UCR* and *IRA* for the full sample of non-UK firms as well as for the sub-samples with low *C&B* and *Electoral Proportionality*. Comfortingly, the results support our predictions and are very similar to those reported in Tables 5-7 and even sharper. In columns (1) and (2), both the OLS and the 2SLS estimated coefficients on the *Government UCR*IRA* interacted variable are positive and highly significant. Moreover, the positive coefficients are significant and larger in the market value regressions for the firm-year observations subject to weaker checks and balances and less proportional party systems. This analysis confirms that our results were not

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[17] We perform similar tests on the other instruments, by including them, one at the time, in the second stage regressions. We found that none of them were statistically significant. Results are available upon request.

sensitive to the presence (or the absence) of a country, such as the UK where privatization and liberalization reforms date back to the Eighties.

In the second robustness check, we replace the continuous ownership variable with a dummy to control whether the results hold for regulated firms where the state maintains a stake large enough to reasonably ensure relative power and discretionality in managerial decisions. So we use a plausible threshold of state ownership, i.e. a dummy that equals 1 when the Government UCR are equal to and greater than 30%, to account for the fact that the state as a shareholder is likely to exercise control even when it holds less than the majority interest. Table 9 reports the results from estimating the specification with the interaction between the IRA dummy and the ownership dummy *UCR_30%*. We find that the presence of the state as a shareholder with (at least) a 30% stake positively and significantly affects the market value, but only when we control for the endogeneity ownership variable and its interaction with the IRA dummy (Column (2)). The positive effect, however, becomes strongly significant when we turn to the sub-sample of observations in countries with low checks and balances (in Column (3)) and less proportional electoral rules hence more majoritarian government systems (in Column (4)). Consistently with our theoretical framework, in such political environments governments maintain the latitude to interfere with regulatory decisions, and politicians may find it convenient to slow down privatizations.

Finally, it may be argued that our state controlled companies operate in sectors where competition is still limited and, therefore, that our results capture part of this market power. According to an OECD report by Conway and Nicoletti (2006, p.6), the presence of public ownership hinders competition in some sectors: "with public enterprises often enjoying soft budget constraints and state guarantees, the playing field is not level in markets where they operate". We thus use the OECD index of product market regulation to test the impact of the intensity of competition on firm market value, following the same strategy employed for political institutions. We thus first split the sample using a threshold value of *OECD Index of Liberalization* to estimate the effect of government control in industries with high (index below 0.8, i.e. the 25th percentile value of the distribution of the index) and low (index above 0.8) competition. The results show that *Government UCR*IRA* is never significant, whether markets are more or less liberalized, both for the full sample and for the telecom and energy sub-sample. Second, we check the direct impact of competition by introducing the index as a regressor in the IV second-stage regression. We find that the *OECD Index of Liberalization* is insignificant, while *Government UCR*IRA* remains positive

and highly significant. In sum, the positive effect of government ownership on regulated firms' market value is not driven by the intensity of market openness and liberalization.[18]

8. Conclusions

Over the last 20 years and around the world, regulatory competencies in network industries have been delegated to independent agencies in order to improve market efficiency and to discipline the conflict of interest stemming from the dual role of the state as owner and regulator. However, despite significant efforts and structural reforms, most utilities, in Europe and elsewhere, are still owned and often controlled by the state. Consequently, regulatory independence and residual state ownership are intertwined institutional features that affect firm real and financial decisions, and ultimately market value.

In this paper, we study empirically the relationship between state ownership and firms' value when companies are subject to independent regulation. Using a large sample of European utilities, we show state ownership is positively associated with firm value and that this effect is strong and significant in countries where weak checks and balances and lower political fragmentation do not constrain the power of the executive. Hence, where political institutions are weak, politicians imperfectly delegate powers to regulatory agencies in order to benefit state-owned firms. We label the creation of formally but not *de facto* independent agencies *reluctant regulation*, a new concept which allows us to explain why governments stakes are associated with higher valuations, and why privatization is so often partial and incomplete in network industries.

Our results point out a possible regulatory failure in industrial organizations dominated by state controlled incumbents and characterized by reluctant regulation. Under these circumstances, the state apparently enjoys and shares with private shareholders an undue economic rent at the expense of consumers. Given the prevalence of state controlled utilities and the strong power wielded by national governments, this conclusion raises concerns about the effectiveness of privatization and regulatory policies in network industries in Europe. To address the problem and therefore to make the recent structural reforms on network industries more credible, national governments may push forward privatization to eliminate the potential conflict of interest, or improve regulatory institutions in the direction of an enhanced independence and public accountability.

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[18] We do not report the results for reason of space, but they are available from the authors upon request.

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Figure 1 – Market to book ratios at the IRA inception, before and after the event

(Sample: firms undergoing the change in regulatory regime; ownership threshold at 30%)
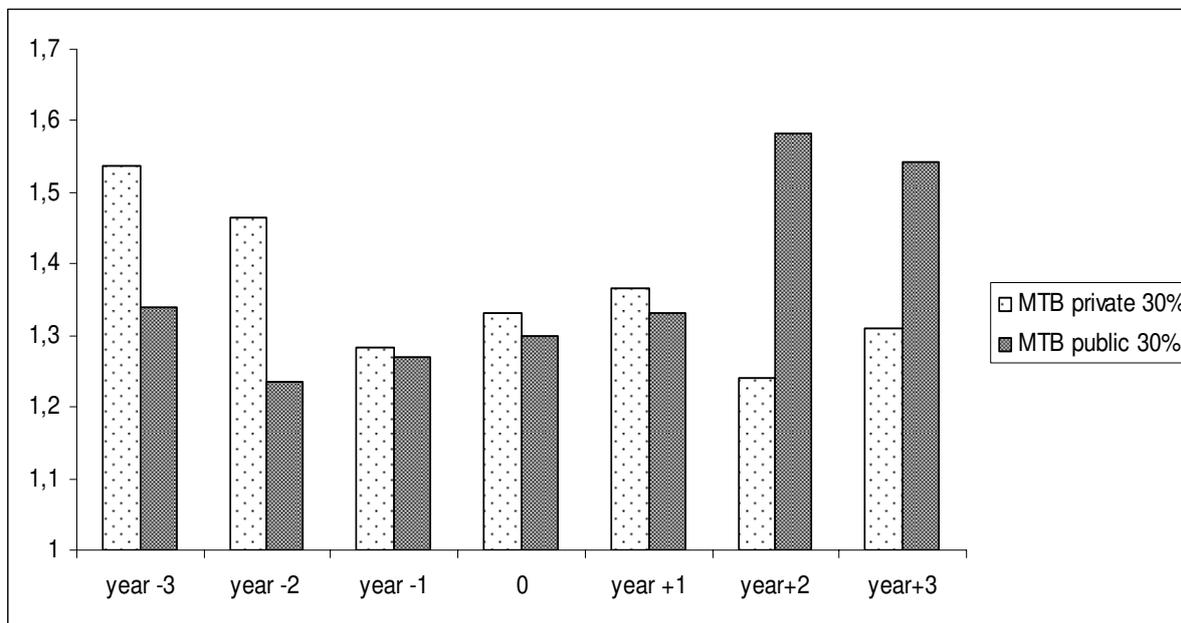
Figure 2. The evolution of the government control rights in EU utilities: the case of Telecom Portugal
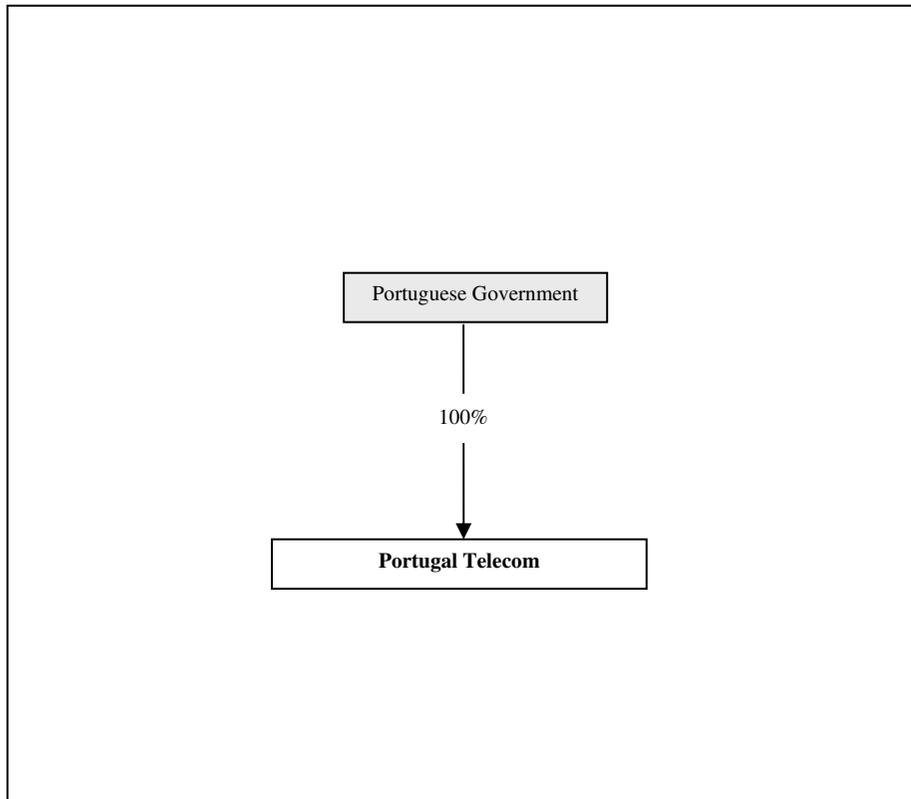
As of the end of 1994   *As of the end of 2004*
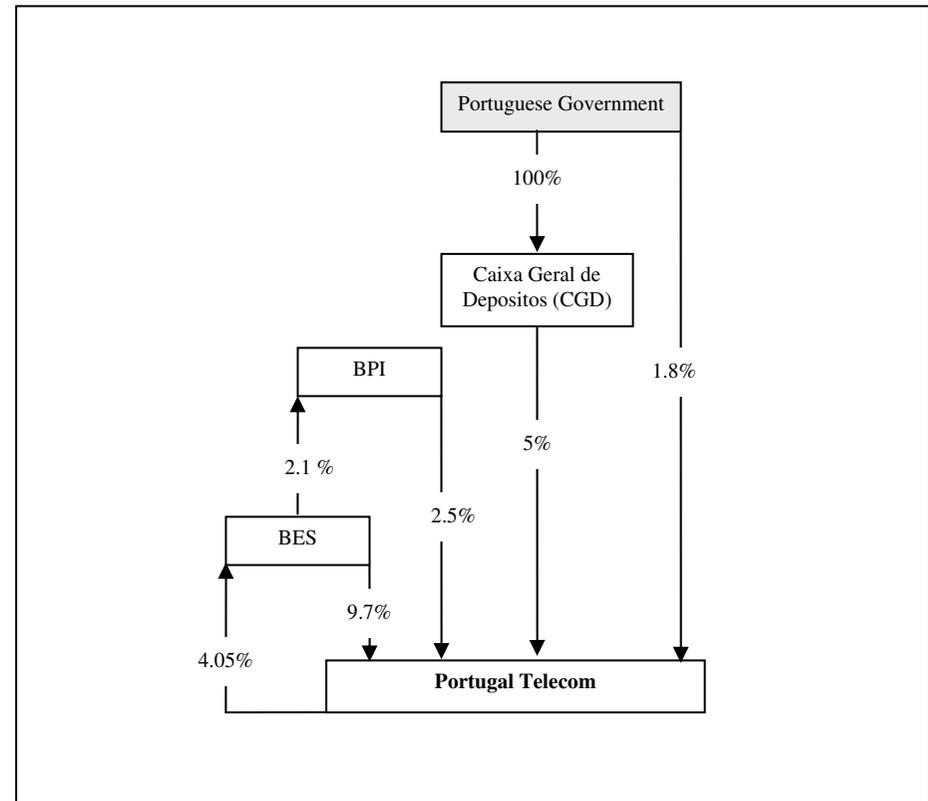
Figure 3
Political indicators in selected EU countries
Checks & Balances **– source: Beck et al. (2001) - and**
*Gallagher Political Institutions Disproportionality Index (***source: Gallagher, 1991, and Bortolotti and Pinotti, 2008)**

Spain
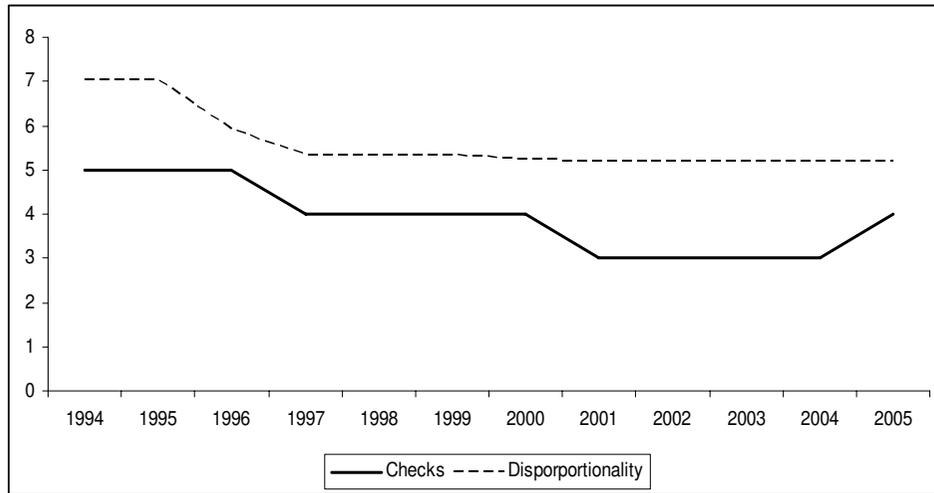
Italy
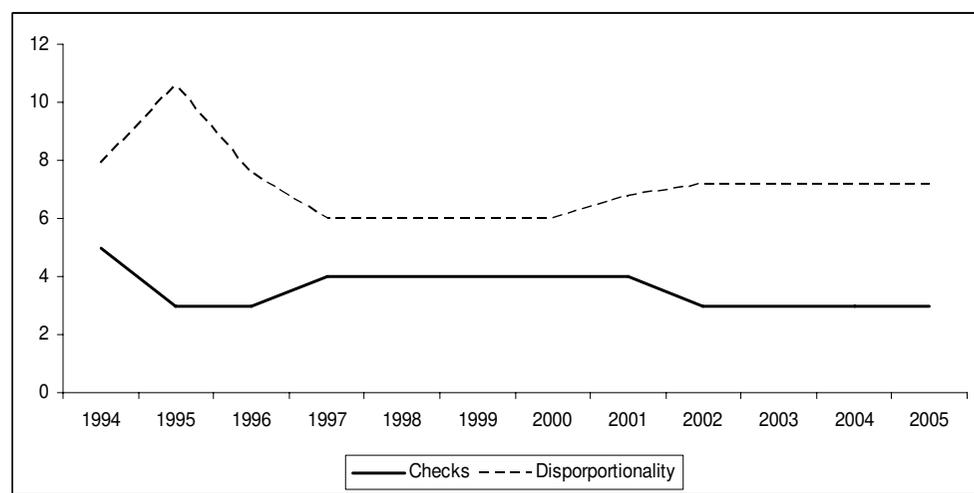
Germany
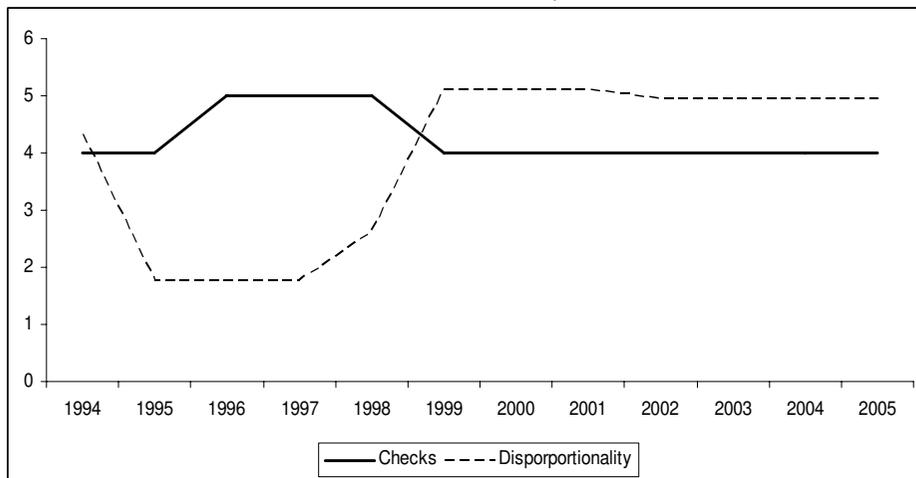
Denmark
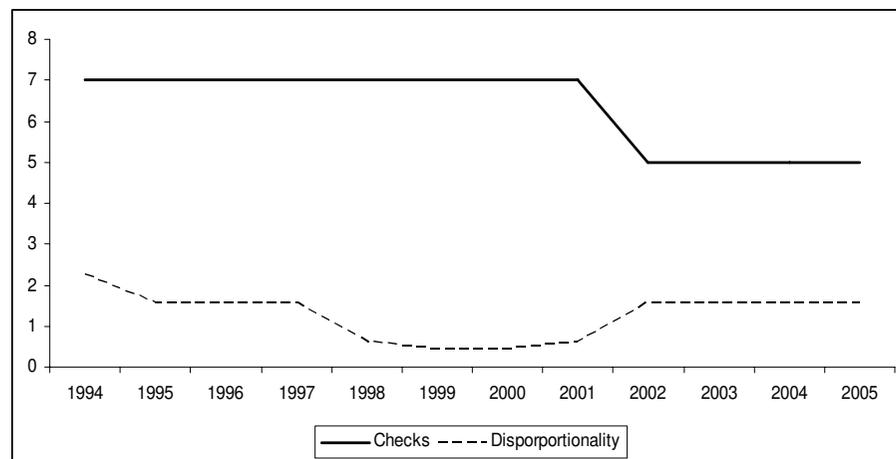
Table 1 -- Timing of regulation and privatization in the energy and telecommunications sectors in European countries

Country	Energy (Electricity & Gas)					Telecommunications			
	Date of establishment of IRA	Liberalization Reform in Electricity (Directive 96/92)	Liberalization Reform in Gas (Directive 98/30)	Privatization revenues in energy raised before the transposition Directives	Privatization revenues in energy raised before the establishment of the IRA	Date of establishment of IRA	Liberalization Reform in Telecoms (Directive 90/388)	Privatization revenues in TLC raised before the transposition Directives	Privatization revenues in TLC raised before the establishment of IRA
Italy	1995	1999	2000	30.52%	0	1997	1997	5.72%	5.72%
UK	1989	2000	2000	100%	18.60%	1984	1997	94.84%	3.07%
Spain	1998	1997	1998	23.91%	52.62%	1996	1997	22.17%	22.17%
France	2000	2000	2003	2.54%	2.54%	1996	1996	2.24%	2.24%
Portugal	1995	1999	2006	66.58%	12.94%	2001	1997	31.19%	100%
Germany	2006	1998	2003	63.15%	100%	1996	1996	0%	0%
Netherlands	1998	1998	2001	16.11%	0%	1997	1998	42.84%	41.86%
Austria	2000	1998	2000	55.40%	70.76%	1997	1997	0%	0%
Sweden	1998	1997	2004	0%	0%	1992	1997	0%	0%
Finland	1995	1998	-	4.47%	0.42%	1987	1997	0.10%	0%
Greece	2000	1999	Failure to transpose	2.40%	0%	1992	1999	50.20%	0%
Belgium	1999	2000	1999	10.12%	10.12%	1991	1997	79.33%	0%
Ireland	1999	1999	2000	-	-	1997	1996	0%	0%
Denmark	1999	1996	2001	0%	0%	2002	1996	48.54%	100%

Table 2 – The top 20 European regulated companies by market capitalization

Company Name	Country	Date of Establishment of an IRA	IPO Year	Market Capitalization (US$bn, end 2005)	Government Control Rights (end 2005)
Panel A: Telecommunications					
Telefonica de Espana SA	Spain	1996	1987	71.88	0.000
Deutsche Telekom AG	Germany	1996	1996	69.74	0.575
France Telecom	France	1996	1997	64.58	0.324
Telecom Italia SpA	Italy	1997	1997	56.04	0.000
British Telecommunications PLC	U.K.	1984	1991	33.02	0.000
Telia Sonera AB	Sweden	1992	2000	24.10	0.590
Koninklijke KPN NV	Netherlands	1997	1994	21.32	0.078
TeleDanmark AS	Denmark	2002	1994	11.64	0.000
Portugal Telecom SA	Portugal	2001	1995	11.27	0.127
Telekom Austria AG	Austria	1997	2000	10.83	0.302
Panel B: Energy					
Electricité de France	France	2000	2005	68.88	0.873
E.ON	Germany	2006	1987	68.14	0.048
Enel	Italy	1995	1999	48.29	0.322
RWE	Germany	2006	1922	41.47	0.310
Suez	France	2000	1987	39.10	0.197
Vivendi	France	2000	2000	36.00	0.124
British Gas PLC	U.K.	1989	1986	35.03	0.000
Gaz de France	France	2000	2005	28.80	0.801
National Grid Transo PLC	U.K.	1989	1995	28.67	0.000
Iberdola	Spain	1998	1992	24.60	0.020

Table 3 - Summary statistics

Panel A: Full sample

Variable	Mean	Std. Dev.	Min	Max	No. Obs.
Market-to-Book	1.389	0.489	0.572	4.351	765
Book Leverage	0.272	0.215	0	1	763
Log of Real Total Asset	11.003	1.803	5.694	14.506	765
EBIT-to-Total Asset	0.074	0.105	-1.948	0.299	755
Government's UCR	0.271	0.302	0	1	765
Independence Regulatory Agency dummy	0.605	0.489	0	1	765
Investor Protection Index	3.935	1.197	1	5	765
GDP Growth	2.446	1.372	-1.12	10.72	765
Checks and balances Index	3.780	0.927	2	7	765
Political Constraints Index	0.743	0.078	0.363	0.894	765
Disproportionality Index	10.334	7.830	0.428	33.739	765
Political Orientation Index	5.762	1.517	3.665	8.025	765
Public Debt to GDP Ratio	0.673	0.262	0.273	1.243	723

Panel B: Sub sample of energy and telecom firms

Variable	Mean	Std. Dev.	Min	Max	No. Obs.
Market-to-Book	1.389	0.472	0.572	4.352	493
Book Leverage	0.311	0.211	0	1	492
Log of Real Total Asset	11.538	1.551	6.680	14.506	493
EBIT-to-Total Asset	0.068	0.120	-1.948	0.299	483
Government's UCR	0.285	0.285	0	1	493
Independence Regulatory Agency dummy	0.799	0.401	0	1	493
Investor Protection Index	3.817	1.163	1	5	493
GDP Growth	2.417	1.434	-1.12	10.72	493
Checks and balances Index	3.836	0.937	2	7	493
Political Constraints Index	0.752	0.071	0.363	0.894	493
Disproportionality Index	8.943	7.238	0.428	33.739	493
Political Orientation Index	5.806	1.501	3.665	8.025	493
Public Debt to GDP Ratio	0.677	0.253	0.273	1.243	469

Table 4 – Market value, government ownership and IRA - OLS estimates

The dependent variable is the Market-to-Book ratio defined as (Total Assets - Book Value of Equity + Market Value of Equity)/Total Assets). *Government UCR* is a continuous variable constructed by Bortolotti and Faccio (2009), which uses the weakest link approach to measure the State's ultimate control rights. *IRA* is a dummy equal to 1 if an independent regulatory agency (IRA) is in place and is equal to 0 otherwise. *Investor Protection* is the time-varying "antidirector rights" index by Pagano and Volpin (2005). The explanatory variables are defined in Section 4.1. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. ***, **, * denote significance at 1%, 5% and 10%.

Dependent variable: MTB ratio	(1)	(2)	(3)	(4)
	Full sample		**Telecoms and Energy sample**	
Leverage$_{t-1}$	-0.091	-0.083	0.060	0.049
	(0.103)	*(0.102)*	*(0.261)*	*(0.254)*
EBIT-to-Total Assets$_{t-1}$	0.218	0.208	0.611	0.581
	(0.135)	*(0.131)*	*(0.500)*	*(0.218)*
Log of real total assets$_{t-1}$	-0.192***	-0.184**	-0.317**	-0.308**
	(0.075)	*(0.078)*	*(0.141)*	*(0.138)*
Investor Protection$_t$	0.066*	0.057*	0.025	0.004
	(0.035)	*(0.034)*	*(0.084)*	*(0.072)*
GDP Growth$_t$	0.079**	0.085**	-0.001	0.018
	(0.034)	*(0.033)*	*(0.043)*	*(0.040)*
Government UCR$_{t-1}$	-0.110	-0.267**	1.190*	0.500
	(0.158)	*(0.134)*	*(0.657)*	*(0.414)*
IRA$_{t-1}$	0.030	-0.067	0.178	-0.131
	(0.078)	*(0.093)*	*(0.127)*	*(0.105)*
Government UCR$_{t-1}$ * IRA	-	0.377***	-	0.996**
	-	*(0.195)*	-	*(0.487)*
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
R squared	0.255	0.262	0.191	0.202
F Test (*p value*)	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	88 [696]	88 [696]	57 [451]	57 [451]

Table 5 –The role of political institutions: checks and balances - OLS estimates

Sample of energy and telecom regulated firms. The dependent variable is the Market-to-Book ratio defined as (Total Assets - Book Value of Equity + Market Value of Equity)/Total Assets). The explanatory variables are defined similarly to Table 4. C&B is the *Checks & Balances*, a time-varying index, ranging from 0 to 7, that measures the number of veto powers in the political system according to specific legislative and executive indexes of electoral competitiveness (World Bank Database on Political Institutions). Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. ***, **, * denote significance at 1%, 5% and 10%.

	Checks and Balances			
Dependent variable: MTB ratio	(1)	(2)	(3)	(4)
	Low C&B	*Low C&B*	*High C&B*	*High C&B*
Leverage$_{t-1}$	-0.211	-0.232	0.055	0.063
	(0.146)	*(0.145)*	*(0.200)*	*(0.169)*
EBIT-to-Total Assets$_{t-1}$	0.201	0.184	-0.692	-1.188
	(0.147)	*(0.131)*	*(0.874)*	*(0.942)*
Log of real total assets$_{t-1}$	-0.196**	-0.207**	-0.107	-0.174
	(0.089)	*(0.085)*	*(0.226)*	*(0.212)*
Investor Protection$_t$	-0.015	-0.029	0.004	0.025
	(0.049)	*(0.042)*	*(0.182)*	*(0.189)*
GDP Growth$_t$	-0.011	-0.008	0.056	-0.003
	(0.033)	*(0.031)*	*(0.090)*	*(0.086)*
Government UCR$_{t-1}$	0.232	-0.294	-0.812	-0.813
	(0.190)	*(0.230)*	*(0.671)*	*(0.555)*
IRA$_{t-1}$	0.060	-0.147	0.508**	1.080***
	(0.110)	*(0.140)*	*(0.232)*	*(0.398)*
Government UCR$_{t-1}$ * IRA	-	0.726***	-	-1.443***
	-	*(0.250)*	-	*(0.549)*
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
R squared	0.308	0.326	0.486	0.518
F Test (*p value*)	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	50 [353]	50 [353]	22 [93]	22 [93]

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Table 6 – The role of political institutions: electoral system - OLS estimates

Sample of energy and telecom regulated firms. The dependent variable is the Market-to-Book ratio defined as (Total Assets - Book Value of Equity + Market Value of Equity)/Total Assets). The explanatory variables are defined similarly to Table 4. The *Proportionality Index* by Gallagher (1991), updated by Bortolotti and Pinotti (2008) is a continuous and time varying index of parliamentary fragmentation. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. ***, **, * denote significance at 1%, 5% and 10%.

Dependent variable: MTB ratio	*Degree of electoral proportionality*			
	(1)	(2)	(3)	(4)
	Low proportionality	*Low proportionality*	*High proportionality*	*High proportionality*
Leverage$_{t-1}$	-0.291**	-0.323**	0.275	0.249
	(0.144)	*(0.142)*	*(0.291)*	*(0.312)*
EBIT-to-Total Assets$_{t-1}$	0.155	0.147	-0.772	-0.815*
	(0.154)	*(0.140)*	*(0.523)*	*(0.493)*
Log of real total assets$_{t-1}$	-0.208**	-0.227**	-0.503***	-0.483***
	(0.104)	*(0.098)*	*(0.174)*	*(0.184)*
Investor Protection$_t$	-0.011	-0.033	0.280*	0.271[1]
	(0.052)	*(0.048)*	*(0.161)*	*(0.171)*
GDP Growth$_t$	-0.002	0.013	0.050	0.052
	(0.062)	*(0.059)*	*(0.081)*	*(0.077)*
Government UCR$_{t-1}$	0.257	-0.374	-0.390	-0.538
	(0.185)	*(0.308)*	*(0.487)*	*(0.395)*
IRA$_{t-1}$	0.099	-0.080	0.122	0.017
	(0.099)	*(0.114)*	*(0.167)*	*(0.267)*
Government UCR$_{t-1}$ * IRA	-	0.942***	-	0.230
	-	*(0.344)*	-	*(0.326)*
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
R squared	0.364	0.381	0.451	0.454
F Test (*p value*)	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	38 [271]	38 [271]	26 [177]	26 [177]

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[1] P value = 0.112

Table 7.1 - Market to book and the role of political and institutional variables:
First stage analysis

Sample of energy and telecom regulated firms. *Political orientation, Debt to GDP*, and *OECD Index of Liberalization* are defined in Section 4. *Checks & Balances* and *Proportionality Index* are defined in Tables 5 and 6 respectively and in Section 3. Firm and year dummies included. Robust standard errors in parentheses. ***, **, * denote significance at 1%, 5% and 10%.

Dependent variable:	Government UCR_t (1)	Government UCR_t (2)	IRA_t (3)	IRA_t (4)	Government $UCR_t * IRA$ (5)	Government $UCR_t * IRA$ (6)
Political Orientation $_{t-1}$	-0.014**	-0.004	0.059***	0.054***	0.000	0.009
	(0.006)	(0.006)	(0.012)	(0.014)	(0.007)	(0.007)
Debt/GDP $_{t-1}$	0.138	-0.110	0.582	0.706**	0.280	0.064
	(0.180)	(0.173)	(0.365)	(0.359)	(0.214)	(0.216)
OECD Index of Liberalization $_{t-1}$	0.021**	0.014	-0.032	-0.038**	-0.005	-0.012
	(0.010)	(0.010)	(0.020)	(0.019)	(0.013)	(0.013)
Checks & Balances $_{t-1}$	-0.034*	-	-0.063**	-	-0.037*	-
	(0.019)	-	(0.028)	-	(0.020)	-
Proportionality Index $_{t-1}$	-	-0.038***	-	0.032*	-	-0.032***
	-	(0.008)	-	(0.017)	-	(0.008)

Additional instruments: Leverage, EBIT-Total Assets, Log Tot Assets, Investor protection, GDP growth

F Test (*p value*)	0.000	0.000	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	57 [424]	57 [424]	57 [424]	57 [424]	57 [424]	57 [424]

Table 7.2 - Market to book and the role of political and institutional variables:

Second stage results and test of the exclusion restrictions

Sample of energy and telecom regulated firms. 2SLS estimates. The dependent variable is the Market-to-Book ratio defined as (Total Assets - Book Value of Equity + Market Value of Equity)/Total Assets). The explanatory variables are defined similarly to Table 4. C&B is the *Checks & Balances*, a time-varying index, ranging from 0 to 7, that measures the number of veto powers in the political system according to specific legislative and executive indexes of electoral competitiveness (World Bank Database on Political Institutions). The *Proportionality Index* by Gallagher (1991), updated by Bortolotti and Pinotti (2008) is a continuous and time varying index of parliamentary fragmentation. *Checks & Balances* is included as instrument in Col. 1 and as regressor in Col. 2. *Proportionality Index* is included as instrument in Col. 3 and as regressor in Col. 4. The Hansen J statistic tests the null of the validity of all instruments, the C statistics is the difference-in-Sargan test that suspect regressors or instruments are exogenous. Firm and year dummies included. Robust standard errors in parentheses. ***, **, * denote significance at 1%, 5% and 10%.

Dependent variable:	MTB_t	MTB_t	MTB_t	MTB_t
	(1)	**(2)**	**(3)**	**(4)**
Leverage$_{t-1}$	-0.193	-0.212	-0.263**	-0.220
	(0.143)	*(0.140)*	*(0.133)*	*(0.163)*
EBIT-to-Total Assets$_{t-1}$	0.112	0.126	0.178	0.151
	(0.120)	*(0.111)*	*(0.110)*	*(0.109)*
Log of real total assets$_{t-1}$	-0.156**	-0.170**	-0.226***	-0.195**
	(0.066)	*(0.080)*	*(0.066)*	*(0.104)*
Investor Protection$_t$	-0.032	-0.021	-0.043	-0.064
	(0.067)	*(0.069)*	*(0.058)*	*(0.062)*
GDP Growth$_t$	0.081*	0.083*	0.085*	0.075
	(0.048)	*(0.049)*	*(0.047)*	*(0.065)*
Government UCR$_{t-1}$	0.154	-0.424	-2.178	-1.102
	(1.508)	*(2.058)*	*(1.721)*	*(3.228)*
IRA$_{t-1}$	-0.584	-0.788	-1.130*	-1.007
	(0.437)	*(0.645)*	*(0.609)*	*(0.688)*
Government UCR$_{t-1}$ * IRA	2.125**	2.280**	2.438**	2.525**
	(0.877)	*(1.039)*	*(1.212)*	*(1.051)*
Checks & Balances $_{t-1}$	-	-0.038	-	-
	-	*(0.105)*	-	-
Proportionality Index $_{t-1}$	-	-	-	0.043
	-	-	-	*(0.091)*

Instrumented Variables: Government UCR$_{t-1}$*IRA, IRA$_{t-1}$, Government UCR$_{t-1}$

Hansen J (all instruments) (*p value*)	0.940	0.996	0.655	0.427
Diff-in-Sargan C test:				
C&B Index / Prop. Index (*p value*)	0.726	0.990	0.358	0.426
F Test (*p value*)	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	57 [424]	57 [424]	57 [424]	57 [424]

Table 8 –Robustness: market value, ownership and IRA excluding UK firms

Sample of energy and telecom regulated firms. The dependent variable is the *Market-to-Book ratio* defined as (Total Assets - Book Value of Equity + Market Value of Equity)/Total Assets). The explanatory variables are defined similarly to Table 4. C&B (*Checks & Balances*), the *Political Constraints* and the *Disproportionality Indexes* are defined as in Table 6. The Hansen J statistic tests the null of the validity of all instruments, the C statistics is the difference-in-Sargan test that suspect regressors or instruments are exogenous. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. ***, **, * denote significance at 1%, 5% and 10%.

Dependent variable: MTB ratio	(1) OLS	(2) I.V.	(3) Low C&B OLS	(4) Low Proportionality OLS
Leverage$_{t-1}$	-0.077	-0.106	-0.125	-0295
	(0.179)	(0.169)	(0.191)	(0.268)
EBIT-to-Total Assets$_{t-1}$	0.029	-0.179	0.337	0.991
	(0.468)	(0.555)	(0.392)	(1.013)
Log of real total assets$_{t-1}$	-0.204**	-0.213*	-0.119**	-0.088**
	(0.105)	(0.112)	(0.058)	(0.044)
Investor Protection$_t$	0.054	0.021	0.010	0.015
	(0.044)	(0.050)	(0.033)	(0.056)
GDP Growth$_t$	0.066	0.109**	0.010	0.031
	(0.044)	(0.049)	(0.032)	(0.068)
IRA$_{t-1}$	0.075	-0.552	-0.114	0.059
	(0.114)	(0.433)	(0.129)	(0.131)
Government UCR$_{t-1}$	-0.281	-1.993	-0.334*	-0.295
	(0.213)	(1.906)	(0.206)	(0.345)
Government UCR$_{t-1}$ * IRA	0.271*	1.924*	0.673***	0.671*
	(0.162)	(1.146)	(0.198)	(0.388)
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
R squared	0.307	-	0.278	0.394
F Test (*p value*)	0.000	0.000	0.000	0.000
Hansen J (all instruments) (*p value*)	-	0.560	-	-
Diff-in-Sargan: Prop. Index (*p value*)	-	0.247	-	-
N. Firms [N. Obs.]	45 [341]	45 [324]	38 [245]	26 [163]

Table 9 – Market value, IRA and government UCR at 30% threshold

Sample of energy and telecom regulated firms. The dependent variable is the Market-to-Book ratio defined as (Total Assets - Book Value of Equity + Market Value of Equity)/Total Assets). The explanatory variables are defined similarly to Table 4. *UCR30%* is a dummy equal to 1 when the government controls 30% or more of the firm's UCR and is equal to 0 otherwise. The Hansen J statistic tests the null of the validity of all instruments, the C statistics is the difference-in-Sargan test that suspect regressors or instruments are exogenous. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. ***, **, * denote significance at 1%, 5% and 10%.

Dependent variable: MTB ratio	(1) OLS	(2) IV	(3) Low C&B OLS	(4) Low proportionality OLS
Leverage$_{t-1}$	-0.199	-0.219*	-0.223	-0.323**
	(0.130)	*(0.129)*	*(0.143)*	*(0.144)*
EBIT-to-Total Assets$_{t-1}$	0.190	0.166	0.188	0.146
	(0.127)	*(0.100)*	*(0.134)*	*(0.143)*
Log of real total assets$_{t-1}$	-0.240***	-0.216***	-0.207**	-0.232**
	(0.091)	*(0.059)*	*(0.088)*	*(0.100)*
Investor Protection$_t$	0.005	-0.050	-0.026	-0.034
	(0.039)	*(0.060)*	*(0.041)*	*(0.047)*
GDP Growth$_t$	0.045	0.099*	-0.011	-0.005
	(0.041)	*(0.051)*	*(0.032)*	*(0.061)*
IRA$_{t-1}$	0.006	-0.885*	-0.081	0.014
	(0.111)	*(0.519)*	*(0.157)*	*(0.123)*
UCR 30%$_{t-1}$	-0.087	-1.321	-0.152	-0.202
	(0.117)	*(1.047)*	*(0.189)*	*(0.149)*
UCR 30%$_{t-1}$ * IRA	0.046	1.633**	0.360**	0.421***
	(0.136)	*(0.810)*	*(0.166)*	*(0.160)*
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
R squared	0. 309	-	0.311	0.364
F Test (*p value*)	0.000	0.000	0.000	0.000
Hansen J (all instruments) (*p value*)	-	0.437	-	-
Diff-in-Sargan: Prop. Index (*p value*)	-	0.301	-	-
N. Firms [N. Obs.]	57 [449]	57 [424]	50 [353]	38 [271]

Appendix - Market value and ownership: the role of political institutions
Full sample

The dependent variable is the Market-to-Book ratio defined as (Total Assets - Book Value of Equity + Market Value of Equity)/Total Assets. The explanatory variables are defined similarly to Table 4. C&B is the *Checks & Balances*, a time-varying index, ranging from 0 to 7, that measures the number of veto powers in the political system according to specific legislative and executive indexes of electoral competitiveness (World Bank Database on Political Institutions). Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. ***, **, * denote significance at 1%, 5% and 10%.

Dependent variable: MTB ratio	*Checks and Balances*		*Degree of Electoral Proportionality*	
	(1)	(2)	(3)	(4)
			Low proportionality	*High proportionality*
	Low C&B	*High C&B*		
Leverage$_{t-1}$	-0.071	-0.228	-0.145	0.195
	(0.111)	(0.193)	(0.109)	(0.222)
EBIT-to-Total Assets$_{t-1}$	0.215	-0.988	0.210	-0.932
	(0.142)	(0.675)	(0.164)	(0.471)
Log of real total assets$_{t-1}$	-0.158**	-0.077	-0.177**	-0.381**
	(0.080)	(0.185)	(0.085)	(0.169)
Investor Protection$_t$	0.037	0.078	0.033	0.286**
	(0.036)	(0.142)	(0.040)	(0.134)
GDP Growth$_t$	0.043	0.159	0.062	0.077
	(0.027)	(0.116)	(0.044)	(0.072)
Government UCR$_{t-1}$	-0.364***	-0.502	-0.419**	-0.542
	(0.134)	(0.464)	(0.161)	(0.359)
IRA$_{t-1}$	-0.142	0.253	-0.087	-0.010
	(0.097)	(0.378)	(0.079)	(0.242)
Government UCR$_{t-1}$ * IRA	0.767***	-0.005	1.011***	0.307
	(0.203)	(0.638)	(0.208)	(0.339)
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
R squared	0.257	0.369	0.290	0.426
F Test (*p value*)	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	80 [571]	27 [121]	66 [482]	31 [213]

Additional Table - For the Referees only

Robustness: Market value, ownership and competition effects

The dependent variable is the *Market-to-Book ratio* defined as (Total Assets - Book Value of Equity + Market Value of Equity)/Total Assets). The explanatory variables are defined similarly to Table 4. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. ***, **, * denote significance at 1%, 5% and 10%.

Dependent variable: MTB ratio	(1) Low Competition Sub-sample	(2) Low Competition Full sample .	(3) Direct effect Sub-sample	(4) Direct effect Full sample
Leverage$_{t-1}$	-0.096	0.002	-0.248*	-0.219*
	(0.177)	(0.109)	(0.141)	(0.127)
EBIT-to-Total Assets$_{t-1}$	0.596	0.533	0.183	0.127
	(0.408)	(0.395)	(0.118)	(0.097)
Log of real total assets$_{t-1}$	-0.315**	-0.218**	-0.223***	-0.149**
	(0.137)	(0.097)	(0.070)	(0.077)
Investor Protection$_t$	0.034	0.070*	-0.064	0.008
	(0.047)	(0.037)	(0.060)	(0.096)
GDP Growth$_t$	0.041	0.086**	0.093**	0.094**
	(0.046)	(0.038)	(0.045)	(0.047)
IRA$_{t-1}$	-0.045	-0.065	-1.289**	-1.063*
	(0.115)	(0.103)	(0.651)	(0.628)
Government UCR$_{t-1}$	-0.281	-0.295**	-3.180	-0.240
	(0.255)	(0.143)	(2.051)	(1.687)
Government UCR$_{t-1}$ * IRA	0.191	0.279	3.284***	2.434**
	(0.191)	(0.229)	(1.209)	(1.109)
OECD Index of Liberalization $_{t-1}$	-	-	*0.032*	*-0.024*
	-	-	*(0.053)*	*(0.044)*
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
F Test (*p value*)	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	45 [317]	76 [560]	57 [424]	64 [473]