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Reluctant regulation ☆

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ABSTRACT

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We study the effect of state ownership on the market-to-book ratios of publicly traded European utilities from 1994 to 2005. We find that when the company is subject to independent regulation, state ownership seems positively associated with firm value. This relation tends to appear in countries where weak checks and balances and political fragmentation do not constrain the power of the executive. Our results suggest that, where political institutions are weak, politicians may influence regulatory agencies in order to benefit state-owned firms. *Journal of Comparative Economics* **41** (3) (2013) 804–828. Universita' di Torino, Dipartimento di scienze economico-sociali e matematico-statistiche, C.so Unione Sovietica 218/bis, 10134 Torino, Italy; Universita' Bocconi, Paolo Baffi Centre, Via G. Roentgen 1, 20136 Milano, Italy; Politecnico di Torino, DIGEP, Corso Duca degli Abruzzi 24, 10129 Torino, Italy.

"How can the state regulate the firms it also runs?"
The Economist (22-01-2012, p. 17)

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, the divestiture of state assets has slowed down in most developed economies and somehow progressed in emerging countries due to the floating of large State-owned Enterprises (SOEs). However, the most common outcome of this worldwide process is the persisting 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, not full, privatization

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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).

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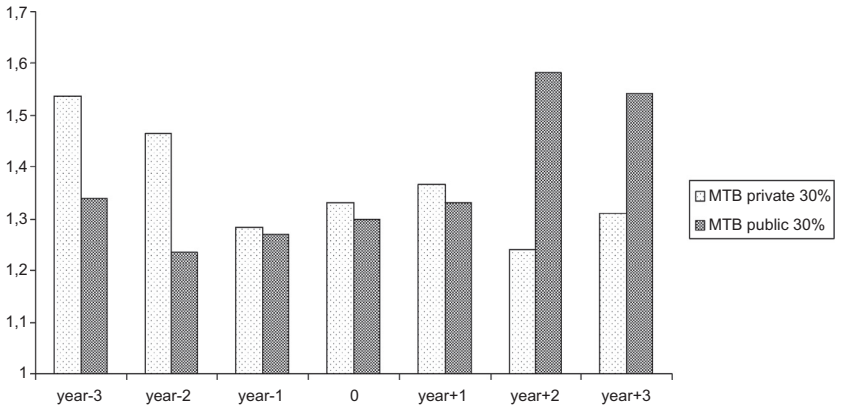

Fig. 1. Market-to-book ratios at the IRA inception, before and after the event. (Sample: firms undergoing the change in regulatory regime; ownership threshold at 30%.)

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, transportation, and water, had a great bearing in past privatizations. 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 agencies to which governments were to delegate regulatory policy. Yet, government control of privatized/regulated firms is commonly observed also in public utilities.[3]

We observe that residual ownership by the government does not affect negatively the market value of regulated utilities: higher state ownership is associated to higher firm value, but this happens only when the firm becomes subject to an IRA. Fig. 1 illustrates the evolution of market-to-book ratios of European telecoms and energy utilities before and after the official establishment of respective IRAs. We notice that, on average, in the 3-year period after the event, state-controlled firms outperform privately controlled firms by 15 percent.

The aim of this paper is twofold: first, we investigate 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 the value of firms regulated by IRAs. To this purpose, we use an original panel of 88 European publicly traded network utilities 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). Our estimates rely on cross- and intra-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", since their interference may lead to time-inconsistent regulatory decisions and to the expropriation of utilities' sunk investments (Stigler, 1971). These arguments typically 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 actual 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 whereby regulatory powers are delegated to a formally independent regulator, but *de facto* subject to political interference by the government.

Reluctant regulation matters when the government retains significant ownership rights in regulated firms. In this case, politicians may wield their powers to obtain favorable regulatory decisions that boost utilities' profitability, and this in turn allows the government, for example, to raise additional fiscal revenues via extra-dividends and to avoid tax increases,

[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% of privatized utilities are under government control (Roland, 2008).

[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 and 445).

spending cuts or other politically costly decisions or to promote "national champions". The expectation that the government will give 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.

To establish the link between residual state ownership and regulated firms' market value, we investigate the circumstances that make government interference and reluctant regulation possible, exploiting the heterogeneity in ownership patterns and in 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 discretionary executive power are weak. In this case, political power can overturn administrative decisions and undermine the credibility of regulatory commitments. Formal institutional arrangements that affect discretionary executive power typically include the explicit separation of powers, i.e. an effective system of "checks and balances" between different branches of government, and an electoral system that fosters party proliferation and political fragmentation. We thus predict reluctant regulation to surface where weak institutional constraints provide the executive with incentives to retain higher stakes in regulated firms. Where, instead, the country's institutional endowment fosters genuinely independent regulation, residual public ownership should not affect firm value.[6]

Our empirical results show that residual state ownership positively affects the market value of firms regulated by IRAs and suggest that this effect materializes where political institutions are not particularly effective in restraining government power. In the instrumental variable model, where we account for the possible endogeneity of residual state ownership and independent regulation, we find that state ownership appears as an important channel through which political institutions indirectly affect the market valuation of regulated firms. Results continue to hold when we control for sector characteristics, country specificity, different thresholds of state ownership, cultural aspects such as trust in society, and alternative measures of institutional constraints on discretionary executive power, thus supporting the view that reluctant regulation is a fundamental driver of the performance of public utilities.

A few papers have addressed related issues, showing that political institutions are significant determinants of structural reforms such as regulatory decisions (Duso, 2005; Guerriero, 2011; Hauge et al., 2012), market liberalization (Pitlik, 2007; Potrafke, 2010; Duso and Seldeslachts, 2010) and privatization (Li and Xu, 2002; Bortolotti and Faccio, 2009; Bjørnskov and Potrafke, 2011; Dinc and Gupta, 2011).[7]

More specifically, Edwards and Waverman (2006) and Bortolotti et al. (2011; BCRS hereafter) have addressed the interactions between state ownership and regulatory independence. Edwards and Waverman (2006), using a sample of 15 EU incumbent telecom operators tracked from 1997 to 2003, show that public ownership positively affects wholesale rates, suggesting that governments influence regulatory outcomes to favor incumbents in which they hold an ownership stake. However, this effect is mitigated in presence of institutional features enhancing regulatory independence from the government. BCRS (2011), using a panel of EU utilities, analyze how firm ownership and regulatory independence affect capital structure and regulated prices. They find that privately-controlled firms are more highly leveraged than state-controlled firms if they are regulated by an IRA and that the leverage of private firms has a positive and significant effect on regulated prices. While these results are consistent with the theory that private regulated firms use leverage strategically to obtain better regulatory outcomes (Spiegel and Spulber, 1994), they also suggest that state-controlled companies do not have to rely on such strategic device.

The current paper draws on the same panel of firms, but departs from the analysis developed in BCRS and complements it in several respects. First, while BCRS primarily aimed to test the strategic role of leverage to soften ex post regulatory opportunism, this paper investigates whether the quality of political institutions ultimately affects firm value via the imperfect delegation of regulatory powers to IRA and partial privatization (i.e. reluctant regulation), fundamental aspects of structural reforms in the European Union. Second, in this paper we use a continuous ownership variable that measure governments' ultimate control rights (Bortolotti and Faccio, 2009) while in BCRS we use a dummy variable to define the ownership status. Third, differently from BRCS, the econometric analysis explicitly accounts for the potential endogeneity of institutional reforms.

To our knowledge, our paper is the first empirical analysis on the impact of state ownership on regulated firms' market value in the EU introducing political institutions and the concept of *reluctant regulation* to explain this 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 estimation strategy. In Section 4, we describe our data, specifically the nature of the sample, 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 settings. In Section 7, we present the sensitivity analysis. Section 8 contains our conclusions.

[6] Our approach follows a political economy explanation of regulation *and* privatization. Under an alternative view, the regulator might be less willing to expropriate ex post the regulated firm simply because he assigns a greater weight to firm profits than to consumer surplus either to promote investment (Guerriero, 2011) or because political divergence between politicians and regulators (Strausz, 2011). Firm value would thus increase not due to reluctant regulation but rather due to the regulator's pro-firm attitude. However, in this alternative view, all firms, irrespective of their ownership, would benefit from such regulatory policies, and therefore ownership should not matter at all.

[7] 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.

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 have long dominated European network industries. Under such regime, utilities were an operational branch of the government and instructed to provide universal services at low prices, absorb excess unemployment, and invest in infrastructure. In turn, the government played the dual role of owner and "regulator", by setting 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 1980s in the UK, and early 1990s in the rest of Europe, the European Commission promoted gradual liberalization and a regulatory process intended to improve the efficiency and service quality of European public utilities, as well as increase their levels of investment. In particular, the European Commission enacted a number of directives aimed at setting up a common regulatory framework for all EU member states, which were in turn required to embody such directives into national legislation.

The most important of these EU-driven reforms may have been the institution of IRAs, charged with the duty to regulate the activity of network industries and tame the potential conflict of interest between government and state-controlled utilities. Typically, delegated regulatory tasks involve price-setting decisions both at retail and wholesale levels – 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 specifications to use or access existing infrastructures.

The IRAs ought to operate with their own specialized staff and according to a detailed mandate, independently of ministries or other governmental departments. The European Commission especially urged governments of member states to establish national independent regulators at least in crucial sectors like energy and telecommunications, sometimes under the threat of opening infringement procedures before the European Court of Justice.[8] Nevertheless, the European Commission left the decision about the definition and the scope of the delegated powers 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 depended on how this delegation process was implemented in each member state. Indeed, agencies are usually not fully independent because national executives often retain ultimate responsibility for their activities (Verhoest et al., 2012).

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

The implementation of these institutional reforms (modern regulation, privatization, market liberalization) varies considerably across EU countries and industries. 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 do not yet exist (so regulation is carried out by government committees or within ministries) and privatization is 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 frameworks and the inception of IRAs.

Implementation of reforms is well 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 UK the IRA was established in 1984, while in the other EU countries IRAs were set up in the mid-90s. As for corporate ownership, at the onset of the liberalization process the European Commission raised concerns about residual state ownership in telecoms companies.[9] By 2005, most telecom companies were (at least partially) privatized, and governments held control stakes only in the case of 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 market, followed by Directive 98/30 for the gas market; these directives aimed at gradually introducing competition in power 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 UK was again the first country in Europe to establish an IRA in 1989, while other countries followed from 1995 to 2000, with Germany being the last one to set up an IRA for energy utilities in

[8] 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).

[9] "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, p. 15). More recently, an OECD report still remarks: "with public enterprises often enjoying soft budget constraints and state guarantees, the playing field is not level in markets where they operate" (Conway and Nicoletti, 2006, p. 6).

Table 1
Timing of regulation and privatization in the energy and telecommunications sectors in European countries.

Country	Energy (electricity and 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

2006. As regards ownership, the only fully privatized energy utilities are British. At the opposite side stands the French government, which, with its more 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 its hold 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 UK, 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 political rents from over-investment and excess-employment programs that typically result in low profitability and inefficiency (see for example Megginson and Netter, 2001). In this case, private investors will typically shun state-controlled regulated firms.

The establishment of IRAs – such as the process promoted by the European Commission during the 1990s – functionally separates the (dual) role of the state as typical large shareholder of utilities and as regulator of the industry. The delegation act shifts the regulatory powers from the political sphere to an independent bureaucratic entity, curbing *ex ante* political interference and opportunistic behavior by self-interested politicians (Levy and Spiller, 1994; Armstrong and Sappington, 2007). In sum, credible regulation boils down to restraining the power of the executive to expropriating the utilities' investment (see the survey by Spiller (2004)).

In theory, if regulators were *de facto* independent, they should be able to thwart interference by politicians, regardless of the private or public ownership of the firm (Laffont and Tirole, 1986; Sappington and Stiglitz, 1987). When regulators are *de iure* but not *de facto* independent, politicians still wield regulatory powers and influence regulatory decision (Armstrong and Sappington, 2006) providing them with the incentives to retain stakes in the regulated firms. By keeping regulators on their toes, politicians can obtain favorable treatment of state controlled utilities (i.e. higher tariffs, higher entry barriers, delaying the unbundling of the network, softer budget constraints etc.) that eventually enables them to extract economic or financial rents, such as dividends to be used to finance the budget deficit.[10] Thanks to the indirect protection against the risk of expropriation of a utility's sunk investment, private investors in the equity market will positively value the presence of the state as shareholder (Perotti, 1995), as they expect to share the benefits of a soft regulatory stance with the government.[11] This

[11] Empirical evidence confirms the government "helping hand" even in recent years. Glowicka (2006) finds that distressed EU state controlled firms are more likely to receive long-term government aids than privately controlled companies. Borisova et al. (2011) find that investors view government ownership as an implicit assurance of repayment and protection against bankruptcy. Finally, Borisova and Megginson (2011) comparing corporate bonds of fully and partially privatized firms, show that a one-percentage-point increase in domestic government ownership is associated with lower credit spreads – used as a proxy for the cost of debt – of roughly three-quarters of a basis point.

"corporatist" equilibrium is likely to exist when regulatory powers are imperfectly delegated to formally, but not genuinely independent IRAs, i.e. in the regime that we label as *reluctant regulation*.[12]

Following this argument, the relevant research question becomes: under what conditions has state ownership a positive impact on firm value? Our working hypothesis is that *reluctant regulation* is more likely to appear where political institution constraints are not binding and the administrative discretionality of regulators is jeopardized. More generally, we argue that this will occur where the institutional countervailing powers are weak and where the political system provides governments with more latitude to intervene on administrative decisions, such as those taken by independent authorities or agencies.[13] To test this hypothesis, we have looked for proxies that describe the extent to which executive power is constrained by formal institutional arrangements, and we predict that in those countries where such constraints are in place, regulators are less likely to be subject to political interference and state ownership does not positively affect firm value.

The recent political economy literature has developed a vast array of variables capturing the formal institutional arrangements that curb executive discretionary executive power or make policy reversals less likely (see, among others, Acemoglu, 2005; Persson and Tabellini, 1999; Persson, 2002). With reference to regulated network industries, Levy and Spiller (1994) emphasize that the credibility of regulatory policy depends on the structure and organization of political institutions, so that political interference with regulation can be staved off by an effective system of "checks and balances". Spiller and Urbiztondo (1994) show that in systems characterized by divided governments, regulatory agencies are more likely to be independent, thus suggesting that variables describing the electoral system are also appropriate. In this view, majority rule systems, characterized by stronger (unified) governments, are more likely to expose regulatory authorities to the risk of interference and unexpected policy changes. In contrast, proportional electoral systems that lead to party proliferation and political fragmentation are thought to hinder the decision-making process, making policy changes less likely, and this would, in turn, enhance the independence of regulators.

Alternative explanations could be set forth to explain why market value should be higher at state-controlled firms, such as that they are for some reason more efficient or better managed than privately-controlled firms. For example, Laffont and Tirole (1991) show that within state owned ("public") firms, managers whose objectives are more aligned with those of the government- regulator better internalize investment incentives. In this scenario, state owned firms' managers would exert higher effort in cost reduction with respect to private firms' who "respond to two masters – the regulator and the shareholders" (p. 85) and have their incentives diluted. On the other hand, managers in public enterprises might be forced to redeploy their investment to serve social goals, which also leads to ex post expropriation and dilutes investment incentives. In sum, Laffont and Tirole (1991) conclude: "these two insights have ambiguous implications for the relative cost efficiency of the public and private sectors; theory alone is thus unlikely to be conclusive in this respect" (p. 103). All in all, the view that state-controlled firms may be more efficient than privately controlled firms is quite controversial, let alone not supported by the empirical evidence (see, among the others, Megginson and Netter, 2001). To cite a few influential articles, Kornai et al. (2003) show that public enterprises have *less* incentives to minimize production costs, Hart et al. (1997) conclude that they are generally *less* cost efficient than private companies, for example due to excessive use of the labor input (as in Pint (1991) and Shleifer and Vishny (1994)). Back to our paper, should state-controlled utilities have higher market to book ratios because they are more efficient, there should be no difference between their market value under strong or weak political institutions (in other words, political institutions should not matter at all).

3.2. Empirical modeling

The theoretical framework developed in the previous section provides the hypotheses to be tested by our econometric analysis. We focus on the empirical relation between firm market value (as measured by the market-to-book ratio) and ultimate control rights held by the government in the presence of IRAs (as measured by a dummy variable) *vis-à-vis* executive-branch regulators or ministries.

Estimation of this relationship raises a number of econometric issues: reverse causality, measurement errors, omitted variables, and specification of the functional form. First, government's residual ownership is likely to be endogenous because expectations on payouts and investment opportunities affect privatization decisions. Second, a reverse causality problem may 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. Third, the IRA dummy is an imperfect measure of regulatory independence, since it only denotes the presence of a regulatory authority and not the degree of its independence. Fourth, as we deal with a heterogeneous pool of utilities that operate in various sectors and countries, we have to include firm-, country- and industry-specific controls, next to the usual firm- and time-fixed effects, in order to account for relevant factors that make policy variables potentially

[12] 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.

[13] The important role of legal and political institutions for regulatory commitment and decisions is also examined by Armstrong and Sappington (2006) who argue: "When legal institutions are weak, pressure groups may anticipate substantial benefits from convincing the regulator to renege on the promises he has made to the firm" (p. 339). In contrast, "Strong legal institutions can thwart attempts by other government agencies to intervene in the day-to-day operations of the regulatory agency and can thereby enhance a regulator's commitment powers by reducing the likelihood that the terms of announced regulatory policies will be changed" (p. 338). Similarly, according to Alesina and Tabellini (2008) bureaucrats/regulators "perform well [...] if the legal system is strong" (p. 444).

endogenous. Fifth, as long as reluctant regulation is expected to matter only when the government retains sizeable ownership stakes in regulated firms, a linear specification is incorrect and we must also include the interaction between the ownership variable and the IRA dummy, as well as to treat the resulting term as potentially endogenous.

The empirical strategy we employ to estimate the impact of residual state ownership on regulated firms' market value is the following: we begin with OLS (fixed-effect) regressions, where we enter the ownership variable both linearly and interactively with the IRA dummy. We then investigate whether the estimated coefficient of the interaction between state ownership and IRA differs across sub-samples characterized by institutional arrangements with differential ability to constrain government and politicians' discretionality. To control for cross-sector heterogeneity, we estimate the model both for the full sample and a sub-sample of energy and telecom firms. Moreover, given the quite complex nature of the dataset – each observation is one particular firm, in one particular industry, in one particular year – and of the correlation structure of the error term, we report standard errors' estimates that are robust to heteroschedasticity and to within-group serial correlation, clustering observations at the firm- and at the industry-level. Finally, we try to establish through which channel government shareholding affects firm value with an identification strategy that uses specific political–institutional variables as instruments for state ownership, regulation and their interaction.

3.3. Identification and instrumental variables

Under a regime of reluctant regulation, the power of governments to interfere with regulatory policy produces economic rents that boost the market value of partially privatized firms. The credibility of regulatory commitment therefore hinges upon the ability of the political system to protect regulatory independence.

Our identification strategy is based on the assumption that political institutions affect both the extent of governments' residual regulatory powers and the size of the stake retained in public utilities.

To find suitable instruments, we rely on political economy variables identified by the literature as potentially relevant for the credibility of regulatory commitments. Therefore, to account for the number of decision-makers whose agreement is needed to revise policies and reforms, our first political economy instrument is *Checks & Balances*, a time-varying index, available in the World Bank DPI-Database on Political Institutions, that ranges from 0 to 7 (from low to high checks and balances). The index is a measure of the number of veto players in a political system adjusted for the respective independence of veto players in "divided" government, in presidential systems, or minority or coalition governments in proportional systems (Beck et al., 2001, pp. 169–170).[14]

The second political variable accounts for the electoral rules, whether they lead to party proliferation or aggregation within the Parliamentary system (Lijphart, 1999). As shown by Levy and Spiller (1994) and Henitsz and Zelner (2001), in highly fragmented political systems and divided governments, policies and reforms are less likely to be revoked due to a large number of institutional actors with potential veto power. In this case, politicians are less likely to interfere with regulatory decisions, and regulators should be – at least in principle – more independent (see also Spiller and Urbiztondo, 1994). In contrast, unified and cohesive governments that are the typical outcome of majority rule electoral systems are thought to have more room to interfere with regulatory decisions. We use the electoral *Disproportionality Index (G)* 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 i 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 equals zero when there is perfect proportionality between seats and votes and it increases, on average, as the electoral system moves towards majority rule. By positioning country-years in a political spectrum that ranges from majority rule to the so-called "consensus" model of democracy (Spolaore, 2004), the index provides a measure of political fragmentation. Lower electoral disproportionality is usually associated with a higher number of parties in the legislature as well as in the government, and more stable governments (Lijphart, 1999).

The set of instruments includes three additional political economy variables that may help explaining the pace of privatization and regulatory reforms. The *Political Orientation Index* measures governments' 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 governments is a significant determinant of structural market reforms. The index ranges from 0 (extreme left wing) to 10 (extreme right wing) and varies over time. It is the weighted average of the right-left political orientation scores of the parties forming the executive branch of government, where the weights are 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)). *Government Stability* is a time-varying survey-based measure that captures the extent of turnover of a government's key decision makers in any year. It ranges from 0 (low stability) to 1 (high stability). *Election date* is a dummy equal to 1 if there is a general election in that year. It is included to see whether the institution of the IRA was motivated by an electoral, and thus a political, change. *Government Stability* and *Election Date* are both

[14] This measure has been widely used in the literature (see, among the others, Keefer and Knack, 2007).

available in the World Bank Database of Political Institutions and thoroughly described by Beck et al. (2001). Because a large set of instruments is available, we estimate an over-identified model and, 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 et al., 2007; Tabellini, 2010), we can tentatively isolate the channel through which political institutions affect market value.

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 its ministries, government committees, local governments or by a formally established IRA. Many of these utilities, while being publicly traded on a stock exchange, are partially owned by the government. The regulated sectors include electric and natural gas utilities (distribution and transmission), water supply companies, fixed-line telecoms, freight road concessionaires, and transport infrastructure operators such as ports and airport authorities.

The data comprise a diversified set of firms operating in a wide array of industries that either have always been under the supervision of an IRA (such as UK energy, telecom and water companies), or have never been subject to an IRA (freight roads concessionaries, ports and docks, airports and water companies in all Europe except for the UK), or that become regulated by an IRA during the sample period. Although in the empirical analysis we control heterogeneity by including firm fixed effects, one might worry that the different institutional and regulatory environment faced by firms (independent authorities, national ministries, local governments or some executive branch committee) might somehow bias our results. To address this concern, we conduct the econometric analysis both on the complete, but more heterogeneous sample, as well as on the more homogeneous (i.e. subject to IRAs and to similar EU-prompted market reforms) sub-sample of energy (electricity and gas) utilities and telecom companies. 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 0 otherwise (i.e. when it is regulated by an executive-branch committee). 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 UK introduced an IRA in 1984 for the telecom industry and in 1989 for the energy sector, while most countries established IRAs as late as in the mid-1990s (from 1995 to 2000). We have complemented this data with additional information about the presence of IRAs in the other sectors drawn from other sources. We have found that only the water industry in the UK has an independent regulatory agency. Overall, 60 firms (57 energy and telecom operators plus three UK water supply companies) are subject to an IRA while 28 are regulated by a government committee or ministry.

For all firms, we identify and track ultimate control rights (UCR) held by the state over time, following the weakest link approach.[15] 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, UCRs are added up across all chains. As Fig. 2 shows, privatized utilities often display complex ownership structures, with pyramiding often used to separate share ownership and control.

Government UCR is the continuous, time-varying variable that we use to measure state ownership in the econometric analysis. Many firms in our sample were partially privatized over the period, in the sense that governments gradually sold shares over time, but retained significant stakes in such firms. Only 19 firms (16 UK companies) have fallen 100% under private control in the period considered,[16] while in 69 firms (out of a total of 88) ultimate control rights by the state have changed over time.

To throw more light on ownership effects in our sample, we have constructed a dichotomous variable *UCR_30%* for each firm-year observation, taking the value of *UCR_30%* = 1 when the state's ultimate control rights are equal to or above 30%, and 0 otherwise. Using the dummy *UCR_30%* to classify ownership status, we observe that 42 of the 88 firms are privately-controlled (i.e. with a value of government *UCR* of less than *30%*) throughout the period, 26 are state-controlled, and 20 were "privatized" – i.e. UCR has fallen below 30% over the time-period.

In Table 2, for the ten largest telecom and energy utilities, we report the date of the IPO, the year since when they have been operating under an IRA, overall market capitalization, and *Government UCR* as of 2005. Notably, IRAs in energy industry were introduced later than in telecommunications, mostly around 2000. The privatization process has progressed unevenly across countries: it lags behind in France and Germany, but it is more advanced in Spain and the UK where most of the firms sampled have been under private control during the period under consideration. More in detail, we note that 4 out of 14 fixed-line 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, 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

[15] The "weakest link" is widely used in the literature to measure control rights. See La Porta et al. (1999), Claessens et al. (2000), Faccio and Lang (2002), and Bortolotti and Faccio (2009).

[16] To account for the peculiarity of the UK firms' sample, we re-estimate our preferred specifications after excluding UK companies from the analysis (see Section 7 and Table 10).

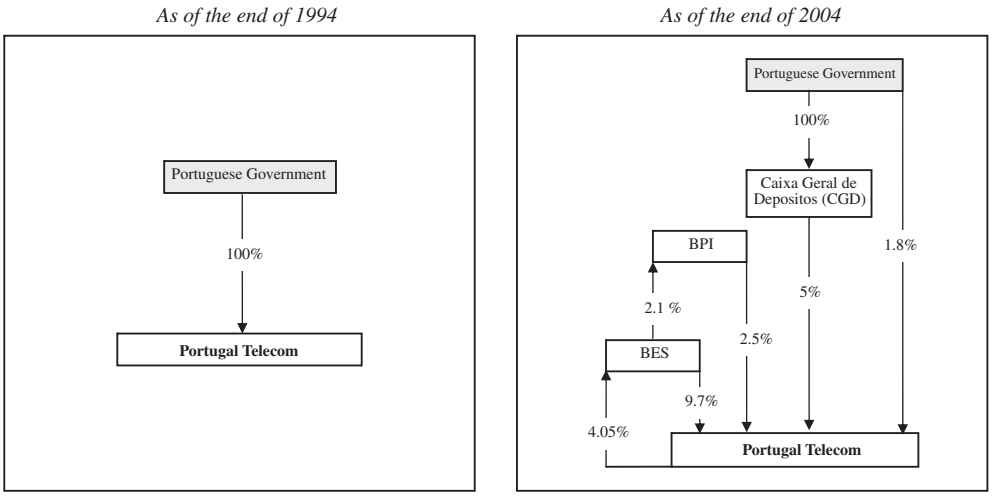

Fig. 2. The evolution of the government control rights in EU utilities: the case of Telecom Portugal.

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 the book leverage, defined as total financial debt divided by the sum of book equity and total financial debt.[17]

To control for industry-specific factors that may influence firm value through changes in market structure and in competitive pressures within public utility sectors, we have included the *OECD Index of Liberalization*, a time-varying measure obtained from the OECD International Regulation database by Conway and Nicoletti (2006). The index is an average of several indicators, such as entry barriers, vertical integration and other features of the industry structure, and ranges from 0 to 6 (larger numbers indicate a lower degree of openness). Because the original index includes a sub-indicator for state ownership of the relevant firms in each industry, to avoid collinearity with our own measure of government ownership (*Government UCR*), we excluded this component and recomputed the average for the remaining OECD sub-indicators. The time-varying nature of the index reflects the changing conditions of the utility services' provision, such as the degree of market opening in different sectors. In turn, this can help capturing potential differences in demand elasticity across sectors as long as competitive conditions change over time.

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 et al. (1999) and updated by Pagano and Volpin (2005) as 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 higher values of this index to be associated with lower cost of equity and hence higher market value (see, for example, La Porta et al., 2002). *Debt to GDP* is the ratio of total (domestic and foreign) government debt 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 a given country's fiscal conditions. Finally, we include *GDP Growth* to account for country specific differences in macroeconomic conditions over time. Table 3 summarizes the descriptive statistics for the variables used in the analysis both for the full sample (Panel A) and for the sub-sample of energy and telecom companies (Panel B).

Fig. 1 shows the average market-to-book ratios for private and state controlled firms from 3 years before the IRA was set up to 3 years after the IRA establishment, using 57 energy and telecom firms. If we define companies as state-controlled when *Government UCR* is equal to or greater than 30%, we notice that average market-to-book ratio of state controlled firms is lower before the switch (year 0), but starts growing thereafter, so that in the second and third year after the IRA was established, 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:

[17] 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.

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	UK	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	UK	1989	1986	35.03	0.000
Gaz de France	France	2000	2005	28.80	0.801
National Grid Transo PLC	UK	1989	1995	28.67	0.000
Iberdola	Spain	1998	1992	24.60	0.020

$$MTB_{it} = \alpha_0 + \alpha_1 GovernmentUCR_{i,t-1} + \alpha_2 IRA_{i,t-1} + \alpha_3 GovernmentUCR_{i,t-1} * IRA_{i,t-1} + \alpha_4 \boldsymbol{X}_{i,t-1} + \alpha_5 \boldsymbol{Y}_{i,t} + \mu_i + \lambda_t + \varepsilon_{it}, \quad (1)$$

where MTB_{it} is the *Market-to-Book* ratio of firm i in year t, $GovernmentUCR_{i,t-1}$ is the 1-year lag of the continuous government ultimate control rights variable, $IRA_{i,t-1}$ is the 1 year lag 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,[18] $\boldsymbol{X}_{it-1}$ is a vector of firm-specific variables, $\boldsymbol{Y}_{it}$ is a vector of industry- and 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*, the *EBIT-to-Total Assets* ratio, and the firm's financial *Leverage*.[19] The vector of industry and country controls includes the sectoral *OECD Index of Market Liberalization*, the *Investor Protection* index, the *Debt to GDP* ratio and *GDP growth*. To reduce at least partly possible reverse causality, we lag all firm variables 1 year and we add firm-specific fixed effects to filter out unobserved firm heterogeneity that is constant over time (in Section 6.2 we present the instrumental variable results).

In Table 4, we present the OLS fixed-effect coefficients for the full sample of EU regulated utilities (Columns (1) and (2)) and for the sub-sample of 57 regulated energy and telecom firms which, following the EC directives, implemented the new regulatory regime at some point in time – mostly from 1996 to 2000 (Columns (3) and (4)). We report robust standard errors that are clustered at the firm and industry level in round and square brackets respectively.

Results show that market-to-book is negatively correlated with firm size and *Debt to GDP* ratio and that, for the full sample, market value is larger when profitability is higher, investor rights are better protected by the law and GDP grows faster. In Columns (3) and (4), for the sub-sample of energy and telecom companies, the OECD Index of Liberalization does not enter with a significant coefficient. We do not include this variable for the full sample in Columns (1) and (2) because the index is not available for about one third of the firms, namely transportation infrastructure operators (ports and airports) and water supply companies and if we enter it, the estimating sample would be almost indistinguishable from the energy-telecom sub-sample. However, because the OECD Liberalization index allows us to control for potentially relevant sector specific omitted variables, we will include it in the remainder of the analysis, which focuses on energy and telecom companies.[20]

Turning to the variables of interest for this paper, we find that, in Column (1), neither state ownership nor the IRA dummy has, separately, a significant effect. When we add the interaction between *Government UCR* and *IRA* (Column (2)), we find that the coefficient on *Government UCR* is significantly negative, while its interaction with IRA is positive and highly significant. The positive coefficient on interacted terms suggests that when the IRA is in place, the larger the share held by the state, the higher the firm's 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 were subjected to an IRA from the start or never became subject to an IRA,

[18] A similar approach was used by Kwoka (2002, 2006) to investigate the differences between the prices charged by private and public US electric utilities and their cost efficiency.

[19] This specification is rather standard in the literature (see, for example, Morck et al., 1988; Lang et al., 1996).

[20] We thank one Referee for this suggestion.

Table 3
Summary statistics.

Variable	Mean	Std. Dev.	Min	Max	No. Obs.
Panel A: Full sample					
Market-to-Book	1.389	0.489	0.572	4.352	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
Distrust	0.348	0.099	0.100	0.665	765
Panel B: Sub sample of energy and telecom firms					
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
Distrust	0.351	0.100	0.100	0.665	493

which somehow reduces data heterogeneity. Notwithstanding this, in Column (3) the coefficient on *GovernmentUCR* is positive and significant and, in Column (4), when we estimate the effect of public ownership under an IRA, we find that the stand alone *GovernmentUCR* variable is no longer significant whereas the interaction term *GovernmentUCR* $*$ *IRA* is positive and significant (as it is in the full sample).

When we look at the total impact of state ownership on market value when the IRA is in place, as measured by $\alpha_1 + \alpha_3 *$ [IRA = 1], we find that the sum of coefficients is insignificant for the full sample in Column (2), but highly significant for the energy and telecom companies in Column (4) (p-values of the tests are reported at the bottom of all tables). This latter result is consistent with the descriptive evidence reported in Fig. 1, which shows a large increase in market value for partially state owned firms when they become subject to the IRA.

In the next section, we interpret this finding, analyzing its political economy implications.

6. State ownership and firm value: the role of political institutions

Our next step is to examine the drivers that explain the positive impact of residual state ownership on firm value when an IRA exists. In Section 3, we argued that the quality of a country's political institutions affects the propensity of governments to tamper with regulatory policy. To implement an empirical test, we first investigate whether the response of *MTB* ratios to different regulatory and ownership regimes differs across different political institutions as represented by two country-specific indices: *Checks and Balances* and *Disproportionality* (Section 6.1). We then address the endogeneity of *Government UCR*, *IRA* and of their interaction by incorporating the effect of political institutions straight into a specific identifying assumption, namely that *Checks and Balances* and *Disproportionality* are valid instruments in our regression model (Section 6.2). Finally, we present a first set of robustness checks to address the potential endogeneity of the *OECD Index of Liberalization* and to control for cultural aspects such as trust in society (Section 6.3).

6.1. Political institutions: evidence from sub-samples

In this Section, we focus on the sub-sample of 57 energy and telecom companies and report the corresponding results for the full sample in the Appendix A. We split the sample based on *Checks and Balances* (*C&B*) in Table 5, and *Disproportionality* in Table 6. These indexes allow for institutional changes over time, so that firms may shift from "high" to "low" categories.

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. The explanatory variables are defined in Section 4. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. Errors are clustered at firm (round parentheses) and sector (square parentheses) level.

Dependent variable: MTB ratio	Full sample		Telecoms and Energy sample	
	(1)	(2)	(3)	(4)
Leverage$_{t-1}$	−0.072	−0.062	0.096	0.092
	(0.106)	*(0.106)*	*(0.264)*	*(0.260)*
	[0.096]	*[0.096]*	*[0.214]*	*[0.206]*
EBIT-to-Total Assets$_{t-1}$	0.217	0.206	0.606	0.584
	(0.130)*	*(0.125)**	*(0.487)*	*(0.461)*
	[0.112]*	*[0.108]**	*[0.475]*	*[0.444]*
Log of real total assets$_{t-1}$	−0.201	−0.192	−0.323	−0.318
	(0.074)***	*(0.076)****	*(0.132)***	*(0.130)* **
	[0.072]***	*[0.075]****	*[0.125]****	*[0.123]****
Investor Protection$_{t}$	0.070	0.060	0.037	0.025
	(0.036)*	*(0.035)**	*(0.094)*	*(0.079)*
	[0.041]*	*[0.040]*	*[0.081]*	*[0.068]*
GDP Growth$_{t}$	0.078	0.085	0.001	0.020
	(0.035)**	*(0.034)***	*(0.046)*	*(0.044)*
	[0.035]**	*[0.035]**	*[0.050]*	*[0.047]*
Debt/GDP$_{t}$	−0.666	−0.723	−1.111	−1.203
	(0.391)*	*(0.378)**	*(0.647)**	*(0.671)* *
	[0.425]	*[0.409]**	*[0.714]*	*[0.743]*
OECD Index of Liberalization$_{t}$	–	–	−0.012	0.002
	–	–	*(0.057)*	*(0.054)*
	–	–	*[0.051]*	*[0.046]*
Government UCR$_{t-1}$ (α_1)	−0.114	−0.283	1.207	0.484
	(0.155)	*(0.131)***	*(0.671)**	*(0.433)*
	[0.145]	*[0.134]***	*[0.711]**	*[0.487]*
IRA$_{t-1}$ (α_2)	0.036	−0.067	0.163	−0.146
	(0.083)	*(0.098)*	*(0.124)*	*(0.122)*
	[0.082]	*[0.098]*	*[0.118]*	*[0.122]*
Government UCR$_{t-1}$ * IRA$_{t-1}$ (α_3)	–	0.404	–	1.035
	–	*(0.192)***	–	*(0.465)***
	–	*[0.223]**	–	*[0.459]***
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
$\alpha_1 + \alpha_3$	–	0.121	–	1.519
	–	*(0.226)*	–	*(0.764)***
p-Value test on $\alpha_1 + \alpha_3 = 0$	–	0.593	–	0.046
p-Value test on $\alpha_2 + \alpha_3 = 0$	–	0.028	–	0.027
R squared	0.261	0.269	0.195	0.207
F test (*p value*)	0.000	0.000	0.000	0.000
N. firms [N. Obs.]	88 [696]	88 [696]	57 [451]	57 [451]

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

To classify country-years observations with strong 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, we note that Denmark, Holland, Belgium and Germany exhibit the highest scores while Greece, Portugal, Spain and Italy the lowest. Fig. 3 reports the index trends for selected countries respectively at the top and bottom ends of the distributions, i.e. Denmark and Germany, Spain and Italy.

The empirical results in Table 5 are consistent with our predictions. In countries where institutional checks and balances are weaker, larger stakes of government ownership lead to higher *MTB* ratios. The coefficients on IRA and *GovernmentUCR* are insignificant in the linear specification in Column (1), but when we add the interactive term in Column (2), we find that *GovernmentUCR* enters with a negative sign, *GovernmentUCR* $*$ *IRA* with a positive sign and both are highly significant. The results strikingly differ when we turn to the sub-sample in which countervailing powers are supposed to keep the executive's discretion more in check (see Columns (3) and (4)). Here, the IRA dummy enters with a positive and significant coefficient, suggesting that where IRAs are expected to act independently (as per EC directives) capital markets attach a premium to the reduced regulatory uncertainty that follows from regulatory commitment (see Cambini and Rondi, 2011, for evidence on fixed investment). Moreover both *GovernmentUCR* and *GovernmentUCR* $*$ *IRA* are now negatively correlated with firm value,

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). *Checks & Balances* (C&B) is 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 explanatory variables are defined in Section 4. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. Errors are clustered at firm (round parentheses) and sector (square parentheses) level.

Dependent variable: MTB ratio	Checks and balances			
	(1) Low C&B	(2) Low C&B	(3) High C&B	(4) High C&B
Leverage$_{t-1}$	−0.150	−0.171	−0.217	−0.169
	(0.142)	*(0.141)*	*(0.213)*	*(0.243)*
	[0.130]	*[0.135]*	*[0.195]*	*[0.222]*
EBIT-to-Total Assets$_{t-1}$	0.253	0.237	−0.834	−1.209
	(0.147) *	*(0.131)* *	*(0.848)*	*(0.943)*
	*[0.101]***	*[0.083]****	*[0.808]*	*[0.904]*
Log of real total assets$_{t-1}$	−0.216	−0.229	−0.025	−0.090
	(0.089) **	*(0.085)* ***	*(0.187)*	*(0.165)*
	*[0.083]****	*[0.079]****	*[0.186]*	*[0.163]*
Investor Protection$_t$	0.046	0.033	−0.211	−0.171
	(0.055)	*(0.048)*	*(0.168)*	*(0.199)*
	[0.033]	*[0.029]*	*[0.187]*	*[0.221]*
GDP Growth$_t$	−0.029	−0.026	0.047	0.001
	(0.025)	*(0.023)*	*(0.074)*	*(0.069)*
	[0.025]	*[0.022]*	*[0.073]*	*[0.067]*
Debt/GDP$_t$	−1.197	−1.240	0.729	0.726
	(0.534) **	*(0.500)* **	*(1.767)*	*(1.576)*
	*[0.657]**	*[0.621]**	*[1.810]*	*[1.613]*
OECD Index of Liberalization$_t$	0.097	0.101	−0.238	−0.205
	(0.058) *	*(0.056)* *	*(0.055)* ***	*(0.068)* ***
	*[0.040]***	*[0.038]****	*[0.058]****	*[0.070]****
Government UCR$_{t-1}$ (α_1)	0.067	−0.522	−1.102	−1.074
	(0.172)	*(0.223)* **	*(0.685)* *	*(0.558)* *
	[0.150]	*[0.254]**	*[0.684]*	*[0.560]**
IRA$_{t-1}$ (α_2)	0.105	−0.122	0.405	0.870
	(0.129)	*(0.161)*	*(0.258)*[a]	*(0.426)* **
	[0.119]	*[0.167]*	*[0.262]*	*[0.430]**
Government UCR$_{t-1}$ * IRA (α_3)	–	0.803	–	−1.123
	–	*(0.237)* ***	–	*(0.564)* **
	–	*[0.275]****	–	*[0.576]**
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
$\alpha_1 + \alpha_3$	–	0.281		−2.075
	–	*(0.183)*		*(1.003)**
p-Value test on $\alpha_1 + \alpha_3 = 0$	–	0.125	–	0.038
p-Value test on $\alpha_2 + \alpha_3 = 0$	–	0.000	–	0.264
R squared	0.353	0.375	0.533	0.552
F Test (*p value*)	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	50 [353]	50 [353]	22 [93]	22 [93]

[a] *p* Value = 0.118.
* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

consistently with the typical negative outlook assigned to state-controlled firms (see Megginson and Netter, 2001). The result that market value of state controlled firms changes with the quality of domestic political institutions suggests that the empirical evidence is not consistent with an efficiency hypothesis (see Section 3.1).

It is worth noting that the *OECD Index of liberalization* is significant in all columns, albeit with opposite signs: positive in Columns (1) and (2) and negative in Columns (3) and (4). If one recalls that the index is lower when competition is tougher, the implications of our findings are clear. Whenever checks and balances are weak, equity markets attach a premium to firms that operate in less liberalized, more monopolistic markets where incumbents are more likely to be protected by the political power. In contrast, where political constraints on the executive are stronger, it is competition and market openness that convey value to firms.

In Table 6, we classify country-years observations based on electoral rules, as measured by the *Disproportionality* index. Recall (see Section 3.3) that low values of the index indicate highly fragmented political systems and divided governments, which, by making policy reversals more difficult, favor regulatory commitment (Levy and Spiller, 1994). In contrast, more cohesive governments in majoritarian systems are expected to leave more room to interfere in regulatory decisions. In fact, *Disproportionality* is negatively correlated with *C&B*, suggesting that checks and balances tend to be less strong in majority

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 *Proportionality Index* by Gallagher (1991), updated by Bortolotti and Pinotti (2008) is a continuous and time varying index of parliamentary fragmentation. The explanatory variables are defined in Section 4. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. Errors are clustered at firm (round parentheses) and sector (square parentheses) level.

Dependent variable: MTB ratio	Degree of electoral proportionality			
	(1) Low proportionality	(2) Low proportionality	(3) High proportionality	(4) High proportionality
Leverage$_{t-1}$	−0.291	−0.322	0.123	0.122
	(0.143) **	*(0.139)* **	*(0.294)*	*(0.301)*
	*[0.128]***	*[0.132]***	*[0.311]*	*[0.319]*
EBIT-to-Total Assets$_{t-1}$	0.194	0.183	−0.707	−0.709
	(0.153)	*(0.140)*	*(0.493)*	*(0.450)*
	*[0.111]**	*[0.099]**	*[0.547]*	*[0.500]*
Log of real total assets$_{t-1}$	−0.223	−0.239	−0.417	−0.416
	(0.102) **	*(0.097)* **	*(0.156)* ***	*(0.162)* ***
	*[0.105]***	*[0.099]***	*[0.164]***	*[0.171]***
Investor Protection$_t$	0.019	−0.003	0.103	0.103
	(0.059)	*(0.057)*	*(0.225)*	*(0.222)*
	[0.044]	*[0.042]*	*[0.308]*	*[0.307]*
GDP Growth$_t$	0.002	0.015	0.041	0.041
	(0.057)	*(0.054)*	*(0.076)*	*(0.074)*
	[0.066]	*[0.062]*	*[0.083]*	*[0.081]*
Debt/GDP$_t$	−0.293	−0.202	0.163	0.164
	(0.939)	*(0.828)*	*(0.759)*	*(0.760)*
	[0.975]	*[0.836]*	*[0.879]*	*[0.882]*
OECD Index of Liberalization$_t$	0.064	0.059	−0.131	−0.130
	(0.058)	*(0.055)*	*(0.063)* **	*(0.065)* **
	*[0.033]**	*[0.033]**	*[0.075]**	*[0.074]**
Government UCR$_{t-1}$ (α_1)	0.140	−0.436	−0.520	−0.526
	(0.197)	*(0.296)*	*(0.442)*	*(0.339)*
	[0.173]	*[0.262]*	*[0.484]*	*[0.371]*
IRA$_{t-1}$ (α_2)	0.154	−0.019	0.0069	0.005
	(0.104)	*(0.110)*	*(0.163)*	*(0.234)*
	[0.120]	*[0.104]*	*[0.178]*	*[0.259]*
Government UCR$_{t-1}$ * IRA (α_3)	–	0.875	–	0.009
	–	*(0.345)* ***	–	*(0.288)*
	–	*[0.266]****	–	*[0.316]*
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
$\alpha_1 + \alpha_3$	–	0.440	–	−0.517
	–	*(0.210)***	–	*(0.536)*
p-Value test on $\alpha_1 + \alpha_3 = 0$	–	0.036	–	0.335
p-Value test on $\alpha_2 + \alpha_3 = 0$	–	0.006	–	0.938
R squared	0.379	0.393	0.477	0.477
F Test (*p* value)	0.000	0.000	0.000	0.000
N. Firms [N. Obs.]	38 [271]	38 [271]	26 [177]	26 [177]

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

rule systems. At the country level, we find that, on average, Denmark, Holland, Germany and Sweden score lower on the *Disproportionality Index*, while, at the opposite end of the distribution, France has the highest score for the index, hence appearing to be as the most majority rule oriented, and the UK, Greece and Italy also exhibit relatively higher indexes. Fig. 3 plots the time trend of both *Checks and Balances* and *Disproportionality* for a subset of countries.

In Table 6, we report the results. In order to make comparisons with Table 5 easier, we have inverted the *Disproportionality Index* so that *high* proportionality (hence high political fragmentation), by construction, can be interpreted similarly to *high* checks and balances. We then use the 75th percentile value of the distribution of the *Electoral Proportionality* (*EP*) index (28.5) as threshold to split the sample.

Our results show that the coefficient on the *GovernmentUCR* ∗ *IRA* interaction in Column (2) is positive and statistically significant, suggesting that when the IRA is in place, the larger the stake held by the state, the higher the firm's market value, in countries where parliament tends to be elected according to a majority rule, i.e., in countries with low levels of *Electoral Proportionality*. In contrast, when we turn to more fragmented parliamentary systems which, in theory make either the decision process and policy reversals more difficult, the results show that residual state ownership of regulated firms is irrelevant for firm value (see Columns (3) and (4)).

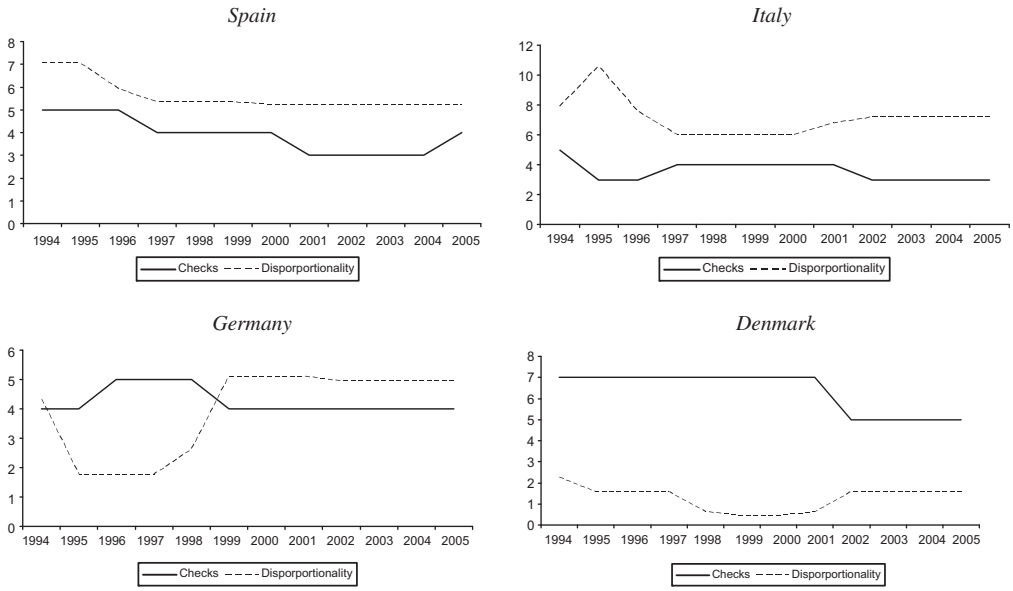

Fig. 3. Political indicators in selected EU countries. *Checks & Balances* – source: Beck et al. (2001) – and *Gallagher Political Institutions Disproportionality Index* (*source*: Gallagher (1991) and Bortolotti and Pinotti (2008).

Similarly to Table 5, the *OECD Index of liberalization* enters with an opposite sign in the two sub-groups, confirming that lack of competitive pressure is rewarded (punished) within less (more) fragmented political systems. When we consider the overall impact of government ownership on firm value, whenever the IRA exists and political fragmentation is low, we find that the sum $\alpha_1 + \alpha_3 * [IRA = 1] = 0.439$ is significant with a p-value of 0.036 (in Table 5, with low checks and balances, the total effect was 0.281, and the p-value was 0.125).

Overall the results in Tables 5 and 6 suggest that government ownership is conducive to higher market value only when the institutional setting allows politicians to interfere in regulatory decisions.[21]

6.2. Instrumental variable results

In Section 3, we argued that state ownership should affect particularly firm value when political institutions allow governments to intervene with formally independent regulators and discussed why state ownership and IRAs are potentially endogenous in this relationship. We now look for more systematic evidence using instrumental variable estimation (two-stage least squares, 2SLS) and rely on *Checks and Balances*, or *Electoral Proportionality*, to instrument *Government UCR*, *IRA* and their interaction (*Government UCR* $*$ *IRA*), along with other country-specific variables (*Political Orientation*, *Government Stability* and *Election Date*). Because our statistical model is over-identified (we have more instruments than endogenous variables), we then test the over-identifying restrictions and identify the impact of state ownership and IRA on firm value by testing the exclusion restriction that *Checks and Balances* (or *Electoral Proportionality*) does not significantly enter 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 include *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 government is more "right-wing", while the negative coefficients on *Checks and Balances* and *Proportionality* indicate that privatizations tend to be more "reluctant" (i.e. *Government UCR* are larger) where the institutional constraints on discretionary executive power are weaker. The results in Columns (3) and (4) suggest that the setting up of the IRAs was positively associated with conservative governments and political fragmentation, and negatively correlated with checks and balances.[22] More importantly from our point of view, Columns (5) and (6) show that, when the IRA is in place, residual state ownership (*Government UCR* $*$ *IRA*) is significantly larger where institutional checks and balances are weaker and electoral

[21] In the Appendix, we report the results when the same estimation strategy is applied to the full sample, which includes also firms in utility sectors regulated not by an independent authority, but by a branch of the government such as ministries or governmental committees. Our findings are very similar: when checks and balances are low and party systems less fragmented, larger government stakes lead to higher firm value. We also re-estimate the market value regressions for the sub-samples in the first quartile (very low quality) of the distributions of the political institutions indexes (to be contrasted with the results from the sub-sample in the fourth quartile - very high quality). The results confirm that, as we predict, the market value of state controlled utilities is significantly higher when they are regulated by IRAs that operate subject to weak political institutions. Results are available upon requests.

[22] Indeed, because the inception of IRAs followed EU Directives, this relation is also influenced by the timing of the implementation of the norm.

Table 7.1
Market-to-book and the role of political and institutional variables: First stage analysis. Sample of energy and telecom regulated firms. Checks and Balances, Proportionality Index, Political orientation, Election Date, Government Stability, and OECD Index of Liberalization are defined in Section 4. Firm and year dummies included. Robust standard errors in parentheses.

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 $Orientation_{t-1}$	−0.016**	−0.006	0.067***	0.061***	0.001	0.009
	(0.006)	*(0.006)*	*(0.011)*	*(0.012)*	*(0.005)*	*(0.005)*
Election $Date_{t-1}$	−0.021	−0.041	0.015	0.010	0.007	−0.009
	(0.034)	*(0.030)*	*(0.099)*	*(0.101)*	*(0.034)*	*(0.033)*
Government $Stability_{t-1}$	−0.018	−0.020	−0.003	0.029	−0.018	−0.019
	(0.018)	*(0.017)*	*(0.038)*	*(0.036)*	*(0.018)*	*(0.018)*
Checks & $Balances_{t-1}$	−0.039**	–	−0.050[a]	–	−0.033**	–
	(0.016)	–	*(0.031)*	–	*(0.015)*	–
Proportionality $Index_{t-1}$	–	−0.034***	–	0.031**	–	−0.028***
	–	*(0.007)*	–	*(0.015)*	–	*(0.007)*
Additional instruments: Leverage, EBIT-Total Assets, Log Tot Assets, Investor protection, GDP growth						
F Test (p value)	2.90 (0.000)	3.48 (0.000)	13.83 (0.000)	13.08 (0.000)	3.33 (0.000)	3.65 (0.000)
N. Firms [N. Obs.]	57 [449]	57 [449]	57 [449]	57 [449]	57 [449]	57 [449]

[a] p Value = 0.118.
* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

proportionality is lower (and vice versa), consistently with the idea that more unified and less accountable governments are more reluctant to relinquish control over politically sensitive public utilities from which economic or financial rents can be extracted. Overall, the first-stage results suggest that, of all the used instruments, *Checks and Balances* and *Electoral Proportionality* are possible determinants of the endogenous variables and, more to the point, are quite useful explanatory variables of the *Government UCR* ∗ *IRA* interaction which, in the second stage, captures the impact of residual state ownership under the IRA.

In Table 7.2, we report second stage estimates. The instrument set alternates *Checks and Balances* in Column (1) and *Electoral Proportionality* in Column (2). The 2SLS results show that *Government UCR* enters with a negative sign in both columns (1) and (2), but is significant only in Column (2) while the coefficient on the IRA dummy is negative and significant in both specifications. More importantly, the interaction *Government UCR* ∗ *IRA* is positive and significant in all columns, which supports our hypothesis that the presence of the government as a shareholder boosts the regulated firm's value, providing a sort of indirect protection that is apparently recognized and rewarded by the capital markets. The total effect of state ownership, when the IRA exists, is positive and significant in Column (1). The total effect of the IRA on market value (measured by $\alpha_2 + \alpha_3 * GovernmentUCR$) is positive for ownership stakes ranging from 30% to 40% while the sums of the coefficients are highly significant in both columns.

We test the over-identifying restrictions by calculating the Sargan-Hansen for the full set of instruments as well as the Difference-in-Sargan statistics for *C&B* (Column (1)) and *EP* (Column (2)) indices, which we use as instruments, along with *Political Orientation*, *Election date* and *Government Stability*. Moreover, likewise Tabellini (2010), we also test the validity of our exclusion restrictions by including *C&B* and *EP* directly in the regressions reported in Columns (3) and (4), respectively.

Comfortingly, the Hansen *J*-statistics suggests that the set of instrument we use in both specifications are valid and the Difference-in-Sargan tests on *C&B* and *EP* indicate that they are individually valid instruments. In addition, at the bottom of the table we also report the *p*-values of the exogeneity tests for each of the included instruments – firm, industry and country control variables. Finally, in Columns (3) and (4) we further test the exclusion restrictions by entering *C&B* and *EP* as regressors in the second stage regressions. As shown in the table, once included in the MTB regression, both variables are statistically insignificant, while the main results remain unchanged.[23]

Consistently with the theoretical framework in Section 3, the empirical analysis shows that political institutions seem to affect IRA regulated firms' market value, but indirectly and primarily through the effect of residual government stakes in regulated firms.

6.3. Robustness tests: endogenous liberalization and the role of culture

To check the robustness of our results, in this section we take into account the possible endogeneity of market liberalization and we test the role of a country's social capital and culture in establishing market regulation.

In Table 8 we report additional 2SLS estimates where we control for the potential endogeneity of the *OECD Index of Liberalization*. Indeed, the decision to liberalize a market might be affected by the market power of incumbent firms as reflected

[23] We perform similar tests on *Political Orientation*, *Government Stability* and *Election Date*, 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.

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 and instrumental variables are defined in Section 4. Checks & Balances is included as instrument in Col. 1 and as regressor in Col. 3. Proportionality Index is included as instrument in Col. 2 and as regressor in Col. 4. The Hansen *J* statistic tests the null of the validity of all instruments. For the individual variables we report the difference-in-Sargan test that suspect regressors or instruments are exogenous. Firm and year dummies included. Robust standard errors in parentheses.

Dependent variable: MTB ratio	C&B as instrument (1)	Prop. Index as instrument (2)	C&B as regressor (3)	Prop. index as regressor (4)
Leverage$_{t-1}$	−0.114	−0.251*	−0.271	−0.325
	(0.156)	*(0.066)*	*(0.249)*	*(0.235)*
EBIT-to-Total Assets$_{t-1}$	0.205*	0.189**	0.175*	0.174*
	(0.108)	*(0.095)*	*(0.104)*	*(0.103)*
Log of Real Total Assets$_{t-1}$	−0.150**	−0.227***	−0.239*	−0.269**
	(0.067)	*(0.066)*	*(0.130)*	*(0.112)*
Investor Protection$_t$	−0.054	−0.046	−0.014	−0.013
	(0.050)	*(0.046)*	*(0.077)*	*(0.096)*
GDP Growth$_t$	0.084**	0.107***	0.114*	0.126*
	(0.040)	*(0.041)*	*(0.060)*	*(0.068)*
Debt/GDP$_t$	−0.470	−0.224	0.104	−0.341
	(0.414)	*(0.458)*	*(0.951)*	*(0.578)*
OECD Index of Liberalization$_t$	0.068	0.043	0.045	0.024
	(0.045)	*(0.048)*	*(0.058)*	*(0.062)*
Government UCR$_t$ (α_1)	−1.202	−3.386**	−4.151	−4.380
	(1.315)	*(1.651)*	*(4.190)*	*(3.187)*
IRA$_t$ (α_2)	−0.824**	−1.304***	−1.562	−1.370**
	(0.338)	*(0.507)*	*(1.027)*	*(0.592)*
Government UCR$_t$ ∗ IRA (α_3)	3.133***	3.496***	3.799***	3.388***
	(0.986)	*(1.096)*	*(1.358)*	*(1.099)*
Checks & Balances$_{t-1}$	–	–	−0.135	–
	–	–	*(0.175)*	–
Proportionality Index$_{t-1}$	–	–	–	−0.037
	–	–	–	*(0.091)*
Firm dummies	*yes*	*yes*	*yes*	*yes*
Time dummies	*yes*	*yes*	*yes*	*yes*
Hansen *J* (all instruments) (*p* value)	0.639	0.857	0.799	0.806
C&B Index (Col.1)/Prop. Index (Col.2) (*p* value)	0.447	0.852	–	–
Leverage (*p* value)	0.444	0.851	–	–
EBIT-to-Total Assets (*p* value)	0.621	0.607	–	–
Log of real Total Assets (*p* value)	0.634	0.646	–	–
Investor protection (*p* value)	0.533	0.584	–	–
GDP Growth (*p* value)	0.398	0.631	–	–
Debt/GDP (*p* value)	0.945	0.579	–	–
OECD Index of Liberalization (*p* value)	0.469	0.689	–	–
F Test (*p* value)	5.79 (0.000)	5.67 (0.000)	5.25 (0.000)	4.97 (0.000)
N. Firms [N. Obs.]	57 [449]	57 [449]	57 [449]	57 [449]
$\alpha_1 + \alpha_3$	1.931*	0.110		
	(0.998)	*(0.974)*		
p-Value test on $\alpha_1 + \alpha_3 = 0$	0.053	0.910	–	–
p-Value test on $\alpha_2 + \alpha_3 = 0$	0.006	0.005	–	–

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

in their market value: high market-to-book ratios might stem from monopolistic rents due to barriers to entry, economies of scale, or other factors that thwart competition in the industry. Hence, a government with a strong commitment to structural reforms may decide to concentrate liberalization efforts in markets where firm value is relatively high. Alternatively, a powerful incumbent may exert pressure on politicians to hinder or delay antitrust and regulatory interventions. To account for this possible source of reverse causality, we endogenize also the *OECD Index of Liberalization* using the same instrumental variables reported described in Section 6.2. The instrument set used for the IV estimates in Table 8 alternate, as in Table 7.2, *Checks and Balances* in Column (1) and *Electoral Proportionality* in Column (2). As before, the results show that the IRA dummy has a negative sign and is significant in both specifications, while the interaction *Government UCR ∗ IRA* is positive and significant in both columns.[24]

[24] Similar results obtain when we test the potential endogeneity of the *Investor Protection* index. Even in this case, the interaction term *Government UCR∗IRA* remains positive and highly significant, confirming our main results. Results are available upon request.

Recent studies show that government regulation is negatively correlated with social capital. In particular, Aghion et al. (2012) show that *distrust* in others, in markets and institutions generates demand for regulation since people prefer state control rather than the entrepreneurial activity by people they do not trust. In particular, Aghion et al. (2010) find that culture and institutions coevolve: culture affects institutions, and institutions affect culture. This symbiotic relation could affect the interplay between government ownership of firms, regulation and the quality of political institutions so that the prevailing culture in society could be an important omitted variable biasing our empirical analysis. To control partly for this bias, we introduce a new country specific and time-varying variable, *Distrust,* drawn from the World Values Survey, covering 1995 and the 1999–2003 waves.[25] Our measure *Distrust* is derived from answers to the following question: "*Generally speaking, would you say that most people in your country can be trusted or that you need to be very careful in dealing with people*?". This index ranges from 0 (if the respondent answers "Most people can be trusted") to 1 (if she answers "I need to be very careful"). Results of IV estimates when *Distrust* is used as new instrument are reported in Columns (3) and (4) of Table 8. In Column (3) we first test whether the *Distrust* variable has some direct impact on firm's market-to-book value introducing it as a regressor. Estimate in Column (3) shows that *Distrust* does not affect firm value directly. We then use *Distrust* as an additional instrument (Column (4)), our interaction term *Government UCR* $*$ *IRA* increases, while remaining positive and statistically significant. The same holds for the sum $\alpha_1 + \alpha_3 * [\text{IRA} = 1] = 1.774$. These results suggest that social capital, or the lack thereof, could be an important factor affecting the link between residual stakes of state ownership and the value of regulated firms.

7. Sensitivity analysis

In this section, we present the results of three sensitivity tests. In the first one, we employ an alternative political economy variable to proxy for the institutional constraints on discretionary executive power; in the second one, we check the robustness of our results when we exclude UK firms, and in the third one, we use a threshold variable (the dummy *UCR30%*) to define the firm-year ownership status of the firms instead of the continuous *GovernmentUCR* variable.

When one employs country specific variables meant to measure and compare characteristics of the institutional endowments of many nations, one has to pay attention that these variables display enough variation over time. As shown by descriptive statistics in Table 3 and in Fig. 3, both *CB* and *EP* exhibit considerable variation both across countries and over time for our sample of EU member states. In addition, the two variables originate from two different databases, *C&B* constructed by the World Bank and *EP* originally designed, implemented and updated by political economy researches (Gallagher, 1991; Lijphart, 1999; Bortolotti and Pinotti, 2008). To provide a further check, we employ a third political economy variable, the *Political Constraints Index, POLCON-V*, constructed by Henisz (2000, 2012), which measures the constraints on political behavior imposed by the political institutions as well as by the credibility of the political system, such as the presence of separate legislative houses, the internal structure of the judiciary and federal institutions, and the effective systems of checks and balances, etc. The main difference between *Political Constraints* (*PC*) and *Checks and Balances* is that the latter assumes a linear relationship between the number of adjusted veto points and the degree of constraints on policy change, while *PC* accounts for the diminishing marginal returns to the addition of veto players (Tsebelis, 2003) by allowing for the alignment across branches of government that increases the feasibility of policy changes and reduces the level of political constraints. Similarly to *C&B* and *EP*, also the *Political Constraint Index* varies over time thus allowing for institutional changes.[26]

In Columns (1) and (2) of Table 9, the sample is split between "low" (*PC* less than 0.758, the 75th percentile of the index distribution) and "high" (*PC* greater than 0.758) political constraints while in Column (3) we report the 2SLS estimate and in Column (4) our test of the exclusion restriction (as in Table 7.2). Results confirm the evidence we have found in previous tables: where the political constraints on government's room for maneuver are weak, state ownership has a positive effect on market-to-book ratios. In contrast, where *PC* is high, the *GovernmentUCR* $*$ *IRA* interaction becomes insignificant (Column (2)). When we account for endogeneity of *GovernmentUCR* and *IRA* using the *PC* index as additional instrument in the 2SLS regression, we find that the interacted term is positive and highly significant and that the total effect of state ownership when the IRA is in place is highly significant and quantitatively large (Columns (3) and (4)).

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, in the UK, independent regulators for telecommunications, energy and water supply were set up as early as in the Eighties and most firms were fully privatized even before. This peculiarity suggests that we check the robustness of our results on a sample that excludes UK firms.

In Table 10, we re-estimate the model with the *Government UCR* $*$ *IRA* interaction for the energy and telecom non-UK firms (Column (1)), as well as for the sub-samples with low *C&B* and *EP* (Columns (2) and (3)) and with 2SLS (Column (4)). Comfortingly, the results are very similar to those reported in Tables 5–7 thus supporting our predictions. In Column (1) the OLS coefficient on the *Government UCR* $*$ *IRA* interaction is positive and not far from significance (p-value = 0.11),

[25] For more details, see the web portal of the World Values Survey Association: www.worldvaluessurvey.org.

[26] Initially, we intended to use an analogous variable taken from the POLITY-IV database, but we noticed that the XCONST (Executive constraints) variable did not exhibit the sufficient time variation, possibly because the index is normalized for a longer period (since 1800) with respect to the World Bank *C&B* index (since 1975) and *POLCON-V* (since 1960). Strausz (2011) indicates that Beck et al. (2001) and Henisz (2012) databases are appropriate variables to represent political systems (p. 27).

Table 8
Endogenous liberalization and the effect of social capital on government regulation. 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 and instrumental variables are defined in Section 4. Distrust is defined in Section 6.2. The Hansen *J* statistic tests the null of the validity of all instruments. For the individual variables we report the difference-in-Sargan test that suspect regressors or instruments are exogenous. Firm and year dummies included. Robust standard errors in parentheses.

Dependent variable: MTB ratio	Market liberalization		Distrust as regressor	Distrust as instrument
	C&B as instrument (1)	Prop. index as instrument (2)	(3)	(4)
$Leverage_{t-1}$	−0.156	−0.218	−0.141	−0.120
	(0.151)	*(0.133)*	*(0.150)*	*(0.152)*
$EBIT\text{-}to\text{-}Total\ Assets_{t-1}$	0.153	0.141	0.187*	0.205*
	(0.105)	*(0.105)*	*(0.099)*	*(0.107)*
$Log\ of\ real\ total\ assets_{t-1}$	−0.146**	−0.182***	−0.165***	−0.157**
	(0.066)	*(0.064)*	*(0.064)*	*(0.064)*
$Investor\ Protection_t$	−0.095	−0.092	−0.047	−0.052
	(0.074)	*(0.070)*	*(0.048)*	*(0.048)*
$GDP\ Growth_t$	0.076*	0.086**	0.086**	0.087**
	(0.042)	*(0.042)*	*(0.038)*	*(0.040)*
$Debt/GDP_t$	−0.588	−0.462	−0.587	−0.452
	(0.420)	*(0.408)*	*(0.393)*	*(0.413)*
$OECD\ Index\ of\ Liberalization_t$	−0.044	−0.060	0.045	0.073
	(0.067)	*(0.071)*	*(0.043)*	*(0.046)*
Government UCR_t (α_1)	−0.781	−1.782	−1.398	−1.436
	(1.373)	*(1.367)*	*(1.348)*	*(1.225)*
IRA_t (α_2)	−1.044**	−1.209**	−0.709**	−0.811**
	(0.470)	*(0.538)*	*(0.346)*	*(0.341)*
Government $UCR_t * IRA$ (α_3)	2.494***	2.598**	2.980***	3.211***
	(0.987)	*(1.061)*	(0.920)	*(1.018)*
$Distrust_t$	–	–	−1.403	–
	–	–	*(1.141)*	–
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
F test (*p* value)	0.000	0.000	0.000	0.000
$\alpha_1 + \alpha_3$	1.712**	0.816	1.582	1.774**
	(0.814)	*(0.640)*	*(1.063)*	*(0.899)*
p-Value test on $\alpha_1 + \alpha_3 = 0$	0.036	0.202	0.137	0.049
p-Value test on $\alpha_2 + \alpha_3 = 0$	0.018	0.022	0.003	0.004
Hansen *J* (all instruments) (*p* value)	0.731	0.598	0.545	0.743
Diff-in-Sargan: C&B/Prop Ind./Trust (*p*-Value)	0.538	0.539	0.587	0.569
N. Firms [N. Obs.]	57 [449]	57 [449]	57 [449]	57 [449]

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

but becomes highly significant for firm-year observations subject to weaker checks and balances and less proportional party systems in Columns (2) and (3). When we turn to the IV results, we find that *Government UCR* ∗ *IRA* is positive and highly significant, which indicates that our results do not depend on the presence (or the absence) of a country, such as the UK where privatization and liberalization reforms date back to the Eighties.

In the third robustness check, we replace the continuous ownership variable with a dummy. We thus use a plausible threshold of state ownership and construct a dummy that equals 1 when the Government UCR are equal to or greater than 30%, to account for the fact that the state is likely to act as controlling shareholder even if it owns less than 50% of shares (recall that 30% is the control threshold for the "Takeover Bid" Directive of the European Commission).

Table 11 reports the results from estimating the usual specification, except that the continuous *GovernmentUCR* variable is replaced by the *UCR30%* dummy. 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 also take the quality of political institutions into account. In fact, the positive effect of state ownership for IRA regulated firms is highly significant when checks and balances are weak and electoral proportionality, as a proxy for political fragmentation is low (Columns (2) and (3) respectively) as well as when we use 2SLS (Column (4)). Quite in line with our theoretical framework, in political contexts where governments wield power to interfere with regulatory decisions, politicians may find it profitable to retain stakes in firms to benefit from the advantages of a soft regulatory regime.

Table 9
Robustness: market value, ownership and Political Constraints. 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 in Section 4. The *Political Constraints Index* by Henisz (2000, 2012) measures the restrictions to the behavior of politicians imposed by the political institutions and by the credibility of the political system. The Hansen *J* statistic tests the null of the validity of all instruments, the difference-in-Sargan tests that suspect regressors or instruments are exogenous. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. Errors are clustered at firm (round parentheses) and sector (square parentheses) level.

Dependent variable: MTB ratio	(1) Low political constraints OLS	(2) High political constraints OLS	(3) I.V.	(4) I.V.
Leverage$_{t-1}$	0.016	−0.049	−0.075	−0.290
	(0.143)	*(0.299)*	*(0.181)*	*(0.353)*
	[0.151]	*[0.280]*	–	–
EBIT-to-Total Assets$_{t-1}$	0.280	−0.751	0.210	0.163
	(0.155)*	*(0.599)*	*(0.119)**	*(0.108)*
	[0.134]**	*[0.640]*	–	–
Log of Real Total Assets$_{t-1}$	−0.226	−0.174	−0.127	−0.232
	(0.094)**	*(0.113)*	*(0.071)**	*(0.172)*
	[0.098]**	*[0.110]*	–	–
Investor Protection$_{t}$	−0.016	0.001	−0.060	−0.066
	(0.076)	*(0.068)*	*(0.056)*	*(0.051)*
	[0.075]	*[0.074]*	–	–
GDP Growth$_{t}$	−0.009	0.121	0.083	0.117
	(0.036)	*(0.088)*	*(0.045)**	*(0.070)**
	[0.038]	*[0.088]*	–	–
Debt/GDP$_{t}$	−1.400	−0.134	−0.524	−0.011
	(0.500)***	*(0.845)*	*(0.452)*	*(0.974)*
	[0.530]***	*[0.846]*	–	–
OECD Index of Liberalization$_{t}$	−0.011	−0.035	0.082	0.027
	(0.047)	*(0.090)*	*(0.046)**	*(0.080)*
	[0.043]	*[0.089]*	–	–
Government UCR$_{t-1}$ (α_1)	−0.064	−0.604	−0.846	−3.621
	(0.223)	*(0.268)***	*(1.748)*	*(5.058)*
	[0.199]	*[0.276]***	–	–
IRA$_{t-1}$ (α_2)	−0.047	−0.165	−0.732	−1.271
	(0.139)	*(0.222)*	*(0.403)**	*(0.974)*
	[0.135]	*[0.220]*	–	–
Government UCR$_{t-1}$ * IRA$_{t-1}$ (α_3)	0.361	−0.042	3.306***	3.298
	(0.188)*	*(0.426)*	*(1.244)*	*(1.069)****
	[0.188]*	*[0.460]*	–	
Political Constraint$_{t-1}$	–	–	–	2.166
	–	–	–	*(3.206)*
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
$\alpha_1 + \alpha_3$	0.297*	−0.646	2.460**	–
	(0.180)	*(0.559)*	*(1.042)*	–
p-Value test on $\alpha_1 + \alpha_3 = 0$	0.100	0.248	0.018	–
p-Value test on $\alpha_2 + \alpha_3 = 0$	0.061	0.571	0.006	–
R squared	0.330	0.440	–	–
F test (*p* value)	0.000	0.000	0.000	0.000
Hansen *J* (all instruments) (*p* value)	–	–	0.598	0.434
Diff-in-Sargan: Pol. Con Index (*p* value)	–	–	0.391	–
N. Firms [N. Obs.]	44 [325]	21 [120]	57 [449]	57 [449]

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

8. Conclusions

Over the last 20 years and around the world, the regulation of utilities has been entrusted to independent agencies, in order to improve market efficiency and tame 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 controlled by the state. Consequently, regulatory independence and residual state ownership are intertwined institutional features that may affect firm operating and financial decisions, and ultimately its market value.

Table 10
Robustness: market value, ownership and IRA excluding UK firms. Sample of non-UK 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, C&B (*Checks & Balances*) and the *Proportionality Indexes* are defined in Section 4. The Hansen *J* statistic tests the null of the validity of all instruments, The difference-in-Sargan tests that suspect regressors or instruments are exogenous. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. Errors are clustered at firm (round parentheses) and sector (square parentheses) level.

Dependent variable: MTB ratio	(1) OLS	(2) Low C&B OLS	(3) Low proportionality OLS	(4) I.V.
Leverage$_{t-1}$	−0.068	−0.044	−0.349	0.014
	(0.174)	*(0.130)*	*(0.245)*	*(0.232)*
	[0.165]	*[0.134]*	*[0.205]**	–
EBIT-to-Total Assets$_{t-1}$	0.033	0.419	1.222	−0.042
	(0.467)	*(0.302)*	*(0.703)**	*(0.556)*
	[0.477]	*[0.300]*	*[0.632]**	–
Log of real total assets$_{t-1}$	−0.207	−0.142	−0.059	−0.012
	(0.103)**	*(0.056)***	*(0.081)*	*(0.132)*
	[0.104]**	*[0.059]***	*[0.080]*	–
Investor Protection$_{t}$	0.057	0.060	0.050	−0.069
	(0.047)	*(0.042)*	*(0.090)*	*(0.064)*
	[0.035]	*[0.029]***	*[0.082]*	–
GDP Growth$_{t}$	0.066	0.001	0.011	0.105
	(0.043)	*(0.026)*	*(0.043)*	*(0.050)***
	[0.042]	*[0.022]*	*[0.039]*	–
Debt/GDP$_{t}$	−0.139	−1.124	1.883	−0.615
	(0.512)	*(0.546)***	*(2.191)*	*(0.514)*
	[0.621]	*[0.617]**	*[2.160]*	–
OECD Index of Liberalization$_{t}$	0.006	0.167	−0.019	0.116
	(0.068)	*(0.072)***	*(0.138)*	*(0.074)*
	[0.065]	*[0.038]****	*[0.129]*	–
Government UCR$_{t-1}$ (α_1)	−0.281	−0.554	−0.304	−0.454
	(0.219)	*(0.242)***	*(0.321)*	*(1.164)*
	[0.232]	*[0.237]***	*[0.280]*	–
IRA$_{t-1}$ (α_2)	0.070	−0.206	0.007	−0.951
	(0.113)	*(0.133)*	*(0.106)*	*(0.380)***
	[0.106]	*[0.144]*	*[0.097]*	–
Government UCR$_{t-1}$ * IRA$_{t-1}$ (α_3)	0.282	0.933	0.663	2.932
	(0.176)	*(0.211)****	*(0.370)**	*(1.192)***
	[0.220]	*[0.212]****	*[0.272]***	–
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
$\alpha_1 + \alpha_3$	0.001	0.380**	0.355	2.478**
	(0.278)	*(0.173)*	*(0.224)*	*(1.224)*
p-Value test on $\alpha_1 + \alpha_3 = 0$	0.996	0.028	0.109	0.043
p-Value test on $\alpha_2 + \alpha_3 = 0$	0.022	0.000	0.046	0.038
R squared	0.307	0.384	0.408	–
F test (*p* value)	0.000	0.000	0.000	0.000
Hansen *J* (all instruments) (*p* value)	–	–	–	0.321
Diff-in-Sargan: Prop. Index (*p* value)	–	–	–	0.406
N. firms [N. Obs.]	45 [341]	38 [245]	26 [163]	45 [341]

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

In this paper, we have empirically studied the relationship between state ownership and firm 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 relation surfaces in countries where weak checks and balances and lower political fragmentation constrain less effectively executive power. Hence, where political institutions are weak, politicians may interfere with regulatory agencies in order to give state-owned firms preferential treatment. We label this regime reluctant regulation, a new concept contributing to explain why higher governments' stakes are associated with higher valuations, and why privatization is so often partial and incomplete in network industries. Under this regime, residual state ownership appears to be the main channel linking political institutions to firm value.

Table 11
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). *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 explanatory variables, C&B (*Checks & Balances*) and the *Proportionality Indexes* are defined in Section 4. The Hansen *J* statistic tests the null of the validity of all instruments, The difference-in-Sargan tests that suspect regressors or instruments are exogenous. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. Errors are clustered at firm (round parentheses) and sector (square parentheses) level.

Dependent variable: MTB ratio	(1) OLS	(2) Low C&B OLS	(3) Low proportionality OLS	(4) IV
Leverage$_{t-1}$	−0.172	0.152	−0.317	−0.058
	(0.129)	*(0.140)*	*(0.138)***	*(0.191)*
	[0.121]	*[0.138]*	*[0.126]***	–
EBIT-to-Total Assets$_{t-1}$	0.213	0.240	0.193	0.212
	*(0.126)**	*(0.134)**	*(0.145)*	*(0.157)*
	*[0.114)**	*[0.087]****	*[0.096]***	–
Log of real total assets$_{t-1}$	−0.250	−0.226	−0.243	−0.136
	*(0.088)****	*(0.087)****	*(0.097)***	*(0.083)**
	*[0.088]****	*[0.082]****	*[0.095]****	–
Investor Protection$_t$	0.032	0.043	0.004	−0.066
	(0.049)	*(0.051)*	*(0.056)*	*(0.064)*
	[0.031]	*[0.029]*	*[0.040]*	–
GDP Growth$_t$	0.045	−0.035	−0.001	0.075
	(0.041)	*(0.023)*	*(0.055)*	*(0.057)*
	[0.041]	*[0.023]*	*[0.059]*	–
Debt/GDP$_t$	−0.474	−1.331	−0.209	−1.373
	(0.481)	*(0.529)***	*(1.014)*	*(0.929)*
	[0.556]	*[0.635]***	*[0.970]*	–
OECD Index of Liberalization$_t$	0.032	0.109	0.076	0.068
	(0.051)	*(0.055)***	*(0.054)*	*(0.063)*
	[0.042]	*[0.037]****	*[0.029]****	–
UCR 30%$_{t-1}$ (α_1)	−0.079	−0.226	−0.227	−0.796
	(0.126)	*(0.169)*	*(0.148)*	*(1.007)*
	[0.133]	*[0.181]*	*[0.132]**	–
IRA$_{t-1}$ (α_2)	0.026	−0.057	0.083	−1.008
	(0.125)	*(0.175)*	*(0.120)*	*(0.423)***
	[0.118]	*[0.174]*	*[0.124]*	–
UCR 30%$_{t-1}$ * IRA$_{t-1}$ (α_3)	0.083	0.498	0.518	2.603
	(0.150)	*(0.172)****	*(0.172)****	*(0.981)****
	[0.158]	*[0.187]****	*[0.138]****	–
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
R squared	0.316	0.371	0.386	–
F test (*p* value)	0.000	0.000	0.000	0.000
$\alpha_1 + \alpha_3$	0.004	0.272**	0.290***	1.808*
	(0.202)	*(0.092)*	*(0.107)*	*(0.979)*
p-Value test on $\alpha_1 + \alpha_3 = 0$	0.984	0.032	0.007	0.065
p-Value test on $\alpha_2 + \alpha_3 = 0$	0.446	0.000	0.001	0.042
Hansen *J* (all instruments) (*p* value)	–	–	–	0.707
Diff-in-Sargan: Prop. Index (*p* value)	–	–	–	0.545
N. firms [N. Obs.]	57 [449]	50 [353]	38 [271]	57 [424]

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

Our results point toward possible regulatory failures in industrial systems dominated by state controlled incumbents and characterized by reluctant regulation. Under such circumstances, the state may benefit from and share with private shareholders an 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 European privatization and regulatory policy in network industries. 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 increased independence and public accountability. The analysis of the welfare effects of these policies is beyond the scope of this paper, but provides fertile ground for further research.

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Appendix A

See Table A1.

Table A1
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 *Checks & Balances* and *Electoral Proportionality* are defined in Section4. Standard errors in parentheses are robust to heteroschedasticity and to within group serial correlation. Errors are clustered at firm (round parentheses) and sector (square parentheses) level.

Dependent variable: MTB ratio	Checks and balances		Degree of electoral proportionality	
	(1) Low C&B	(2) High C&B	(3) Low proportionality	(4) High proportionality
$Leverage_{t-1}$	−0.037	−0.232	−0.138	0.218
	(0.116)	*(0.197)*	*(0.113)*	*(0.224)*
	[0.107]	*[0.196]*	*[0.101]*	*[0.213]*
$EBIT\text{-}to\text{-}Total\ Assets_{t-1}$	0.208	−0.947	0.207	−0.926
	(0.135)	*(0.675)*	*(0.159)*	*(0.465)***
	*[0.103]***	*[0.669]*	*[0.126]**	*[0.479]**
$Log\ of\ Real\ Total\ Assets_{t-1}$	−0.163	−0.071	−0.179	−0.380
	*(0.079)***	*(0.193)*	*(0.085)***	*(0.169)***
	*[0.076]***	*[0.192]*	*[0.081]***	*[0.166]***
$Investor\ Protection_t$	0.034	0.127	0.031	0.354
	(0.036)	*(0.155)*	*(0.041)*	*(0.191)**
	[0.041]	*[0.162]*	*[0.045]*	*[0.233]*
$GDP\ Growth_t$	0.037	0.165	0.069	0.083
	(0.027)	*(0.116)*	*(0.041)**	*(0.075)*
	[0.029]	*[0.116]*	*[0.046]*	*[0.074]*
$Debt/GDP_t$	−1.141	−0.596	−0.415	−0.507
	*(0.518)***	*(0.827)*	*(0.569)*	*(0.772)*
	*[0.564]***	*[0.848]*	*[0.561]*	*[0.841]*
Government UCR_{t-1} (α_1)	−0.410	−0.435	−0.433	−0.530
	*(0.123)****	*(0.454)*	*(0.159)****	*(0.355)*
	*[0.142]****	*[0.451]*	*[0.166]****	*[0.357]*
IRA_{t-1} (α_2)	−0.148	0.251	−0.070	−0.015
	(0.100)	*(0.375)*	*(0.083)*	*(0.245)*
	[0.106]	*[0.376]*	*[0.090]*	*[0.246]*
Government $UCR_{t-1} * IRA_{t-1}$ (α_3)	0.757	−0.049	1.012	0.290
	*(0.183)****	*(0.625)*	*(0.198)****	*(0.347)*
	*[0.225]****	*[0.627]*	*[0.201]****	*[0.347]*
Firm dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year dummies	*Yes*	*Yes*	*Yes*	*Yes*
$\alpha_1 + \alpha_3$	0.347**	−0.484	0.579***	−0.240
	(0.165)	*(0.894)*	*(0.140)*	*(0.583)*
p-Value test on $\alpha_1 + \alpha_3 = 0$	0.035	0.588	0.000	0.679
p-Value test on $\alpha_2 + \alpha_3 = 0$	0.000	0.562	0.000	0.105
R squared	0.269	0.371	0.291	0.430
F Test (*p* value)	0.00	0.00	0.00	0.00
N. Firms [N. Obs.]	80 [571]	27 [121]	66 [482]	31 [213]

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

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