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Liberalization-Privatization Paths: Policies and Politics[1]

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Abstract

We empirically investigate the political determinants of deregulation policies in six network industries of thirty OECD countries, over 1975-2007. Contrary to previous literature, we unbundle privatization and liberalization policies and measure whether their simultaneous determination is affected by government's ideology. Despite conventional wisdom, we find a systematic political trade-off between privatizations and liberalizations. Right-wing executives tend to privatize more and to liberalize less, relative to left-wing governments. The main lesson we derive is that ideological cleavages affect the composition of deregulation policy. Our results may shed new lights on the political-economic rationale behind deregulation choices.

Keywords: Liberalization; Privatization; Network Industries; Partisanship.
JEL Classification D72, L50, P16, C23

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1. Introduction

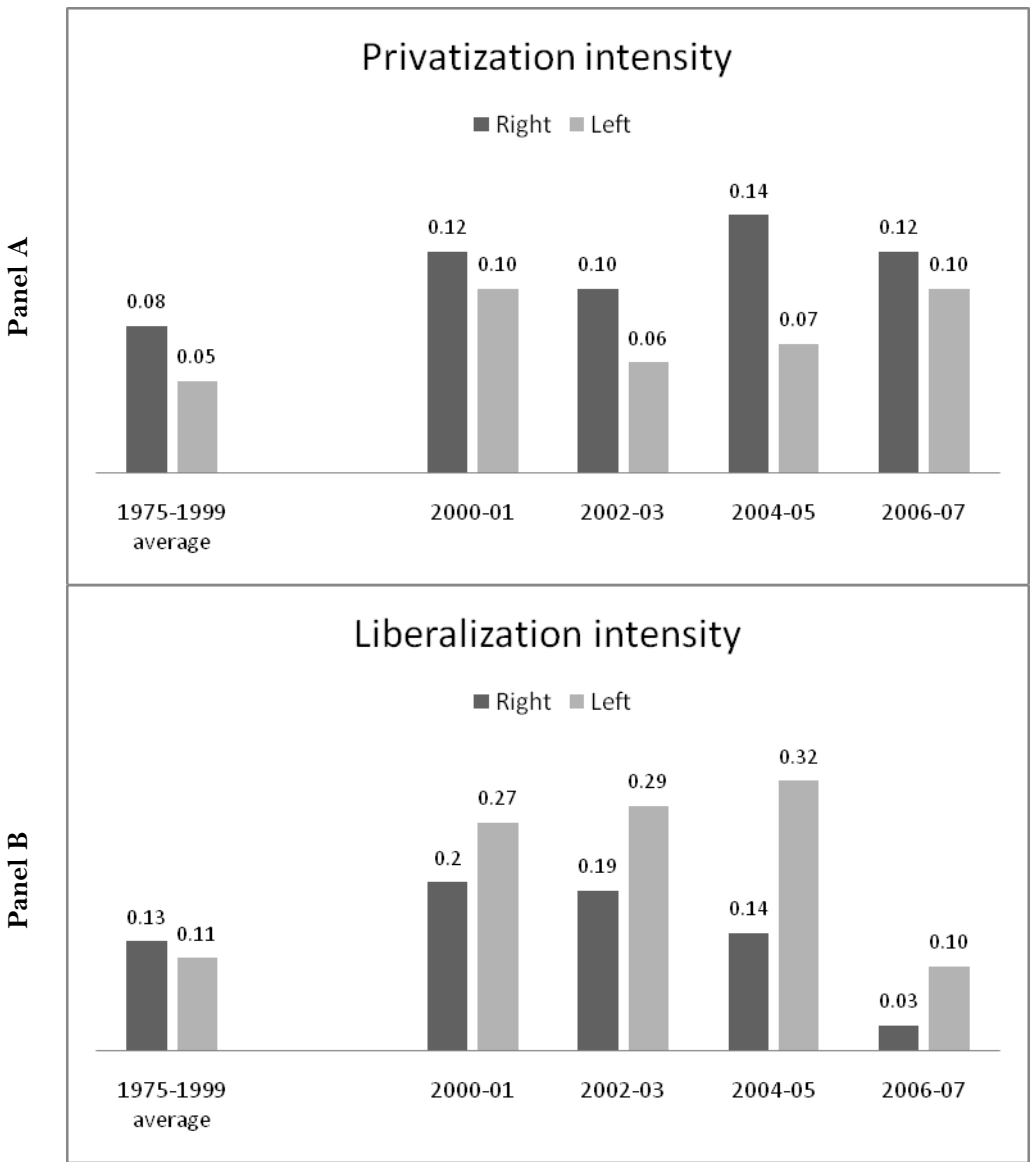
Politics and economic policies are not distinct domains. At the opposite, they are deeply interconnected. As Alesina and Rosenthal (1995) point out, partisan economic policy is the norm rather than the exception in parliamentary democracies. This holds for a large set of macroeconomic policies, covering the regulation of monetary, fiscal, labour, and industrial institutions, among others.

In this paper, we focus on industrial institutions, analyzing the political determinants of market-oriented policies in network industries. Specifically, we perform an econometric study of the relationship between partisanship and the evolution of the so-called 'deregulation policies' (i.e. liberalization and privatization) in the network sectors of thirty OECD countries.

In the last three decades, OECD network industries – such as utilities, communications and transport – experienced a deep wave of market-oriented policies (Conway and Nicoletti, 2006). On the one side, the conditions for having natural monopolies ceased to hold in a large part of these sectors because of technological developments, allowing for shared access of essential facilities (Lipenzynski *et al.* 2001; Newbery, 2002, 2004; Armstrong and Sappington, 2006), and thus stimulating the reduction of legal entry barriers by governments (the process named as 'liberalization'). On the other side, the lack of effective tools for disciplining managers in State-owned firms (Vickers and Yarrow, 1991; Megginson and Netter, 2001; Roland, 2008) induced the wide-spread sale of a substantial part of the State-owned shares in enterprises (the process named as 'privatization'), in order to encourage efficiency gains.

Governments' partisanship is likely to have played a role in this deregulation process. The comparison between data on deregulation policies (OECD, 2009) and executives' political orientation (World Bank, 2010) suggests that a relationship between ideology and privatization and liberalization choices might exist for OECD governments. As Figure 1 shows, contrary to a traditional view that deems both privatizations and liberalizations to be only in the agenda of right-wing executives (Friedman, 1962), it emerges in fact that from the late Nineties onward right-oriented governments undoubtedly pushed towards privatization policies more intensively than left-oriented ones, while left-wing executives pushed towards liberalization policies more intensively than right-oriented ones.

FIGURE 1. Privatization and liberalization intensity averaged over six network industries and 30 OECD countries for right-wing/left-wing governments (source: elaboration from OECD (2009) and World Bank (2010)).



Note: privatization is measured by subtracting the OECD's (2009) indicator of public ownership from its maximum value (the index ranges from 0 to 6): the privatization initiatives' intensity (panel A) is then calculated as two-year variations of the privatization index; liberalization is measured by subtracting the OECD's (2009) indicator of entry barriers from its maximum value (the index ranges from 0 to 6): the liberalization initiatives' intensity (panel B) is then calculated as two-year variations of the liberalization index. On the right side of the graph in both panels the average intensity before 2000 is displayed, on the left side two-year variations after 2000 are shown.

In this paper, we attempt to solve the puzzling pattern of Figure 1, by developing a systematic and rigorous econometric study of the political determinants of privatization

and liberalization policies in OECD network industries, so as to detect the existence and direction of causal effects, if any, behind the graphical correlation outlined above.

We employ the largest available database on deregulation policies (OECD, 2009), which covers 30 OECD countries observed over the period from 1975 to 2007. We use information on sectoral privatization and liberalization for six network industries (passenger air transport, telecommunications, electricity, gas, post, and rail), and thus exploit three sources of exogenous variation (country, time, and sectors). We then estimate two equations (one explaining privatization interventions and the other explaining liberalization interventions) using Seemingly Unrelated Regression (SUR), in order to account for the presence of unobservable factors, responsible for the simultaneous determination of privatization and liberalization policies.

Our econometric analysis shows, first, that both right-wing and left-wing governments adopt liberalization and privatization policies. Thus, we challenge the available empirical literature, which undermines left-wing initiatives both on privatizations (Appel, 2000; Bortolotti and Pinotti, 2008; Arin and Ulubasoglu, 2009) and on liberalizations (Duso, 2002; Pitlik, 2007; Potrafke, 2010). Second, we find that unbundling liberalization and privatization, and measuring the impact of partisanship on their joint adoption, reveals important information so-far neglected in the literature on the political determinants of market-oriented policies. Specifically, it emerges a sort of political trade-off in the way in which the two policies are combined by governments. Right-wing governments result to actually promote privatization to a greater extent than left-wing governments, while left-wing executives reveal to adopt liberalization policy more intensively than right-wing governments.[2]

We confirm the statistical robustness of our findings by controlling for several variables, such as (i) the existing regulatory conditions that executives find in each given sector, (ii) institutional capacity of governments and their political stability, (iii) policy diffusion mechanisms and (iv) supranational drivers of deregulation choices. We also checked that our estimates were not driven by outlier values.

[2] In this respect, our results are consistent with the increasing path of left-wing market-oriented initiatives observed in the last two decades, which political scientists named as 'the second wave neo-liberalism', to identify the pro-market policy agenda launched by President Clinton's 'market globalism' and Prime Minister Tony Blair's 'third way', that has then been rapidly embraced by the new left-center agenda of the leaders of traditional social democratic European parties (Roy *et al.*, 2006). This was the case, among others, of the Dutch Prime Minister Wim Kok, Italian Prime Ministers Romano Prodi and Massimo D'Alema, French Prime Ministers Pierre Beregovoy and Lionel Jospin, and the German Chancellor Gerard Schröder.

To the best of our knowledge, liberalization-privatization paths have been never disentangled in partisan-politics modeling (see Alesina (1988), Alesina and Tabellini (1988), and Roemer (2001) for an overview of the most influential models of political parties' interaction on economic policies). Our analysis contributes to this literature by showing that ideological cleavages affect the composition of deregulation policy – i.e. the combination of privatization and liberalization – rather than its aggregate level, as generally argued. Indeed, the empirical political economy literature has interpreted so-far privatization and liberalization policies as institutional complements, exclusively belonging to a consistent right-wing political domain. Our findings, by reversing these conclusions, shed new lights on a neglected political trade-off surrounding deregulation policies, and thus on potential unexplored political rationales behind policy choices in industry regulation. Furthermore, the policy mixes emerging from the sequencing of governments with different ideology, in turn, are likely to be the underpinning for the divergent patterns of GDP and investment growth observed across OECD economies (Alesina *et al.*, 2005).

The paper is organized as follows: section 2 briefly discusses the empirical literature on government ideology and deregulation; section 3 presents our estimation analysis of deregulation reforms in OECD network industries; in section 4 we check the robustness of our estimation results, controlling for the government's stability, policy diffusion and outlier values. Section 5 concludes.

2. Related literature

How governments should approach privatization (i.e. State-ownership reduction) and liberalization (i.e. entry barriers reduction) is a controversial issue (Roland, 2008). Liberalization and privatization policies generate effects with different sign on the consumers' welfare and on the profits of the incumbents and new entrants into the market, thus the global effect of the two policies depends on how governments weight the components of the social welfare function (De Fraja, 1991, 1994).

Concerning liberalizations, while these policies, according to economic theories, should benefit consumers (mainly through prices reduction and product innovation) and new entrants (by reducing entry barriers in markets with monopoly profits), they might also decrease the incumbent's profits on the one hand (by reducing the incumbent's market power and its incentives to develop technological innovations (Schumpeter, 1942)) and

increase them on the other (if the higher competition level entails an x-efficiency gain for the incumbent (Hart, 1983; Nalebuff and Stiglitz, 1983) or stronger incentives to innovate (Arrow, 1962)).

The overall effect of privatizations is ambiguous as well (Roland, 2008). In principle, privatizations should reduce the managerial slack in the incumbent privatized firm (Laffont and Tirole, 1988; Vickers and Yarrow, 1991), although privately run companies might anyway suffer from a loss of dynamic efficiency because of organizational conflicts, as long as agency problems occur between ownership and control (Roland, 2008; Jomo, 2008; Belloc, 2011). At the same time, however, the impact of privatizations on consumers' and new entrants' welfare is unclear. Privatizations might increase consumers' welfare by fostering quality improvements, but they might also increase final prices and/or reduce quantities for certain categories of consumers. Moreover, the new entrant firms might face either a profits gain or loss, depending on the efficiency's and costs' variation showed by the privatized incumbent (De Fraja, 1994). Finally, from the point of view of the State, even if privatizations imply a short-run cash gain for the government – through the sale of its shares in the privatized company –, these cash gains might be offset then by increased regulation costs, for example due to the establishment of antitrust authorities and regulatory agencies (Roland, 2008).

Notwithstanding the mixed predictions proposed by economic theories, the empirical literature on the political economy of deregulation is much more convergent in its findings, suggesting that governments – especially those guided by market-oriented political parties – should always favor deregulation policies, to increase total welfare. In particular, the empirical results so far available on the political determinants of economic policies reflect the conventional wisdom that right-wing governments tend to be more active than left-wing ones in implementing both privatizations and liberalizations.

As for privatization, Arin and Ulubasoglu (2009) perform a panel analysis on time-series data from a sample of cement Turkish firms over the 1984-1999 period and find that right-wing executives are more likely to undertake privatization initiatives with respect to left-wing ones. Similarly, Bortolotti and Pinotti (2008) show how left-wing executives tend to delay the launch of privatization programs through a cross-country study on OECD countries over 1977-2002, covering privatizations in the whole national economy. These findings are confirmed by several analyses showing that many privatizations programs encountered dissatisfaction and opposition among citizens and policymakers, where

transactions have been handled corruptly and where privatizations had a negative effect on consumers (Kikeri and Nellis, 2004; Wood, 2004). Other scholars have investigated to which extent ideology determines the design and implementation of privatization programs (Appel, 2000), outlining how right-wing office-holders with re-election concerns design privatization to spread share ownership among domestic voters. Martinez-Gallardo and Murillo (2009), moreover, find interacting effects between rightist partisanship and financial constraints of governments on the regulatory design in the case of the privatization of the Latin-American electricity sector.

As for liberalization, the empirical evidence seems to reach similar conclusions. Duso (2002) studies entry liberalization in the telecommunications industry in the 1991-1997 period and finds that left-wing governments liberalize less than right-wing governments. Corroborating evidence is provided by Pitlik (2007), which performs a cross-country analysis over the 1970-2000 period and obtains that left-wing executives are less favorable towards liberalization, using an index of market-friendliness of national policies. Potrafke (2010) analyzes 21 OECD countries over the 1980-2003 period and estimates the impact of government ideology on both privatization and liberalization of network industries as two independent and aligned items of deregulation programs; he performs and equation-by-equation estimation and suggests that, again, right-wing governments are more likely associated to both privatization and liberalization initiatives.

The basic assumption behind this empirical literature is that privatizations and liberalizations are two independent and aligned policies. Based on this underlying assumption, existing empirical studies estimate the political determinants of deregulation through one-equation models, in which privatizations and liberalizations are considered separately in unrelated regression equations.

However, this empirical strategy contrasts with those theories showing distinct rationales and alternative outcomes for, respectively, liberalization and privatization initiatives, suggesting the emergence of an economic trade-off between the two policies (De Fraja, 1991, 1994; Newbery, 2002, 2004; Levy and Spiller, 1996; Stiglitz, 1999; Armstrong and Sappington, 2006). Several scholars have in particular analyzed the above trade-off between the two policies relative to their speed, timing and sequencing (Roland, 1994, 2008; Fink *et al.*, 2002; Wallsten, 2001, 2002; Li and Xu, 2004; Bagdadioglu and Cetinkaya, 2010). The dependence between market-oriented policies is discussed, among others, by Harrington (1993), Martinelli and Tommasi (1997), and Cukierman and Tommasi (1998).

De Fraja (1991, 1994), more specifically, shows that privatization and liberalization initiatives tend to influence each other, because competitors' pressure shapes the efficiency gains that a government can expect from privatization, and vice-versa.

Thus, the existing empirical literature remains limited on separate pieces of deregulation policies and tend to neglect the simultaneous determination of privatizations and liberalizations, which theoretical studies deem to be crucial. Moreover, the available empirical work on the political determinants of deregulation is based on data that do not cover, at least, the last 8 years. This might be an important weakness as many deregulation measures, and especially liberalization initiatives in OECD network industries, were undertaken after 2000.

3. Regression analysis

3.1. Data and empirical strategy

In our analysis, contrary to empirical previous literature, we allow for the possibility that privatization and liberalization are jointly chosen. In particular, we estimate two equations (one explaining privatization interventions and one for explaining liberalization interventions) using Seemingly Unrelated Regression (SUR) by Zellner (1962). This method allows us to estimate the two equations simultaneously while accounting for correlated residuals. The correlation between the disturbances of different equations, indeed, is expected to reflect the presence of some unquantifiable factors responsible for the simultaneous determination of privatization and liberalization policies adoption.

In order to perform the empirical analysis we collect data from various sources over the 1975-2007 period. The base sample we use is the largest possible given the data availability (30 countries).[3] Our sample period covers entirely the deregulation wave observed in Western countries in the last three decades through 2007, whereas previous analyses focused on a smaller number of countries and on a shorter period coverage.

[3] Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, South Korea, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

As the dependent variables of our econometric study we consider an index of the intensity of liberalization interventions on a one-year basis (which we call *LiberalizationIntensity* in our empirical analysis) and an index of the intensity of privatization interventions on a one-year basis (which we call *PrivatizationIntensity* in our empirical analysis). To construct such indexes, we use the OECD's (2009) indicators of entry barriers and of public ownership, as – among others – Alesina *et al.* (2005) do. The OECD indicators are based on the *OECD Regulatory Indicators Questionnaire*, which collects information on the ranking of explicit policy settings (see Conway and Nicoletti (2006)) and measures entry barriers and public ownership levels through seven sectoral indicators (which cover: passenger air transport, telecommunications, electricity, gas, post, rail, and road). The sectoral indicators, specifically, measure for each country the strictness of the legal conditions of entry and the extent of public ownership in the companies operating in the considered network industries, which we interpret, respectively, as proxies for sectoral liberalization and privatization. On the one hand, we measure liberalization policy by subtracting the OECD entry barriers index from its maximum value (let us call this variable *LiberalizationLevel*), and then calculate the intensity of liberalization interventions (*LiberalizationIntensity*) by looking at the one-year differences of *LiberalizationLevel*. On the other hand, we measure privatization policy by subtracting the OECD public ownership index from its maximum value (let us call this variable *PrivatizationLevel*), and then calculate the intensity of privatization interventions (*PrivatizationIntensity*) by looking at the one-year differences of *PrivatizationLevel*. We build both *LiberalizationIntensity* and *PrivatizationIntensity* at a sectoral level, so that we can exploit three sources of variation in our estimation: time, country, and sector. Note that the original dataset provided by OECD (2009) does not contain information on public ownership for road industry, thus we do not consider this sector in our analysis, and use information on six sectors (passenger air transport, telecommunications, electricity, gas, post, and rail).

To measure the governments' political ideology, we use data obtained from the Database of Political Institutions (DPI) by World Bank (2009). Information provided by the DPI have been routinely used in cross-country quantitative studies on the political determinants of economic policies (see, for instance, Dutt and Mitra (2005), Krause and Méndez (2005), and Giuliano and Scalise (2009)). Elaborating on the coding provided by the DPI, we construct three dummy variables – which we call *Rightwing*, *Leftwing* and *Centre* in our empirical analysis – that respectively equal 1 if: the government party is defined as

conservative, Christian democratic or right-wing (*Rightwing*); it is defined as socialist, social-democratic, communist or left-wing (*Leftwing*); or it is defined as centrist or does not fit into the two previously mentioned categories (*Centre*).

The adoption of economic policies is likely to be path dependent, with the intensity of policy initiatives at *t* being affected by the intensity of the policy initiatives made at *t-1*. Moreover, the intensity of privatization and liberalization measures is likely to be influenced also by the existing absolute level of both privatizations and liberalizations (e.g., Roland (2008)). To account for such inter-temporal effects, we express *LiberalizationIntensity* and *PrivatizationIntensity* as a function of their one-year lagged values, so including an autoregressive term of order 1 (*AR(1)Term*) in the equations. Furthermore, we consider liberalization and privatization intensity as possibly determined by both one-year lagged liberalization and privatization levels (respectively, *LiberalizationLevel* and *PrivatizationLevel*), in order to control for the absolute level of entry barriers and public ownership that executives find when they are in office.

As legislature-specific control variables, we consider the following characteristics of national governments: *GovHeterogeneity* (this variable is defined as the probability that two deputies picked at random from among the government parties will be of different parties; source: World Bank, 2009), and *Herfindahl* (the sum of the squared seat shares of all parties in the governments, we consider this variable as a proxy of political concentration; source: World Bank, 2009). In this way, we control for the effective lawmaking power of the government and for the executive's capacity to implement economic policies (Roemer, 2001). Finally, we also include a dummy variable for the adoption of the Euro, as suggested by Dang *et al.* (2006), which we call *EuroAdoption* (it equals one if the country adopts the Euro, 0 otherwise; source: authors' coding). Notice that we regress *LiberalizationIntensity* and *PrivatizationIntensity* variables on one-year-lagged covariates (including the political orientation dummies), in order to avoid attributing the adoption of a certain policy measure to an executive just elected; in doing so, we also reduce the possible presence of endogeneity or reverse causality problems in our estimation.

Descriptive statistics of the variables are provided in Table 1. Table 1 shows that, from a descriptive point of view, sectoral liberalization initiatives have a higher average value under left-wing and centre governments, while sectoral privatization initiatives show higher values, on average, under right-wing executives. Moreover, the index of

government heterogeneity has a higher average value under centre and right-wing executives, and the Herfindahl index shows similar values under left-wing and right-wing governments.

TABLE 1. Descriptive statistics.

	Rightwing **[one-year lagged]**		***Centre*** **[one-year lagged]**		***Leftwing*** **[one-year lagged]**	
Variable	**Mean**	**Std.Dev.**	**Mean**	**Std.Dev.**	**Mean**	**Std.Dev.**
LiberalizationIntensity	0.139	0.590	0.109	0.558	0.150	0.622
PrivatizationIntensity	0.081	0.436	0.048	0.270	0.046	0.348
LiberalizationLevel	2.118	2.266	1.423	2.056	2.262	2.343
PrivatizationLevel	2.014	2.276	1.240	1.538	2.036	2.239
GovHeterogeneity	0.251	0.243	0.558	0.183	0.154	0.226
Herfindahl	0.353	0.105	0.245	0.076	0.352	0.103
EuroAdoption	0.089	0.284	0.065	0.247	0.070	0.255

Formally, we consider the two following cross-country cross-sector panel equations:

$$\begin{aligned} \text{'PrivatizationIntensity'}_{i,s,t} = {} & \beta_0 + \beta_1 \text{ 'Rightwing'}_{i,t-1} + \beta_2 \text{ 'Leftwing'}_{i,t-1} + \\ & + \beta_3 \text{ 'PrivatizationIntensity'}_{i,s,t-1} + \beta_4 \text{ 'PrivatizationLevel'}_{i,s,t-1} + \\ & + \beta_5 \text{ 'LiberalizationLevel'}_{i,s,t-1} + \beta_{6\ldots Z} \mathbf{V}_{i,t-1} + \varepsilon_{i,s,t} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{'LiberalizationIntensity'}_{i,s,t} = {} & \beta_0 + \beta_1 \text{ 'Rightwing'}_{i,t-1} + \beta_2 \text{ 'Leftwing'}_{i,t-1} + \\ & + \beta_3 \text{ 'LiberalizationIntensity'}_{i,s,t-1} + \beta_4 \text{ 'LiberalizationLevel'}_{i,s,t-1} + \\ & + \beta_5 \text{ 'PrivatizationLevel'}_{i,s,t-1} + \beta_{6\ldots Z} \mathbf{V}_{i,t-1} + \eta_{i,s,t} \end{aligned} \quad (2)$$

with $t = 1975, 1976, \ldots, 2007$, and where i identifies the country, s identifies the sector, $\mathbf{V}$ is the vector of control variables (which also include a set of industry dummies, in order to control for time invariant specificities of the individual sectors), parameters from β_0 to β_Z, define the parametric structure of the two equations, one-year lagged *PrivatizationIntensity* and *LiberalizationIntensity* on the right-hand side represent the autoregressive term (*AR(1)Term*), and where ε and η are idiosyncratic disturbances that change across countries (i), sectors (s), and years (t), whose correlation is accounted for in our SUR estimation.

The operative sample that we use in the estimation analysis is obtained by using yearly

data on 30 countries observed over the 1975-2007 period. We consider information on sectoral level reforms for six network industries (passenger air transport, telecommunications, electricity, gas, post, and rail), and exclude the road sector, since data on privatization levels for the road industry are not provided in the OECD's (2009) dataset. The OECD's database also shows some missing data for some countries and years. Therefore we finally exploit 4774 observations.

3.2. Estimation results

The estimation results are reported in Table 2. While the first column lists the variables, the remaining columns report the estimated coefficients and standard errors of the *PrivatizationIntensity* and *LiberalizationIntensity* equations.

Table 2. Seemingly unrelated regression: basic model specification.

	SURE MODEL (BASIC SPECIFICATION)			
	PrivatizationIntensity **equation**		*LiberalizationIntensity* **equation**	
Variable	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**
Leftwing	0.010	(0.017)	0.073	(0.026) ***
Rightwing	0.035	(0.016) **	0.017	(0.025)
AR(1)Term	0.072	(0.015) ***	0.071	(0.015) ***
PrivatizationLevel	-0.028	(0.003) ***	0.017	(0.005) ***
LiberalizationLevel	0.023	(0.003) ***	-0.031	(0.005) ***
GovHeterogeneity	-0.022	(0.037)	-0.018	(0.055)
Herfindahl	0.052	(0.086)	-0.333	(0.128) ***
EuroAdoption	-0.030	(0.026)	0.080	(0.039) **
Constant	-0.007	(0.043)	-0.190	(0.064) ***
F-stat for H_0: $\beta(Leftwing) - \beta(Rightwing) = 0$	3.36 *		7.48 ***	
Number of observations	4774		4774	
Fixed effects estimation	yes		yes	
RMSE	0.413		0.612	
F-stat [*p*-value]	11.94 [0.000]		6.08 [0.000]	

Note: * < 0.10, ** < 0.05, *** < 0.01 statistical significance.

The estimation results for the privatization equation show that, being the dummy for

centre governments (*Centre*) the benchmark, the estimated parameter associated to right-wing governments (*Rightwing*) is positive and statistically significant (at 5% level), while that associated to left-wing governments (*Leftwing*) is positive and not statistically significant. Vice versa, the estimation results for the liberalization equation show that, being again the dummy for centre governments the benchmark, the estimated parameter associated to left-wing governments is positive and statistically significant (at 1% level), while the parameter associated to right-wing governments is not statistically significant. We have then performed the Wald test for the null hypothesis of zero difference between the estimated parameters of right-wing and left-wing governments for both the equations. The result of the Wald test show that, for both the equations, such difference is non-null and statistically significant.

These empirical findings unveil that the effect of right-wing executives on sectoral privatizations in the OECD's network industries is positive and greater than that of the left-wing ones, as the existing empirical literature predicts. At the same time, however, they also reveal that the presence of left-wing governments in office does exert a positive effect on the intensity of sectoral liberalizations, which is greater than that associated to the presence of right-wing executives. Thus, both right-wing and left-wing governments are shown to adopt pro-market policies, with respect to centre or non-classifiable governments. However, their ideology (i.e., their political orientation) does affect the 'structure' of the public intervention, right-wing executives implementing a policy mix which favors privatization and left-wing executives implementing a policy mix which favors liberalization.[4]

Besides, the estimation results show that the autoregressive component (*AR(1)Term*) has a positive and statistically significant effect (at 1% level) in both the equations. This suggests that an increase in the intensity of sectoral privatizations does stimulate further sectoral privatization initiatives, and that the same holds for liberalization (i.e. both privatizations and liberalizations are sectoral path-dependent cumulative processes, on average without reversals). Alesina *et al.* (2005) find that the marginal effect of regulatory reforms on investments are higher when intensive deregulation initiatives have been previously implemented; thus, the positive effect of the autoregressive component in our

[4] We are aware of the fact that the political ideology data by World Bank (2009) show some miscoding. In our dataset we have corrected the coding for Italy (for the years 1994 and 1997-2001) and for Hungary (for the years 1999-2002). In unreported estimations, we have also checked that our main results are not driven by the choice of the ideology index, by using the coding provided by Potrafke (2010).

estimation might be due to the attempt by governments to exploit the full potential of given pro-market measures. Moreover, we find that also the absolute levels of liberalization and privatization that executives find in *t-1* are relevant to policy choices in *t*. In particular, our findings show the presence of cross-effects between sectoral liberalizations and privatizations, as a high level of privatization in a certain sector does stimulate further liberalization initiatives in the same sector, while, in a similar way, a high level of sectoral liberalization does foster subsequent privatization (this is showed by the positive effect of *PrivatizationLevel* and *LiberalizationLevel* at *t-1* on, respectively, *LiberalizationIntensity* and *PrivatizationIntensity* at *t*). At the same time, however, when the absolute level of liberalization is high (i.e. the OECD's index of entry barriers is approaching its floor), the intensity of further liberalization initiatives tends to be lower, and the same holds for privatization (this is showed by the negative effect of *LiberalizationLevel* and *PrivatizationLevel* at *t-1* on, respectively, *LiberalizationIntensity* and *PrivatizationIntensity* at *t*).

As for the remaining control variables, we find that the index of political concentration (*Herfindahl*) does exert a negative effect on liberalization intensity, while it seems not to affect privatization intensity, and that the government's heterogeneity (*GovHeterogeneity*) is not associated to a statistically significant parameter in both equations. Finally, Euro adoption (*EuroAdoption*) turns out to have a positive and statistically significant effect on the intensity of liberalization interventions, and to have a not statistically significant effect in the privatization equation.

4. Robustness checks

4.1. Controlling for European policy diffusion

Domestic liberalization choices may be determined by transnational diffusion of public policies. Simmons and Elkins (2005) define policy diffusion as the influence that a policy decision adopted by some countries plays on the choices made by the neighbors. Policy diffusion might be due to rather different mechanisms: policy competition (according to which a domestic policy reduces the benefits of the same policy adoption for others, and increases the relative payoff of the first mover), learning (i.e., governments follow the policy strategies previously adopted by neighbor successful countries), and supranational

institutional drivers (where economic and institutional integration, such as joining the European Union, fosters policy convergence among member countries). Simmons and Elkins (2005), Dang *et al.* (2006) and Pitlik (2007), among others, show empirical evidence corroborating the effect of policy diffusion on the deregulation choices adopted by European governments. Clifton *et al.* (2006) argue that the European integration has been one of the main drivers of EU privatizations. This might be a relevant aspect also in our empirical study, as about 2/3 of our sample's countries joined the European Union.

Here we test whether the effect of governments' political orientation on privatization and liberalization choices we detected is robust to policy diffusion or if it is simply driven by an exogenous clustering of liberal economic practices.

In order to conduct this robustness check of our results, we include two different variables in the equations. First, we consider a dummy variable for the EU membership (*EUMembership*), which equals 1 when the country is a member of the EU, 0 otherwise (source: authors' coding). This variable allows us to account for supranational institutional drivers of deregulation policies. Second, we include the one-year lagged level of privatizations and liberalizations averaged over EU member countries (respectively, *EUPrivatizationLevel* and *EULiberalizationLevel*) as a covariate in, respectively, the privatization and liberalization equation. The two variables *EUPrivatizationLevel* and *EULiberalizationLevel* allow us to account for policy diffusion at *t* induced by policy interventions adopted in EU's countries up to *t-1* (in this way we account for possible policy competition and learning). Descriptive statistics of the additional variables are provided in Table 3.

Now, the two considered equations take the following form:

$$\begin{aligned} \text{'PrivatizationIntensity'}_{i,s,t} = {} & \beta_0 + \beta_1\ \text{'Rightwing'}_{i,t-1} + \beta_2\ \text{'Leftwing'}_{i,t-1} + \\ & + \beta_3\ \text{'PrivatizationIntensity'}_{i,s,t-1} + \beta_4\ \text{'EUPrivatizationLevel'}_{i,s,t-1} + \\ & + \beta_5\ \text{'PrivatizationLevel'}_{i,s,t-1} + \beta_6\ \text{'LiberalizationLevel'}_{i,s,t-1} + \\ & + \beta_{7\ldots K}\,\mathbf{V}_{i,t-1} + \varepsilon_{i,s,t} \end{aligned} \tag{3}$$

$$\begin{aligned} \text{'LiberalizationIntensity'}_{i,s,t} = {} & \beta_0 + \beta_1\ \text{'Rightwing'}_{i,t-1} + \beta_2\ \text{'Leftwing'}_{i,t-1} + \\ & + \beta_3\ \text{'LiberalizationIntensity'}_{i,s,t-1} + \beta_4\ \text{'EULiberalizationLevel'}_{i,s,t-1} + \\ & + \beta_5\ \text{'LiberalizationLevel'}_{i,s,t-1} + \beta_6\ \text{'PrivatizationLevel'}_{i,s,t-1} + \\ & + \beta_{7\ldots K}\,\mathbf{V}_{i,t-1} + \eta_{i,s,t} \end{aligned} \tag{4}$$

with symbols having the same meaning as in equations (1) and (2), and where one-year lagged *PrivatizationIntensity* and *LiberalizationIntensity* on the right-hand side represent, again, the autoregressive term (*AR(1)Term*). Also in this case SUR estimation is performed.

TABLE 3. Descriptive statistics of additional variables.

	Rightwing **[one-year lagged]**		***Centre*** **[one-year lagged]**		***Leftwing*** **[one-year lagged]**	
Variable	**Mean**	**Std.Dev.**	**Mean**	**Std.Dev.**	**Mean**	**Std.Dev.**
EULiberalizationLevel	1.711	1.755	2.282	2.081	1.937	1.754
EUPrivatizationLevel	1.394	1.063	1.646	1.263	1.489	1.063
EuroMembership	0.193	0.395	0.245	0.430	0.293	0.455

The estimation results are reported in Table 4, where the first column lists the variables and the remaining columns report the estimated coefficients and standard errors of the two equations.

From this robustness checks we obtain two interesting results.

First, we find that policy diffusion plays a role in both sectoral privatization and liberalization choices of governments. Indeed, on the one hand, one-year lagged levels of privatization and liberalization (averaged over EU members) act as positive and statistically significant stimulus on the intensity of, respectively, privatization and liberalization interventions of countries, so corroborating the argument of possible policy competition and learning effects (as discussed by Simmons and Elkins (2005)). On the other, to be a EU member is associated to a positive and statistically significant effect in both the privatization and liberalization equation; this confirms the presence of supranational institutional drivers of deregulation policies (as suggested by Pitlik (2007).

Second – and more importantly – notwithstanding the statistically significant relevance of policy diffusion effects, our findings on the political determinants of privatization and liberalization do not change. In fact, the estimated parameter for right-wing governments remains positive and statistically significant in the privatization equation, while the estimated parameter for left-wing governments remains positive and statistically significant in the liberalization equation. Again, moreover, the results of the Wald test for

the null hypothesis of zero difference between the estimated parameters of right-wing and left-wing governments confirm that such difference is non-null and statistically significant for both the equations.

Table 4. Seemingly unrelated regression: controlling for European policy diffusion.

	SURE MODEL (EU POLICY DIFFUSION)			
	PrivatizationIntensity **equation**		*LiberalizationIntensity* **equation**	
Variable	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**
Leftwing	0.014	(0.017)	0.071	(0.026) ***
Rightwing	0.043	(0.016) **	0.039	(0.024)
AR(1)Term	0.065	(0.015) ***	0.077	(0.014) ***
PrivatizationLevel	-0.030	(0.003) ***	0.016	(0.005) ***
LiberalizationLevel	0.007	(0.004) *	-0.081	(0.006) ***
EUPrivatizationLevel	0.048	(0.010) ***		
EULiberalizationLevel			0.072	(0.008) ***
GovHeterogeneity	-0.013	(0.037)	0.005	(0.054)
Herfindahl	0.121	(0.086)	-0.121	(0.127)
EUMembership	0.038	(0.016) **	0.124	(0.024) ***
Constant	-0.046	(0.043)	0.071	(0.063)
F-stat for H_0: $\beta(Leftwing) - \beta(Rightwing) = 0$	4.50 **		2.57 *	
Number of observations	4774		4774	
Fixed effects estimation	yes		yes	
RMSE	0.411		0.603	
F-stat [*p*-value]	13.67 [0.000]		16.24 [0.000]	

Note: * < 0.10, ** < 0.05, *** < 0.01 statistical significance.

In conclusion, the effect of governments' political orientation on privatization and liberalization choices we detected is not driven by the presence of policy diffusion.

4.2. Controlling for outlier values.

Countries included in our sample might show outlier values in their deregulation outcomes and institutional characteristics. Thus, here we test whether outlier values influence the statistical relevance of our estimation results. Specifically, we estimate the two equations using a 'jackknife' variance estimator. The use of the 'jackknife' variance

estimator permits a cross-validation process, that helps to detect the possible relevance of influential outliers to the estimation results. In the 'jackknife' estimate the sample of size n is divided in g groups of size m (where $m = n - k$). The estimate of each parameter is computed g times, by ignoring the generic j-th group in each round. The overall parameter estimate is then obtained as the average of the g parameters. In this robustness check we consider the model specification in which controls for policy diffusion are included.

Table 5. Seemingly unrelated regression: robustness check for outliers.

	SURE MODEL (JACKKNIFE ESTIMATION)			
	PrivatizationIntensity **equation**		*LiberalizationIntensity* **equation**	
Variable	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**
Leftwing	0.014	(0.015)	0.071	(0.025) ***
Rightwing	0.043	(0.015) ***	0.039	(0.023) *
AR(1)Term	0.065	(0.020) ***	0.077	(0.015) ***
PrivatizationLevel	-0.030	(0.004) ***	0.016	(0.005) ***
LiberalizationLevel	0.007	(0.005)	-0.081	(0.007) ***
EUPrivatizationLevel	0.048	(0.015) ***		
EULiberalizationLevel			0.072	(0.009) ***
GovHeterogeneity	-0.013	(0.031)	0.005	(0.046)
Herfindahl	0.121	(0.085)	-0.121	(0.099)
EuroMembership	0.038	(0.019) **	0.124	(0.030) ***
Constant	-0.046	(0.038)	0.071	(0.052)
F-stat for H_0: β*(Leftwing)* - β*(Rightwing)* = 0	4.06 **		2.68 *	
Number of observations	4774		4774	
Fixed effects estimation	yes		yes	
RMSE	0.411		0.603	
F-stat [*p*-value]	13.67 [0.000]		16.24 [0.000]	

Note: * < 0.10, ** < 0.05, *** < 0.01 statistical significance.

Table 5 reports the results obtained through a SUR 'jackknife' variance estimator. Parameter estimates are shown to be stable with respect to the possible influence of outlier values. In particular, the estimation results show that the estimated parameter associated to right-wing governments is positive and statistically significant (at 1% level) for the privatization equation, and that the estimated parameter associated to left-wing governments is positive and statistically significant (at 1% level) in the liberalization

equation. The difference between the estimated parameters of right-wing and left-wing governments is confirmed by the Wald test to be non-null and statistically significant for both the equations. This validates the statistical robustness of our main findings to outlier values.

4.3. Controlling for government's stability.

As an additional robustness check, we also test whether political stability – measured by the executive control of the lawmaking houses and by the number of years both the executive has been in office and left in the current term – does affect liberalization and privatization initiatives. The effect of political stability on economic policy has been detected empirically in several spheres of the macroeconomy. For example, Alesina *et al.* (2006) find that the number of years left in the current term increases the likelihood of fiscal adjustments that reduce budget deficit, and, more recently, Roe and Siegel (2011) show that political stability positively affects financial market development. Similarly, with respect to the regulation policy domain, Fredriksson and Svensson (2003) show that political instability induces sub-optimal governmental interventions in environmental policy formation, and Chang and Berdiev (2011) observe that the number of years the executive has been in office positively influence pro-market policies in the regulation of the energy industries. As Spiller (2006) argues focusing on the utility sector, the connection between a government's political commitment and its regulation decision-making lies on the institutional costs of reducing the value of the incumbent's investments. Specifically, Spiller explains that regulatory policies might be influenced by the government's horizon, because it affects the executive's concern for increasing reputation, meeting the needs of key constituencies, achieving re-election, etc.

Since the average stability of governments could be different between left-wing and right-wing ones, we run an additional estimation including three control variables for the executive's stability, in order to further check the statistical robustness of our empirical findings. We consider a dummy variable that equals 1 when the party of the executive has an absolute majority in the houses that have lawmaking powers (*HousesMajority*), the number of years the chief executive has been in office (*YearsInOffice*), and the number of years left in the current term (*YearsLeftTerm*). These three variables are obtained from World Bank (2009). Their descriptive statistics are provided in Table 6.

TABLE 6. Descriptive statistics of additional variables.

	Rightwing [one-year lagged]		*Centre* [one-year lagged]		*Leftwing* [one-year lagged]	
Variable	**Mean**	**Std.Dev.**	**Mean**	**Std.Dev.**	**Mean**	**Std.Dev.**
HousesMajority	0.266	0.442	0.126	0.332	0.282	0.450
YearsInOffice	4.019	3.038	3.178	2.277	3.801	2.786
YearsLeftTerm	1.649	1.306	1.841	1.375	1.668	1.305

The model to be estimated is given by equations (1) and (2), where the vector of control variables **V** includes one-year lagged *HousesMajority*, *YearsInOffice* and *YearsLeftTerm* as additional covariates.

The regression results are reported in Table 7.

Table 7. Seemingly unrelated regression: robustness check for government's stability.

	SURE MODEL (GOVERNMENT'S STABILITY)			
	PrivatizationIntensity **equation**		*LiberalizationIntensity* **equation**	
Variable	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**
Leftwing	0.009	(0.017)	0.070	(0.026) ***
Rightwing	0.031	(0.017) *	0.014	(0.025)
AR(1)Term	0.070	(0.015) ***	0.071	(0.015) ***
PrivatizationLevel	-0.028	(0.003) ***	0.018	(0.005) ***
LiberalizationLevel	0.022	(0.003) ***	-0.031	(0.005) ***
GovHeterogeneity	-0.009	(0.038)	-0.019	(0.056)
Herfindahl	0.045	(0.093)	-0.380	(0.138) ***
HousesMajority	0.015	(0.016)	0.024	(0.024)
YearsInOffice	0.005	(0.002) ***	0.001	(0.003)
YearsLeftTerm	0.008	(0.004) *	-0.008	(0.007)
EuroAdoption	-0.038	(0.026)	0.077	(0.039) *
Constant	-0.046	(0.046)	0.213	(0.068) ***
F-stat for H_0: β*(Leftwing)* - β*(Rightwing)* = 0	2.70 *		7.66 ***	
Number of observations	4757		4757	
Fixed effects estimation	yes		yes	
RMSE	0.413		0.613	
F-stat [*p*-value]	10.33 [0.000]		5.06 [0.000]	

Note: * < 0.10, ** < 0.05, *** < 0.01 statistical significance.

We find that both the number of years the executive has been in office (*YearsInOffice*) and the number of years left in the current term (*YearsLeftTerm*) have a positive effect on privatization intensity, while they seem not to affect liberalization intensity. Nonetheless, the estimated parameter for right-wing governments and that for left-wing governments, again, are positive and statistically significant respectively in the privatization and liberalization equation. This further sustains the possible existence of causal effects behind the relationship between political orientation of governments and privatization and liberalization policy interventions that we observed.

5. Conclusion

In this paper we have shown how political parties in office result influencing the liberalization-privatization path of a country according to their ideological bias. We find, contrary to conventional wisdom, that right-wing governments privatize to a greater extent and liberalize to a lesser extent than left-wing executives. Furthermore, we show that this empirical result is robust to the presence of cross-effects between liberalizations and privatizations, to the sectoral path-dependency in the policy adoption, and to policy diffusion among European countries. Our findings, based on the latest data relative to six network industries of 30 OECD countries from the Seventies to 2007, strongly contrast with the previous empirical literature arguing for an analogous treatment of liberalization and privatization policies by political parties. According to this literature, right-wing governments do promote both policies, whereas left-wing parties oppose to them. Our results partially reverse conventional wisdom, and suggest a much more complex dynamics surrounding the structure of deregulation in network industries.

One of the main theoretical consequences of our investigation is that the measurement of political determinants of market-oriented policies in network industries should disentangle liberalization and privatization, being these policies two distinct – although interdependent – tools for promoting market deregulation, with different economic consequences. Political parties in office reveal, indeed, quite opposite preferences towards the combination of the two policies considered and systematically tend to re-direct the country's liberalization-

privatization path towards the desired pattern.[5]

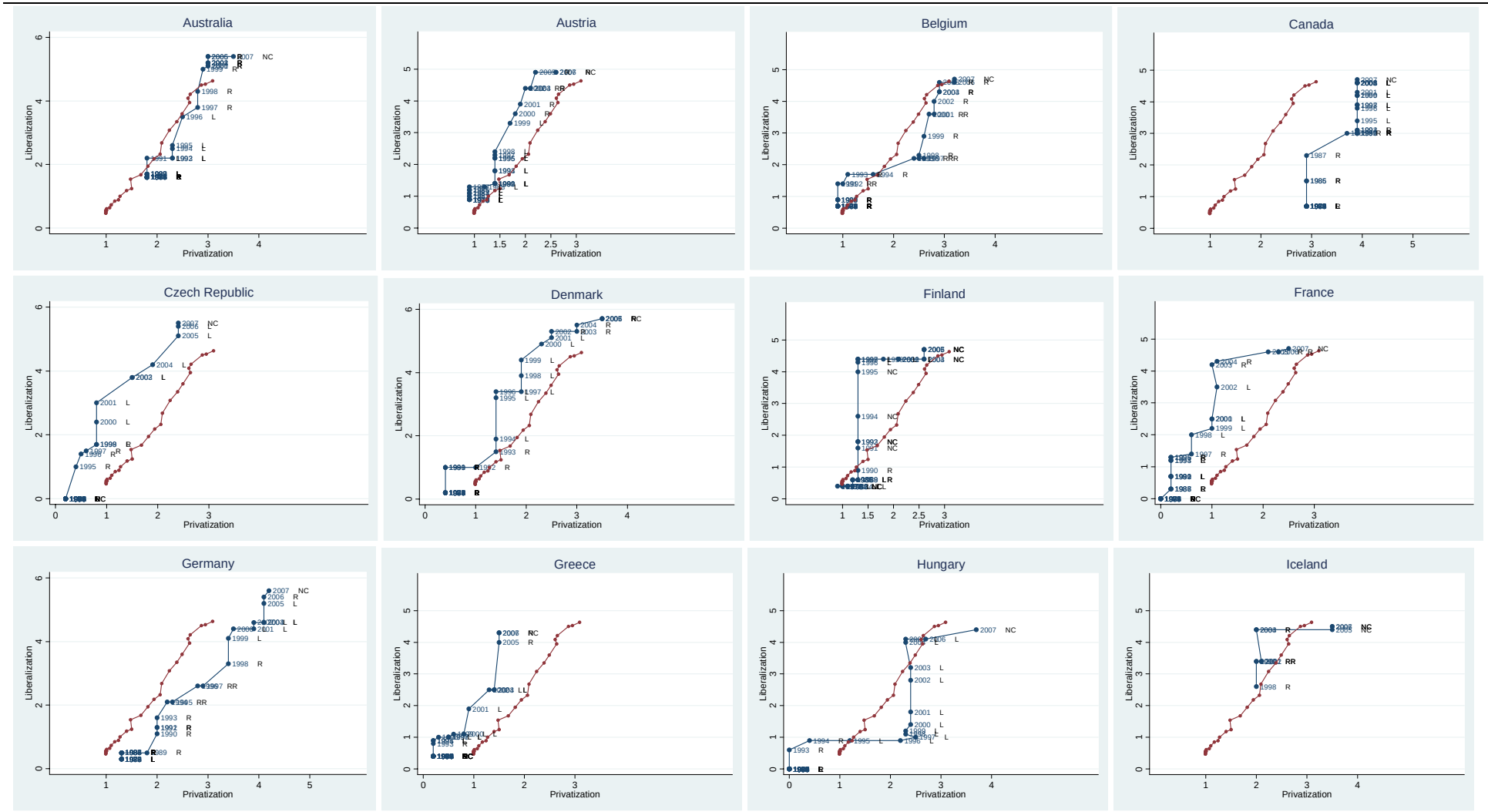
Our conclusion may shed new lights in the political economy literature on deregulation policies, as it outlines a sort of 'politically-determined' trade-off between privatization and liberalization, so-far neglected in the related literature. On the one side, the 'pro-market' paradigm of right-wing parties does not necessarily involve the same level of intensity along the vast array of market-oriented policies. According to our findings, right-wing parties seem to promote a privatization-biased pattern. As Gual and Jodar-Rosell (2009) recently pointed out, this might be due to the belief that quasi-monopolistic rents induce credible economic restructuring of formed State–owned enterprises and thus assure the success of privatization programs. Lipezynski *et al.* (2001), furthermore, argue that right-wing governments tend to give priority to the State's size reduction, and tend to use privatization programs as a mean for financing tax cuts. On the other side, the circumstance that left-wing governments result coupling market liberalization with State control of incumbent firms may reveal a persistent aversion towards a full decentralized market economy and a political favor towards economic restructuring through incentives provided by competition, perhaps delaying privatization after liberalization reaches a critical threshold (Stiglitz, 1999). This recent pro-market attitude of left-oriented executives is largely acknowledged today by those political scientists who define as 'second-wave neo-liberalism' the phenomenon of the embracement of the neoliberal ideal of entrepreneurship by social democratic parties in Europe and North America (Roy *et al.*, 2006; Steger and Roy, 2010). Our empirical results are consistent with this argument. The liberalization of network industries may thus differ from other market-oriented policies in terms of its political appeal and rationale, as it may represent a politically sustainable way for left-wing executives to indirectly redistribute rents towards final low-income worker-customers and to grant universal access obligations and minimal level of quality (Armstrong and Sappington, 2006; Alesina and Giavazzi, 2007).

The analysis of the political economic rationale behind the ideologically oriented deregulation paths we find is far beyond the scope of our paper. Nonetheless, we believe that the empirical picture we have outlined raises new issues on the political determinants of market-oriented policies, which deserve further theoretical and empirical research.

[5] In the Appendix we provide a panel of graphics showing liberalization-privatization patterns for each country considered in our empirical study.

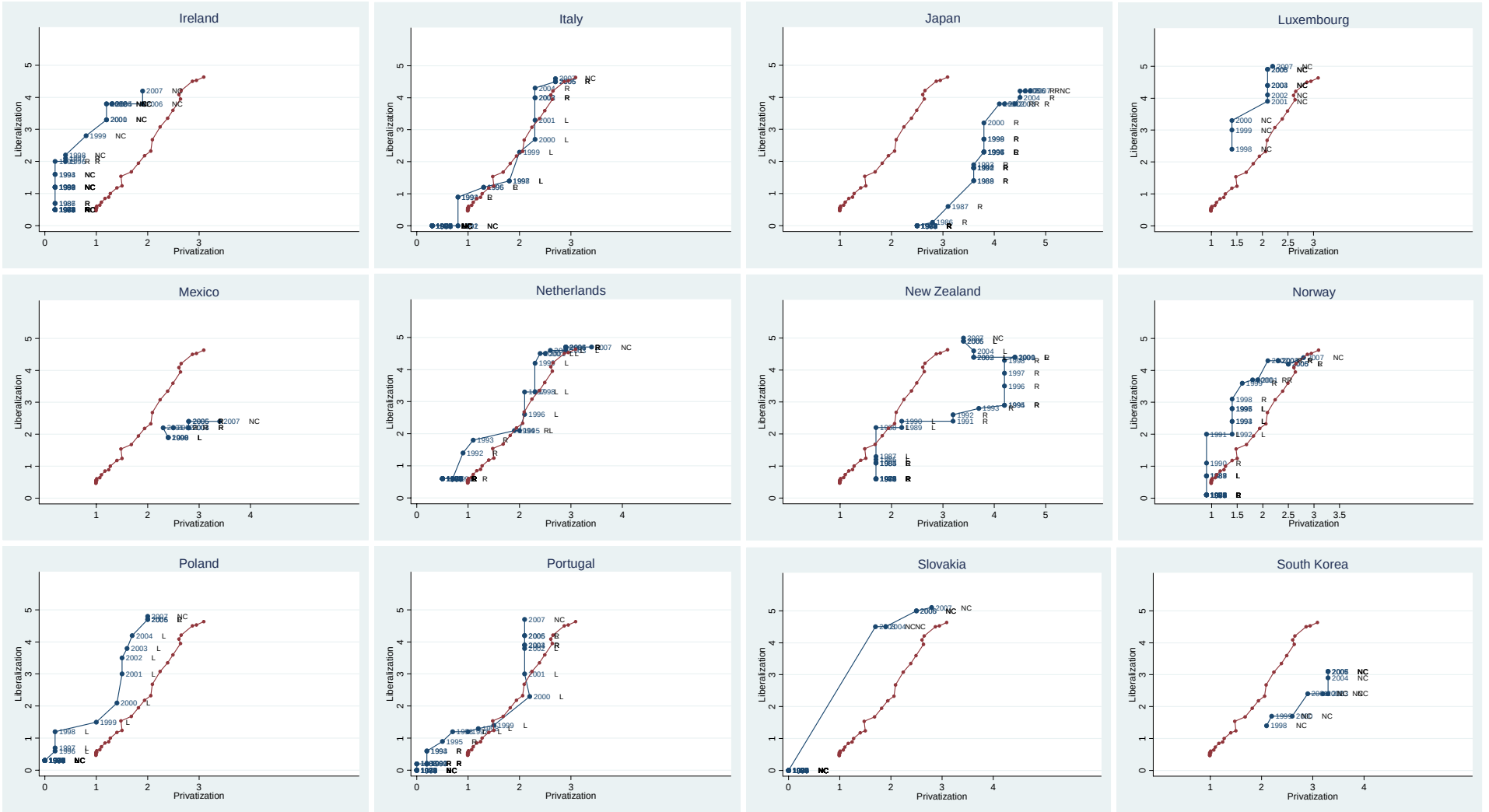
APPENDIX

FIGURE 2. Liberalization and privatization in OECD countries (network industries, 1975-2007): L = left-wing, R = right-wing, NC = centre and non-classifiable (source: elaboration from OECD (2009) and World Bank (2010)). The red line indicates the OECD average.



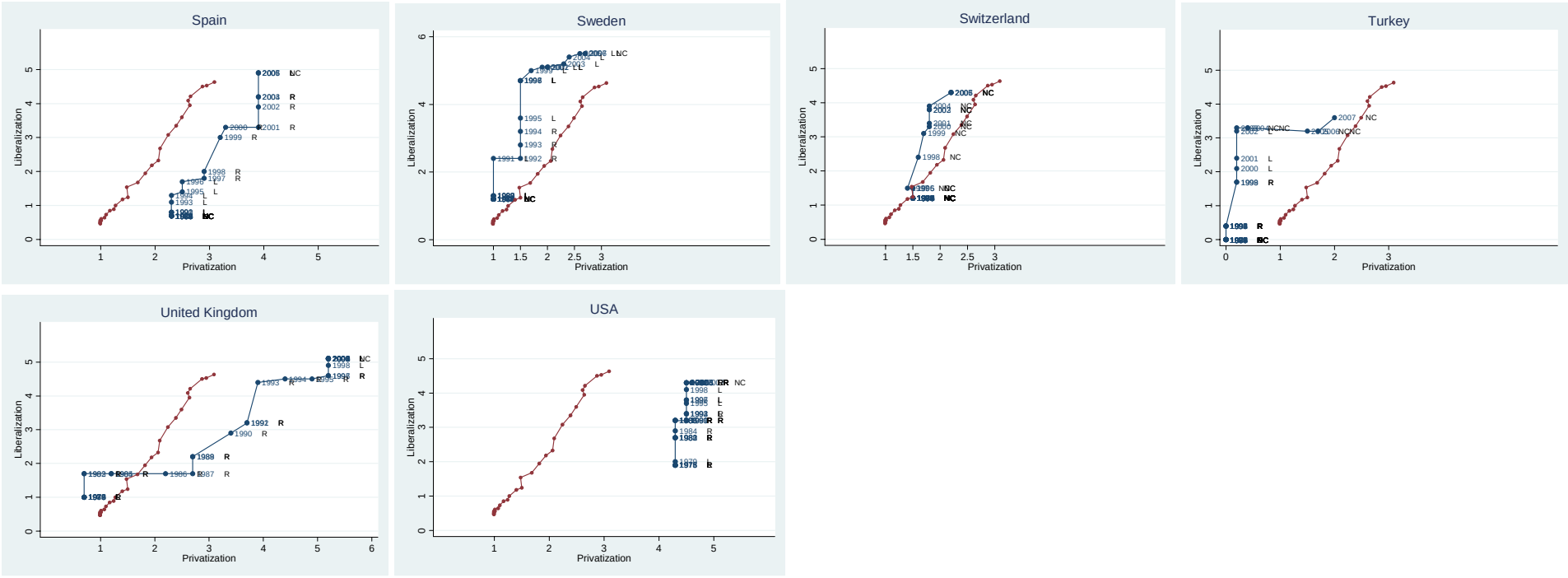
Note: liberalization is measured by subtracting the OECD's (2009) indicator of entry barriers to its maximum value, privatization is measured by subtracting the OECD's (2009) indicator of public ownership to its maximum value (both indexes range from 0 to 6).

FIGURE 2. *(Continued)*



Note: liberalization is measured by subtracting the OECD's (2009) indicator of entry barriers to its maximum value, privatization is measured by subtracting the OECD's (2009) indicator of public ownership to its maximum value (both indexes range from 0 to 6).

FIGURE 2. *(Continued)*



Note: liberalization is measured by subtracting the OECD's (2009) indicator of entry barriers to its maximum value, privatization is measured by subtracting the OECD's (2009) indicator of public ownership to its maximum value (both indexes range from 0 to 6.

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