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# **Explaining Telecoms and Electricity Internationalization in the European Union: A Political Economy Perspective**

Judith Clifton and Daniel Díaz-Fuentes and Julio Revuelta

Universidad de Cantabria, Spain

2009

Online at <http://mpa.ub.uni-muenchen.de/33037/>

MPRA Paper No. 33037, posted 31. August 2011 09:11 UTC

## **THE POLITICAL ECONOMY OF TELECOMS AND ELECTRICITY INTERNATIONALIZATION IN THE SINGLE MARKET**

Judith Clifton, Daniel Díaz-Fuentes and Julio Revuelta López

*As a consequence of liberalization policies in the European Union (EU), a number of formerly inward-looking incumbents in telecommunications and electricity successfully transformed themselves into some of the world's leading Multinationals. The precise relationship between liberalization and incumbent internationalization, however, is contested. This article tests three persuasive arguments derived from the political economy literature on this relationship. The first claims that incumbents most exposed to domestic liberalization would internationalise most. The second asserts the opposite: incumbents operating where liberalization was restricted could exploit monopolistic rents to finance their aggressive internationalisation. The third argument claims that a diversity of paths will be adopted by countries and incumbents vis-à-vis liberalization and internationalization. Using correlation and cluster analysis of the whole sample of EU telecoms and electricity incumbent Multinationals, evidence is found in favour of the third hypothesis. Internationalization as a response to liberalization took diverse forms in terms of timing and extent and this is best explained using a country, sector and firm logic.*

Key words: electricity, European Union, internationalization, liberalization, telecommunications.

## 1. INTRODUCTION

It was only from the 1980s that the European Commission (EC) started to embark seriously on forging market integration in the network industries, particularly in telecommunications and electricity, despite the fact it had enjoyed significant legal competence in the field since the Treaty of Rome.<sup>1</sup> The new, liberalized policy environment which gradually extended over these two sectors substantially changed the business options available to incumbents. In particular, liberalization ‘enabled’ these previously inward-looking domestic incumbents to contemplate, and pursue, expansion abroad. As a consequence of the new policy environment, dozens of incumbents – previously perceived by some politicians as inefficient ‘lame ducks’ fit only for privatization during the new economic policy emerging from the 1980s (Crafts 1991) – rapidly transformed into highly respected, world class Multinational Corporations. Their emergence perhaps provided evidence at last of a new dawn of European ‘international champions’, this time not in the traditional industrial sectors (Hayward 1995), but in the network industries since, though business reached many corners of the globe, the overwhelming bulk of investment was in other EU countries (Clifton, Comín and Díaz-Fuentes 2007). The policies which underlined their emergence could be understood as a response to a concern that European business, including network industries, had to adapt to new technological and competitive challenges from the United States, Japan and beyond. Market integration in the network industries, it was anticipated, would

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<sup>1</sup> Services of General Economic Interest figured in the Treaty of Rome as exceptions to competition policy where this threatened general interest provision. See Clifton, Comín and Díaz-Fuentes (2005).

result in a smaller number of more competitive firms better able to confront global challenges. From the 1990s, a significant number of these incumbents internationalized and now figure not only as some of Europe's but also the world's largest Multinationals. EDF, Telefónica, E.ON, Deutsche Telekom, France Télécom and RWE ranked in the world's top 25 non-financial Multinationals in 2006 (UNCTAD 2008). Fifteen years earlier, none of these firms figured in the top 100 ranking. Given this development, it would appear that European policy-makers met with some success.

Now, liberalization was a 'prerequisite' of incumbent internationalization, because it reduced or removed previous restrictions on investment and ownership across borders. Internationalization would not have been prioritised or even permitted when nationalized incumbents were domestic monopoly public service suppliers. However, the *precise* relationship between incumbents' internationalization and liberalization is highly contested. Considerable tension has been generated around the perception that some incumbents embark on aggressive internationalization strategies in other countries which are relatively more exposed to liberalization - even daring to take over 'their' national 'jewel in the crown' - whilst the 'aggressors'' home governments delay or restrict liberalization in that sector. While this perception could generate disquiet in any industry, it is particularly alive in energy and communications, which have long been considered of national strategic, economic and social importance. Indeed, far from their strategic role becoming obsolete in the twenty-first century, new modes of terrorism have used network industries to organise (communications) and deliver (transportation and postal services) terror. For market integration to be successful, it is essential that a level-playing field is created and that it is perceived that all players stick to the rules of the game. To this end, common liberalization deadlines are set, and the EC uses various

disciplinary instruments to ‘punish’ non-compliers. The problem of ‘asymmetric behaviour’ has been partially addressed in the drafting of the new electricity directive (EC 2009) through the so-called ‘Gazprom clause’ which stipulates prospective acquisitions by vertically integrated firms can be blocked if the target incumbent has unbundled. In practice, liberalization as a process is rarely implemented identically in different settings: the way that policy is understood, and the speed and depth of its implementation, invariably differ. Political economists ascribe the different ways in which a policy such as liberalization is implemented on the ground to the various and multiple pressures States receive from businesses, trade unions, NGOs, as well as the extent to which the State can respond (Smith 2001; Thatcher 2001; Henisz and Zelner 2006). Purposeful delay - or the *perception* of purposeful delay – could bring market integration to a stand-still (‘why should we open up, with all the political headaches it involves, if they aren’t?’).<sup>2</sup> Thus, the question of States’ and firms’ responses to liberalization cuts to the heart of the political economy of the integration process.

There are several persuasive arguments in the political economy literature on the relationship between internationalization and liberalization. Three main approaches will be tested here. The first argument underlines the logic of EC policy in this field: sectoral liberalization leads to the erosion of the incumbents’ market share, exposing managers to the ‘cold winds’ of international competition. Fearful of being left behind in the ‘race’ to internationalization - investment opportunities are limited in these sectors - managers are pressurised to exploit firm economies of scale and know-how in new or more lucrative markets abroad. So, *faster, deeper liberalization at home is associated*

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<sup>2</sup> This tension was expressed during interviews by the authors with national regulators during July 2008.

*with greater incumbent internationalization.* The second argument is less optimistic: incumbent managers, faced by the challenges presented by liberalization, will lobby government to restrict or delay liberalization at home whilst, simultaneously, exploit opportunities opened up by relatively earlier liberalizing countries abroad. High-risk business abroad is supported by ‘softer touch’ liberalization, so *greater incumbent internationalization is associated with slower and partial liberalization.* The third argument is more influenced by comparative political economy literature. Liberalization is met by rational behaviour of States and firms but, because institutions matter, the processes of liberalization will differ. Internationalization, made possible by liberalization, will be pursued via different strategies, according to institutional circumstances so, *national and sectoral responses to liberalization will result in various internationalization responses, explained by institutional difference; even if different paths are taken towards a similar end point.*

Building on a body of scholarship on telecommunications and electricity reform (Börsch 2004, Eising 2002, Haar and Jones 2008, Héritier 2002, Murillo 2009, Thatcher 2001, 2007, Van Kranenburg and Hagedoorn 2008) this article analyses the role of liberalization policy in explaining incumbent internationalization outcomes in telecommunications and electricity in the EU. Correlation and cluster analysis methodology is deployed to analyse all major telecoms (12) and electricity (17) Multinationals in the EU plus Norway.<sup>3</sup> Analysis of these two sectors is justified because: of their role in economic growth; they provide critical networks for the movement of knowledge and energy required by the Single Market; they still constitute

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<sup>3</sup> Single market rules apply to Norway as a member of the European Economic Area.

See Bartle (2006).

important instruments of the State; and, finally, they constituted key sectors in the privatization and liberalization ‘wave’ during the 1990s. After multiple rounds of liberalization, it appears much work is left to be accomplished in telecommunications and, particularly, electricity, before the Single Market could be understood to be nearing completion (Ilzkovitz *et al.*, 2008). In July 2009, the EC ruled E.ON and Gaz de France-Suez had participated in ‘market sharing’, fining them 553 million each. Previously, in 2007, Telefónica was forced to pay 152 million euros when the EC ruled it had set unfair prices. There are, of course, many other issues that do not end up in highly publicised sanctions.

Deeper insight into the role played by liberalization policy in the internationalization of incumbents can shed new light on the political economy of market integration. It is found here that no causal relationship exists between incumbent internationalization and liberalization. Liberalization and internationalization changed the opportunity sets available for EU incumbents and their governments, but ‘policy space’ matters. Policy space is a fast-moving zone where States and firms ‘embrace’, ‘balk’ or ‘limp forward’. Some of the larger players moved aggressively to ‘swallow up’ smaller or less-convinced market players, in a West-East and North-South direction. Diversity is encountered, at the country, sectoral and, particularly, firm level. Decisions taken inside policy space can have long-lasting consequences on the ways in which the economy is structured.

The rest of the article is organized as follows. The second section presents the three main arguments on the relationship between incumbent internationalization and liberalization and derives hypotheses for competitive testing. The third section

operationalizes the hypotheses and synthesizes the research design. The fourth section provides data on the major EU telecoms and electricity incumbents including internationalization. The fifth part contains the analysis divided into two sub-sections, telecommunications and electricity. Conclusions follow.

## **2. THREE HYPOTHESES ON THE ROLE OF LIBERALIZATION ON INCUMBENT INTERNATIONALIZATION**

There is a vast literature in the social sciences on why firms internationalize. It is a daunting task to summarise this literature; here, three main points will be made about the state-of-the-art literature in order to contextualise the more specific political economy literature which deals with the role of policy on internationalization. It is first important to remember that most research on why firms went abroad focused on the manufacturing, oil and financial sectors, reflecting the profile of most twentieth-century Multinationals. Logically, much less attention has been paid to why firms in network industries go abroad, so their recent internationalization is presenting new research challenges (UNCTAD 2008, Jakopin 2008). Secondly, the reasons why a firm goes abroad are complex and interwoven, and cannot usually be reduced to a single factor. Theories or paradigms developed to explain firm internationalization take in multiple variables. Despite differences across schools of thought on international business, one particularly influential perspective was developed by John Dunning (1989). Briefly, the ‘OLI’ paradigm locates reasons for internationalization in ‘O’ (firm-specific advantages), ‘L’ (country specific advantages) and ‘I’ (internalization). Thirdly, scholars are increasingly recognising the role of policy and other institutional factors as variables in the internationalization decision, after having been rather neglected



(Dunning 2009; Spar 2001). Policy considerations would fit broadly into 'L', since differences in the timing, extent and quality of policies such as liberalization implemented in the home and host country constitute part of the business environment in which firms operate. Policy is arguably an even more important factor influencing internationalization in the so-called 'heavily regulated' network industries. Telecoms and electricity incumbents did not have international presence to speak of at the beginning of the 1990s, and regulatory change, including liberalization, 'enabled' this internationalization to occur. Attention is now turned to how the relationship between liberalization policy and incumbent internationalization is conceptualised in different strands of political economy literature in order to derive the hypotheses.

The first two hypotheses are based on political economy arguments. The first argument underlies the logic of the Single Market project, as detectable in thousands of EC policy documents.<sup>4</sup> It is also the view expressed by network industry managers in a world-wide survey on internationalization drivers (UNCTAD 2008) as well as other academic accounts (Stienstra *et al.*, 2004). Liberalization at the sectoral level forces incumbents to react and readjust. They increasingly notice how their monopolistic markets are being challenged by new entrants, resulting in a decline of their business. They also fear that a failure to liberalize domestically will compromise any potential outward expansion, due to reciprocity demands, meaning delay could prevent them from entering the internationalization 'race'. Firms that embrace liberalization will be freer to seek out better, more profitable business abroad, exploiting their economies of scale. Macro policy reform has a direct impact on firm behaviour, therefore, which is assumed to be

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<sup>4</sup> Neelie Kroes (2005), Commissioner for Competition explained: 'Companies that face strong competition at home are more likely to become successful on a global scale'.

rational, uniform and profit-seeking. This perspective is ‘generalistic’ since attention is focused on the transformative power of policy and anticipates a common response from firms. Little attention is paid to institutional or firm-based differences. It is also ‘optimistic’, since it anticipates liberalization will have a uniform, lineal path, from design to outcome. If firms, States or both attempt to oppose liberalization, supervisory and disciplinary instruments can be used to ensure compliance by the EC. This narrative represents the ‘hope’ of policy-makers: competitive markets will drive down prices thus providing consumers with better services at lower cost. Thus, *hypothesis 1 claims that the greater a firm is exposed to earlier and deeper liberalization, the more that firm will respond to increased pressure on its domestic market by increasingly going abroad in search of markets.*

Another reading from political economy predicts a different outcome from which the second hypothesis is derived (Bonardi 2004; Chari and Gupta 2008, Haar and Jones 2008, Sarkar et al. 1999). In common with the first approach, liberalization is understood as being an important factor when explaining internationalization patterns of network industries; firms and States are understood to behave rationally and uniformly; institutional aspects are downplayed. The crucial difference is in the *direction* of the linkage between internationalization and liberalization. In a battle for survival, as liberalization quickens and deepens, firms, sometimes supported by their States, will seek to avoid or restrict liberalization at home. ‘National champion’ policies are a case in point: governments may opt to ‘cushion’ national players from the onset of a potentially damaging policy in order to shore up valued political support. Highly publicised examples include Italian Prime Minister Berlusconi’s stated preference to keep Telecom Italia in ‘Italian hands’ and France’s former Prime Minister Dominique de

Villepin's '*patriotisme économique*' pledge to protect eleven 'strategic' industries – including casinos – from foreign takeover.<sup>5</sup> States can deliberately implement liberalization incorrectly, partially or slowly, giving 'breathing time' to domestic players to readjust and exploit other markets which opt to open up earlier. State protection of industry may be even more likely to emerge in industries such as networks, associated historically with the nation in economic, political, strategic and social terms. Protection provides a firm with 'safe' financial resources derived from monopoly rents which can be used to undertake risky international operations. Thus, *hypothesis 2 argues that greater firm internationalization is associated with relatively slower and limited implementation of liberalization.*

The third hypothesis is influenced by the comparative political economy and institutionalist literature (Hall and Soskice 2001) which focuses on reform in these sectors (Börsch 2004, Levi-Faur 2006, Murillo 2009, Thatcher and Héritier 2002). The most nuanced of these accounts is Thatcher (2007). This adopts a policy analysis approach and argues different paths to reform, explained by institutional differences, may eventually lead to relatively similar outcomes. In common with the other two perspectives, it is assumed that liberalization is important and firms and States act rationally. Institutional and geopolitical differences, however, matter, and significantly shape processes and outcomes, hence countries and sectors may embark on different paths towards a similar reform direction. So, *hypothesis 3 claims that governments and firms responded in various rational ways to liberalization, incumbent internationalization being one of those responses, and these differences of timing and*

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<sup>5</sup> *Times* 18 April 2007

*extent can be explained by institutional differences even if some convergence is finally attained.*

Testing these three hypotheses is the central aim of this article. However, there are two secondary questions that require brief attention: ownership and firm size. Liberalization has often been confused with privatization. These two policies are conceptually quite different, since liberalization entails introducing competition, whilst privatization means more private ownership. Whilst the EC has competence in liberalization policy, it is up to national governments to implement privatization (Clifton, Comín and Díaz-Fuentes 2006). Did privatization influence internationalization? It could be argued that more privatization makes a company more visible to its stock-holders, forcing it to be efficient and maximise profits, whilst cutting its political ties make the firm more agile to move (Megginson and Netter 2001). Thus, *the greater a firm is privatised, the more likely that firm is to respond to increased pressure on its domestic market by seeking out more profitable markets abroad (hypothesis 4)*. In many ways, hypothesis 4 is the corollary of hypothesis 1, in that greater liberalization and deeper privatization form part of the reform of the network industries so are seen as going hand in hand. The opposite of this argument is the corollary to hypothesis 2. Mergers and Acquisitions are often once-off, risky and politically complex operations: board-room politics often becomes transformed into ‘high politics’ when potential gains are significant. Incumbents with significant political involvement may be at an advantage in that they could have access to more information as well as to politicians who could ‘smooth the way’ for the operation to take place. Following this logic, firms with significant public ownership may be more likely to internationalize more strongly, thanks to interference from a political ‘visible’ hand. *Thus, less privatization should be correlated to more*

*internationalization (hypothesis 5)*. Finally, firm size could be an important factor enabling firm internationalization. For instance, there may be a minimum size that firms need to reach before internationalization becomes possible. Hence, firm size is a control variable throughout the analysis.

### **3. RESEARCH DESIGN**

Four hypotheses predict a lineal and continuous relationship between internationalization and liberalization policy (1 and 2), and internationalization and privatization (4 and 5), albeit in different directions. If hypothesis 1 is correct, we would expect to find correlations between higher levels of firm internationalization with deeper and faster implementation of liberalization, in its multiple forms. Hypothesis 2 is correct if restricted and more sluggish liberalization implementation was correlated with greater incumbent internationalization. As regards internationalization and ownership, hypothesis 4 predicts that more privatization will be correlated with greater internationalization, and hypothesis 5, less privatization would be correlated with greater internationalization. Incumbent size is controlled for throughout. Correlational analysis measures the strength of the associations between the independent and dependent variables, thus is appropriate to test these hypotheses. Hypothesis 3, in contrast, predicts that there is no fixed relationship between the variables; rather, there will be multiple paths in terms of the timing and extent towards incumbent internationalization and liberalization, which can be explained by institutional differences. Cluster analysis is ideal for testing this, since patterns of incumbent behaviour are made visible.

#### **4. A ‘SNAPSHOT’ OF RECENT INTERNATIONALIZATION OF EU TELECOMS AND ELECTRICITY INCUMBENTS**

Before proceeding to competitively test the hypotheses on the relationship between incumbent internationalization and liberalization, a sketch of the internationalization of major EU telecoms and electricity incumbents is provided. Tables 1 and 2 respectively show the major telecoms and electricity Multinationals between 1999 and 2006, ranked by revenue in 2006. The ‘Western bias’ of the integration process can be seen since only major Western European Multinationals emerged, whilst Eastern Member States were generally recipients of this process. Data is provided on the timing and extent of internationalization, liberalization and ownership, revenue and employees. Definitions and measurements of internationalization, liberalization and privatization require explanation. International activity by firms takes two main forms: global alliances or the physical extension of the firms’ sales, assets and/or employees abroad. It is this second activity that has been of greater importance in telecommunications and electricity, so it is this ‘physical’ internationalization that is considered here. Internationalization is quantified as foreign revenues as a percentage of overall revenues.<sup>6</sup> Data on foreign operating revenues is derived from annual company reports and Amadeus (2009). Liberalization is complex to quantify. The OECD (2009) is perhaps the most comprehensive quantitative database of regulation and is used here. OECD

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<sup>6</sup> Methodology deployed by the United Nations Conference on Trade and Development (UNCTAD) constructs a composite proxy of internationalization combining data on sales, employees and assets abroad. When this information is not available, however, data on sales, employment or assets abroad only is used. To avoid possible bias that the UNCTAD approach could cause, we use here ‘only’ data on sales abroad.

methodology constructs different sets of indicators for liberalization in telecommunications and electricity (Conway and Nicoletti 2006). For telecommunications, liberalization is measured in two ways. Firstly, an indicator is constructed for ‘Entry Regulation’, meaning to what extent legal systems allow for new entrants, 0 being they do not, and 1 being completely.<sup>7</sup> The second indicator, ‘Market Structure’, indicates what market share new entrants enjoy, as a means of gauging the extent to which liberalization leads to actual competition. Zero means none and 1 means the total market. For electricity, ‘Entry Regulation’ measures the terms and conditions for third party access, the extent to which consumers can chose supplier, and the existence of a liberalized wholesale market for power. Zero means none, 1 means this is fully liberalized. The second electricity liberalization indicator is ‘Vertical Integration’, or the extent to which the industry has been unbundled, 1 meaning the industry is integrated, 0 meaning it is fully unbundled (Conway and Nicoletti 2006). Indicators for ownership are also included: 0 means full public ownership; 1 means total private ownership.

**Table 1**

EU Telecoms Multinationals: Size, Internationalisation and Regulatory Reform Indicators 1999, 2003 and 2006																			
Company	Country	Revenues (000 euros)			Employees (000)			Internationalisation			Entry Regulation			Market structure			Privatization		
		1999	2003	2006	1999	2003	2006	1999	2003	2006	1999	2003	2006	1999	2003	2006	1999	2003	2006
Deutsche Telekom	Germany	35 325	62 739	77 069	203 268	251 263	248 480	8	38	47	100	100	100	51	64	69	41	57	63
Telefónica	Spain	24 458	31 910	66 459	146 619	221 657	232 996	58	38	62	100	100	100	30	39	44	100	100	100
France Telecom	France	29 014	51 821	64 952	174 282	148 288	191 036	13	41	47	100	100	100	39	56	60	39	41	57
Telecom Italia	Italy	29 425	35 051	40 052	122 682	93 187	83 209	6	20	26	100	100	100	30	49	54	96	100	100
BT	UK	35 438	30 359	35 937	136 800	99 900	106 204	7	7	15	100	100	100	63	77	72	100	100	100
KPN Telecom	Netherlands	9 729	14 502	15 126	38 550	31 267	26 287	9	20	29	100	100	100	35	64	52	56	81	92
Telenor	Norway	4 291	7 503	14 201	23 470	26 694	35 600	17	41	64	100	100	100	23	47	49	11	38	46
TeliaSonera	Sweden	8 149	10 108	12 342	40 155	19 450	28 528	10	49	60	100	100	100	36	56	62	15	54	51
TDC	Denmark	5 765	7 945	8 390	17 464	24 872	19 010	42	53	48	100	100	100	56	64	61	100	100	100
Portugal Telecom	Portugal	3 429	6 490	8 235	16 188	19 207	32 058	9	24	37	33	100	100	21	34	48	88	94	93
OTE	Greece	3 622	5 522	7 768	21 588	17 169	17 782	0	19	26	33	100	100	19	50	53	42	66	72
Telekom Austria	Austria	3 966	4 460	5 472	19 347	13 890	15 428	0	11	32	100	100	100	28	66	67	13	53	75
Mean		16,051	22,367	29,667	80,034	80,570	86,385	14.9	30.1	41.1	88.9	100	100	35.9	55.5	57.6	58.2	73.6	79.0
Standard Deviation		13,387	19,796	26,493	70,804	84,511	88,366	17.4	15.1	16.0	26.0	0	0	14.0	12.3	8.9	36.6	24.7	20.9

Sources: Elaborated by the authors based on Amadeus (2009), Company Annual Reports (various years) and OECD (2009).

<sup>7</sup> This is a composite indicator including mobile, trunk and international long distance telecommunications services.

Attention is first turned to the telecoms Multinationals. Pressures to reform telecommunications due to technological change, international developments and ideological beliefs have been documented elsewhere (OECD 2007). In 2006, there were five huge and eight medium-sized EU Multinationals. Interestingly, the ranking of the 'giants' changed between 1999 and 2006. In 1999, BT ranked top, just ahead of Deutsche Telekom. But, by 2006, BT's revenue had stagnated, and was reduced to fifth position, having grown much less than the other 'giants', whilst the German incumbent's revenue more than doubled, leading the pack. Telefónica ranked fifth in 1999, but leapt to second place in 2006, after growing 80% during this period. It can be seen that much of the growth of the incumbents was fuelled by internationalization. The average extent of incumbent internationalization in 1999 was nearly 15%, increasing to 41% in 2006. Internationalization of the incumbents was uneven both as regards timing and extent. Both smaller and larger incumbents were able to internationalise. In 1999, internationalization 'stars' included Telefónica (58%) and TDC (42%); by 2006, sales abroad exceeded those at home for Telenor (64%), Telefónica (62%) and TeliaSonera (60%). BT was by far the least international of the Multinationals by 2006. As regards liberalization, 'Entry Regulation' shows that Denmark, Sweden and the UK were 'first movers' during the 1990s, indeed, their liberalization preceded implementation of the EC liberalization directives. The importance of EC directives as regards timing, however, can be seen as all other countries reached full 'Entry Regulation' by the 1999 deadline, except those with official extensions: Greece, Portugal and Ireland. The UK was consistently the most open market for new entrants ('Market Structure'). Between 1999 and 2003, average access to market share for new entrants increased from 35% to 56%; but this only grew another 2% in the next three years. In 2006, incumbents still enjoyed around 43% of market share, though this was uneven. Telefónica enjoyed the



highest market share (66%), whereas BT only had 28%. Of the ‘big five’, Spain was the least open between 1999 and 2006. As ‘first-mover’, Telefónica - enjoying monopoly status and having enjoyed significant private ownership from the 1970s since nationalization was never completed – was the internationalization pioneer, starting very early on, to take advantage of the opening up of Latin American telecoms markets as part of the so-called ‘Washington Consensus’. Privatization was completed earlier on in BT, TDC and Telefónica, followed by Telecom Italia. Though telecommunications privatization was widespread across the EU in this period, public ownership remained at 24% on average in 2006, being higher in Deutsche Telekom, France Télécom, Telenor, TeliaSonera, OTE and Telekom Austria.

**Table 2**

EU Electricity Multinationals: Size, Internationalisation and Regulatory Reform Indicators 1999, 2003 and 2006																			
Company	Country	Revenues (000 euros)			Employees (000)			Internationalization			Entry Regulation			Vertical Integration			Privatization		
		1999	2003	2006	1999	2003	2006	1999	2003	2006	1999	2003	2006	1999	2003	2006	1999	2003	2006
E.ON	Germany	52,016	47,616	72,408	132,930	64,969	80,453	48	41	47	50	83	100	M	M	M	100	100	100
EDF	France	32,057	44,919	60,493	135,448	163,694	156,524	18	29	47	28	94	94	I	I	M	0	0	25
RWE	Germany	45,671	47,470	43,076	155,697	139,535	65,910	23	44	48	50	83	100	M	M	M	0	0	25
Enel ++	Italy	20,933	30,345	38,513	78,511	64,770	60,085	0	5	14	33	61	94	I	U	U	0	25	50
Endesa ++	Spain	13,495	16,644	20,774	34,930	26,600	26,948	31	39	48	94	100	100	M	U	U	75	75	75
Electrabel	Belgium	5,859	10,988	14,051	16,439	17,360	16,585	n.a.	28	40	17	61	61	I	M	M	75	75	75
Iberdrola *	Spain	7,504	10,903	11,253	12,653	13,042	16,969	0	12	18	94	100	100	M	U	U	75	75	75
Scottish Power*	UK	6,247	7,626	8,037	15,932	15,490	9,953	0	59	47	100	100	100	U	U	U	100	100	100
Vattenfall	Sweden	3,268	12,538	16,153	7,991	35,296	32,308	6	64	60	100	100	100	M	M	M	0	0	0
EnBW	Germany	4,470	11,300	13,755	12,581	34,719	20,265	9	12	7	50	83	100	M	M	M	0	0	25
National Grid	UK	2,299	13,592	13,603	3,628	28,940	20,529	0	46	46	100	100	100	U	U	U	100	100	100
Unión Fenosa	Spain	3,270	5,864	6,057	10,785	21,269	17,765	9	34	34	94	100	100	M	U	U	75	75	75
EDP	Portugal	3,954	8,030	9,390	13,992	17,388	13,333	2	19	39	28	100	100	M	M	M	50	50	50
Essent	Netherlands	5,164	8,112	6,663	9,852	12,206	10,421	0	18	23	94	100	100	M	M	U	0	0	0
Dong Energy	Denmark	915	2,489	4,780	572	1,125	2,944	0	30	33	94	100	100	I	U	U	25	25	25
Fortum	Finland	2,448	4,812	4,571	17,461	13,343	8,910	32	64	73	100	100	100	M	M	U	50	50	50
EVN	Austria	1,116	1,340	2,233	2,221	2,608	9,535	0	9	46	33	100	100	I	M	U	25	25	25
Mean		12,393	16,740	20,342	38,919	39,550	33,496	11.1	32.5	39.4	68.3	92.2	97.1				44.1	45.6	51.5
Standard Deviation		15,920	15,683	20,737	52,160	46,021	38,647	15.0	18.9	16.7	32.4	13.3	9.4				40.0	38.8	33.6

Sources: Elaborated by the authors based on Amadeus (2009), Company Annual Reports (various years) and OECD (2009).  
U=Unbundled, M=Mixed, I=Integrated.

We now turn to the EU’s 17 major electricity Multinationals ranked by revenue in 2006 (Table 2). Technological, economic and ideological factors influencing reform and EU responses have been documented elsewhere (Domanico 2007). Again, all incumbent Multinationals are from Western Europe. Unlike telecoms, where there is one major national incumbent, in electricity, there may be several, due to the organization of the sector as regional monopolies or else as a result of unbundling, as in the case of National Grid. This fact should not cause sample bias because firms in the same policy

environment may – indeed do - behave differently. Thomas (2003) predicted that the outcome of the Single Market in electricity would be a ‘seven sisters’ oligopoly. Along similar lines but for the case of France, Bauby and Varone (2007) argued that one of the paradoxes of European market integration was the successful ‘engineering’ of national energy giants, EDF and the multi-utility GDF-Suez. By 2006, the EU only had five energy giants left: E.ON, RWE, EDF, GDF-Suez<sup>8</sup> and ENEL. A pessimistic ‘seven sisters’ oligopoly now seems over-optimistic. Examining internationalization patterns, E.ON recalls Telefónica’s behaviour in that it went international very early on (48% of sales were earned abroad in 1999) whilst enjoying monopoly conditions at home. Internationalization of incumbents was, on average, 11% in 1999, and 39% by 2006, a strikingly similar outcome to the extent of internationalization in telecoms incumbents over the same period. International patterns are uneven but it is notable how some of the fastest growing incumbents during this period were the medium-sized firms, namely Vattenfall, EnBW, National Grid and EDP.

Comparison of the data on progress towards liberalization for telecoms and electricity shows how, whilst in telecoms, Entry Regulation was virtually in place by 1999, progress was slower in electricity. One convincing reason for the slowness of transposition of electricity vis-à-vis telecoms reform has been provided by the argument that the first was an intergovernmental process whilst the second was supranational (Levi-Faur 1999). So, if by 1999, nearly all countries had liberalized telecommunications, there were a number of laggards in electricity. As in telecoms, the timing and extent of liberalization was very uneven. The UK was uniquely early in its

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<sup>8</sup> Suez took over Electrabel in 2003 and then merged with GDF in 2007. Hollinger (2009).

pre-emption of EC Directives: full liberalization and unbundling were reached as early as 1995. The Nordic countries were also early movers to liberalise Entry Regulation, though Denmark was the only one to fully unbundle by 2002. These countries had historically traded electricity with each other to balance their systems and, in the late 1990s, they established the Nordic Power Exchange for a single electricity market for the four countries. After the UK lead, the path to unbundling was uneven; Spain (2002), Italy (2003) and the Netherlands (2004) responded to EC Directives. Other countries, particularly France, Belgium, Germany and Portugal moved more slowly. As regards ownership, privatization was quite slow during the period, increasing on average from 44% to 51% of these incumbents. Here, there was huge diversity: in 2006, incumbents from Germany and the UK were fully privatised whilst public ownership still dominated in Sweden, the Netherlands, France, Switzerland, Austria and Denmark. The privatization of incumbent Multinationals went much further in telecoms than in electricity.

## **5. ANALYSIS**

The five hypotheses are now tested using correlation and cluster analysis techniques. Results are divided into telecoms and electricity.

### *Telecoms*

Correlation between variables using Pearson bivariate correlation, Kendall rank and Spearman rank correlation were used to detect the strength of association between internationalization and entry regulation, market structure, ownership, size (revenue and

employees) for 1999, 2003 and 2006. Results are shown in Annex 1. Using Pearson's correlation, in 1999, there is a negative relationship between internationalization and public ownership (privately-owned incumbents were more likely to go abroad), though this correlation is not apparent applying Kendall and Spearman correlations. However, this correlation did not reappear using Pearson in 2003 or 2006. No other significant variables were detected which correlated with internationalization, including the two indicators for liberalization. So, over this period, indicators on liberalization, ownership or size do not explain the extent of incumbent internationalization. No evidence on hypotheses 1, 2, 4 or 5 is obtained.

**Table 3**

**Cluster Membership\* of EU Telecoms Multinationals: Internationalisation and liberalisation Market entry 1999, and Market Structure 1999, 2003 and 2006**

	Internationalisation and Market entry	Internationalisation and Market Structure		
	1999	1999	2003	2006
<b>Deutsche Telekom</b>	3	3	4	4
<b>Telefónica</b>	4	2	2	2
<b>France Telecom</b>	3	1	4	4
<b>Telecom Italia</b>	3	1	1	1
<b>BT</b>	3	3	3	3
<b>KPN Telecom</b>	3	1	3	1
<b>Telenor</b>	3	1	2	2
<b>TeliaSonera</b>	3	1	4	4
<b>TDC</b>	4	4	4	4
<b>Portugal Telecom</b>	1	1	1	1
<b>OTE</b>	1	1	1	1
<b>Telekom Austria</b>	3	1	3	4
Valid cases	12	12	12	12

Based on Squared Euclidean Distance and Average Distance among groups

1. Low internationalisation and low liberalisation
2. High internationalisation and low liberalisation
3. Low internationalisation and high liberalisation
4. High internationalisation and high liberalisation

Next, cluster analysis is deployed to search for groups that are found to be similar in one or more sets of variables, to test hypothesis 3. All 12 telecoms incumbent Multinationals

were considered for extent of internationalization, entry regulation and market structure for 1999, 2003 and 2006. Results are shown in Table 3. Since all Member States had attained complete entry regulation from 1999, this variable is no longer of use and is excluded from the analysis henceforth.

The cluster analysis reveals some interesting patterns. Starting with 1999, there are two sets of findings: internationalization and entry regulation, and internationalization and market structure. Regarding the former, two incumbents – TDC and Telefónica - set the pace to internationalise, and which constitute cluster 4. Both incumbents underwent significant internationalization and were based in countries where entry regulation had been liberalised. The vast majority of incumbents, however, fell into cluster 3; here, internationalization is rather slow, whilst entry regulation is liberalised. Portugal and Greece predictably fall into a fourth category, cluster 1; where incumbent internationalization is slow and entry regulation is officially delayed.

Analysis of internationalization and market structure throws a more nuanced light on these results, particularly as regards the strategies of TDC and Telefónica. TDC is left alone in Cluster 4, since market share is quite liberalized in Denmark. Telefónica uniquely comprises Cluster 2, having embarked on an ambitious internationalization programme whilst enjoying a relatively high share of its domestic market. Hence, TDC and Telefónica emerge as opposites: the two most international of companies pursued this expansion based on different shares of the domestic market. Again, the vast majority of incumbents fell into the same category, cluster 1; here, internationalization is low, as is market structure liberalization. Exceptions are BT and Deutsche Telekom (cluster 3), where internationalization is quite low but market structure has been highly

liberalized. The clusters in 1999 show clearly that there are no automatic relationships between the variables under study, rather, in similar situations incumbents pursued different paths toward internationalization.

A number of patterns emerge over the next seven years. Firstly, Telefónica is joined by Telenor in cluster 2. As mentioned in section four, Telefónica and Telenor were both internationalization 'stars' as regards their aggressive pursuit of internationalization. Both did so in a context of slower liberalization of market structure. Telenor emulates Telefónica's strategy from 2003. Secondly, ambitious internationalization is now pursued by other incumbents this time in the context of a liberalised market structure. TDC's strategy is adopted by TeliaSonera, France Télécom, Deutsche Telekom and, to a lesser extent, Telekom Austria, which comprise cluster 4. There is a third group of incumbents (cluster 1) which internationalized more slowly, based in countries where market structure was less liberalised: Telecom Italia, KPN, Portugal Telecom and OTE. Finally, BT alone forms cluster 3, as incumbent internationalization was relatively low and where market structure had been highly liberalization. BT's lower international level was due to the fact that much of its initial international activity was sold off after its abandonment during firm re-organization.

### *Electricity*

Using the same correlation techniques and periods of time as for telecoms, the extent of incumbent electricity Multinationals was analysed, considering entry regulation, vertical integration, ownership, revenue and employees. No correlations were detected between incumbent internationalization and entry or vertical integration (see Annex). In 1999,

there is a significant correlation between incumbent size and internationalization, though this is not seen in 2003 and 2006. It appears that larger firms had the edge when embarking on internationalization strategies in the earlier period. However, since no correlations were found between liberalization and internationalization, no evidence for hypotheses 1, 2, 4 and 5 was detected.

**Table 4.**

**Cluster Membership of EU Electricity Multinationals: Internationalisation, Entry regulation and Vertical Integration 1999, 2003 and 2006**

	Internationalisation and Entry regulation			Internationalisation and Vertical integration		
	1999	2003	2006	1999	2003	2006
EOn	2	4	4	1	1	1
EDF	1	4	4	2	2	1
RWE	1	4	4	1	1	1
Enel ++	1	1	3	2	3	3
Endesa ++	4	4	4	1	4	4
Electrabel**	0	1	2		3	1
Iberdrola *	3	3	3	3	3	3
Scottish Power*	3	4	4	3	4	4
Vattenfall	3	4	4	3	1	1
EnBW	1	3	3	3	3	2
National Grid	3	4	4	3	4	4
Unión Fenosa	3	4	4	3	4	4
EDP	1	3	4	3	3	1
Essent	3	3	3	3	3	3
Dong Energy	3	4	4	2	4	4
Fortum	4	4	4	1	1	1
EVN	1	3	4	2	3	4
Valid cases	16	17	17	16	17	17

Based on Squared Euclidean Distance and Average Distance among groups

- |  |   |
|--|---|
| 1. Low internationalisation and low liberalisation   | 1. High international & high integration  |
| 2. High internationalisation and low liberalisation  | 2. Low international and high integration |
| 3. Low internationalisation and high liberalisation  | 3. Low international and low integration  |
| 4. High internationalisation and high liberalization | 4. High international and low integration |

Next, cluster analysis is applied in order to detect any patterns in incumbent internationalization, considering the same variables and time period as previously. Results are shown in Table 4. The relationship between internationalization and entry regulation is first analysed, shown on the left part of Table 4. In 1999, the most internationalized of incumbents fell into two clusters. On the one hand were those incumbents which internationalized strongly whilst entry regulation was also liberalized, Fortum and Endesa, forming cluster 4. E.ON, in contrast, stands out for its

aggressive internationalization in the context of low entry regulation liberalization. As in telecoms, the leader incumbent internationalizers emerged from contexts where liberalization is both less and more advanced. E.ON could be compared to Telefónica in its pursuit of ambitious internationalization from a relatively closed market. Most incumbents pursued relatively cautious internationalization programmes in 1999. There were two similarly-sized clusters of incumbents here: cluster 3 where liberalization was more advanced, and cluster 1 where this was delayed. Included in cluster 3 were Spanish regional incumbents (Iberdrola and Unión Fenosa) and in cluster 1 were German regional incumbents (RWE and EnBW). These Spanish and German incumbents had much lower internationalization levels than Endesa and E.ON respectively. This suggests that even a national-sectoral approach cannot account for the variety of firm strategies adopted. Rather, varieties of response are located at the firm level. Finally, most incumbents pursued internationalization slowly; only five of seventeen incumbents were pursuing internationalization with great enthusiasm in 1999.

Attention is now turned to the other liberalization indicator, vertical integration, shown on the right-hand side of Table 4. Cluster 1 comprises incumbents which made over-the-average progress unbundling and where internationalization was stronger: Fortum, Endesa, E.ON and RWE.<sup>9</sup> As mentioned previously and in common with telecoms, the vast majority of electricity incumbents were slow to internationalise in 1999. In both

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<sup>9</sup> In the 1999 cluster analysis of internationalization and entry regulation RWE was included in the cluster of lower internationalized and lower liberalized firms: however, in the cluster showing internationalization and vertical integration, it falls into the group of more highly internationalised firms based in countries which are slower to unbundle.



telecoms and electricity, only a minority of incumbents were already strongly internationalised by 1999. Of the lesser internationalised incumbents, three fell into cluster 2, where unbundling is progressing slowly; the bulk (eight) fall into cluster 3, where unbundling is being pursued.

How did these incumbents evolve over the next seven years? Analysis is first turned to internationalization and entry regulation. By 2006, there is some convergence in the sense that all incumbents bar one, Electrabel, which is discussed below, are in either cluster 3 or 4, both of which are characterised by high liberalization. Of these incumbents, cluster 4 is the dominant one, grouping 12 incumbents that internationalized strongly – following the pattern set by Fortum and Endesa – based in home markets where entry regulation is liberalised. The second largest cluster, 3, is composed of four incumbents, grouping incumbents which internationalised less though from liberalized environments (Enel, Iberdrola, EnBW and Essent). Interestingly, two of these more ‘hesitant’ internationalizers, Iberdrola and Enel have, since 2006, completed huge acquisitions. In 2007, Iberdrola took over Scottish Power, whilst in 2009, Enel took over Endesa. It seems that the ‘hesitant’ internationalizers ‘bided their time’ until they made their move to acquire more internationalised incumbents, absorbing all their international business. Chronologically, the UK was the first of the three to liberalise entry, followed by Spain with Italy trailing behind. From this perspective, a ‘wait-and-see’ logic may have proved advantageous: slower liberalisers took advantage of incumbents in countries had had liberalised previously. The wave of massive Mergers and Acquisitions reflects the fact that the EU electricity market is characterised by monopolistic competition, and that market integration is resulting in domination by a small number of huge Multinationals. Belgium’s traditionally private

Electrabel was the main exception to the rule. Here, a defensive strategy was at work. Electrabel pursued an ambitious internationalization programme between 1999 and 2006 as the government delayed market opening. Fears about the incumbent's vulnerability were proved correct when immediately, on opening the market, Electrabel was snapped up by Suez, after which both were merged with Gaz de France to form one of Europe's largest multi-utilities (Bauby and Varone 2007).

As regards internationalization and vertical integration, the most internationalized of electricity incumbents are divided up nearly equally into two clusters, since, whilst entry regulation liberalization was nearly complete in 2006, progress on unbundling was mixed. First, there was a group of seven highly internationalised incumbents based in countries where unbundling was more advanced (cluster 4). This included National Grid, Scottish Power, Endesa, Unión Fenosa, Dong Energy and EVN. These incumbents were able to internationalise as both entry regulation and unbundling were implemented. Second, a group of six incumbents (cluster 1) pursued significant internationalisation expansion, in a context of liberalised entry but delayed unbundling (E.ON, EDF, RWE, Vattenfall, EDP, and Fortum). The main exception was Electrabel, which had delayed both forms of liberalization, as previously explained. So, Finland's Fortum, which in 1999 seemed to be setting the pace for internationalization in the context of advanced liberalization, and saw its foreign revenues increase over seven years from 32% to 73%, did so whilst unbundling remained stagnant. A similar observation can be made of the other cluster members. A third cluster, 3, comprises three incumbents whose internationalization was somewhat slower in a context of greater progress unbundling. EnBW is alone in cluster 2, enjoying higher vertical integration but less internationalization. Here, it can be seen how Iberdrola and EnBW,

operating in the same policy environment as their other highly internationalized Spanish and German peers, were both much slower to internationalise. Again, diversity is beyond national and sectoral patterns, it is ultimately located at the firm level.

## **6. CONCLUSIONS: EXPLAINING INTERNATIONAL PATTERNS IN TELECOMS AND ELECTRICITY**

Regulatory reforms defined broadly as liberalization were a prerequisite for the rise of telecoms and energy Multinationals. The internationalization of EU incumbents could not have taken place without liberalization of entry regulation and would have been difficult without progress on unbundling and privatization. However, on the ground, it is highly unlikely that all countries implement liberalization in precisely the same way at the same moment. The perception that some countries behave asymmetrically, by delaying or restricting liberalization whilst promoting ‘national champions’ to takeover other countries’ strategic ‘jewels in the crown’, is a considerable source of tension in the EU. A clearer understanding of State and firm response to liberalization helps shed light on the political economy of market integration.

Three main hypotheses on the relationship between internationalization and liberalization were established. The first hypothesis predicted that those incumbents most exposed to earlier and deeper liberalization would be those which internationalized most. The second argument predicted that incumbents would pressurise States to restrict or delay liberalization, so those with secure financial and political resources would be most able to embark on high-risk adventures abroad. Correlation was used to test these hypotheses, and it was confirmed that no evidence existed on a direct relationship

between internationalization and liberalization or ownership. Hypotheses 1 and 2 (and secondary hypotheses 4 and 5) were rejected.

Attention was then turned to hypothesis 3, which, asserting the importance of institutional diversity, anticipated that countries and sectors would pursue various routes toward liberalization and internationalization, though often moving towards a similar point. Cluster analysis was used to reveal a diversity of responses to liberalization and internationalization. In general, this diversity can be organised at the country level, with modifications for sectors and, also, for firms. Countries and firms can be organised into larger and smaller ones.

The Single Market led to the emergence of Multinationals in telecommunications and electricity from Western Europe; Eastern Europe was a recipient. The large continental countries, particularly France and Germany, dominated the battle for precedence in assuring their respective national incumbents would dominate European Multinationals in both sectors. Neither were liberalization 'pace-setters' nor were they consistent 'laggards': rather, they were 'middle-of-the-roaders'. France was slower than average to liberalize electricity, whilst E.ON's early internationalization occurred in near monopolistic conditions. In telecoms, France moved to liberalise at an average pace; Germany was somewhat faster. Spain and Italy took strides to join them: Telefónica emerged as a leading world Multinational in near monopoly conditions, though Spain was among the 'pace-setters' liberalizing electricity. Relatively faster liberalization did not prevent Endesa from emerging as a leading European Multinational, though Iberdrola and Unión Fenosa were more hesitant to internationalize. Italy was somewhat slower to implement liberalization and its incumbents were slower to go abroad,

nevertheless, Enel and Telecom Italia occupied positions in the top five by 2006. The most international of the EU's Multinational telecoms and electricity incumbents emerged from the larger continental economies: France, Germany, Italy and Spain. Though there were no automatic relations between the timing and extent of liberalization and incumbent internationalization, the large part of these Multinationals came about more thanks to a slower or middle-of-the-road approach to liberalization than a faster one. The UK took a different path: it embraced liberalization enthusiastically, acting prior to EC directives in both sectors. Today, UK incumbents do not dominate the EU Multinational rankings in these sectors. In telecommunications, BT sacrificed its domination of the rankings, de-internationalising in order to prioritise its home market. The UK now presents itself as a highly attractive site for investment: Telefónica's O2 has already overtaken Vodafone in the UK, and proposed mergers between Orange and T-Mobile, and France Télécom and Deutsche Telekom would put Vodafone further down the UK ranking (Parker 2009). In electricity, Scottish Power was taken over by Iberdrola.

Among the smaller economies, the Nordic countries constituted a close group. In general, these countries liberalised earlier, whilst incumbents responded enthusiastically to internationalization options, though on a sub-regional basis. In electricity, this was because a trade pooling system existed; in telecommunications, the 'star' internationaliser, Telenor, earned 23% of foreign revenue from other Nordic countries, 12% from Eastern Europe and 30% from beyond Europe. In telecommunications, Norway liberalised more slowly than Sweden, Finland and Denmark, and its investments beyond Europe were high, hence Telenor's comparison with Telefónica. Defensive patterns dominated behaviour of many of the other smaller economies. In

Greece, the Netherlands and Portugal, liberalization was implemented relatively slowly, and incumbents internationalised though quite cautiously. In Belgium, the efforts to protect Electrabel via slow liberalization ultimately failed. Austria was bolder to liberalize and its incumbents to internationalise, particularly focusing on the markets in East Europe.

Internationalization patterns of EU incumbents in telecoms and electricity are best explained using comparative political economy lenses, whereby country and sectoral trends, interwoven with the firm-level, provide a superior explanation for the outcome of market integration in these critical sectors.

Judith Clifton is Senior Lecturer in Political Economy, University of Cantabria.

Daniel Díaz-Fuentes is Profesor of Applied Economics, University of Cantabria.

Julio Revuelta is Assistant Lecturer of Applied Economics, University of Cantabria.

Address for correspondence: Judith Clifton, Departamento de Economía, Universidad de Cantabria, Av. De los Castros S.N., Cantabria, Spain E39005.

[judith.clifton@unican.es](mailto:judith.clifton@unican.es)

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## Annex I

Correlation techniques were used to test for the relationship between incumbent internationalization, liberalization and privatization, controlling for incumbent size in 1999, 2003 and 2006. Bivariate Pearson's correlation coefficients were run to determine the degree of relationships among the predictors and incumbent internationalisation (Table A.1 tests electricity, Table A.3, telecommunications).

**Table A.1: Bivariate Pearson's correlations between Electricity Incumbent Internationalisation, Entry Regulation, Vertical Integration, Privatization and Size (Revenues and Employees) 1999, 2003 and 2006.**

1999		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Vertical Integration</i>
<i>Internationalization</i>	Pearson Correlation	0.666**	0.596*	-0.090	0.325	-0.030
	Sig. (2-tailed)	(0.005)	(0.015)	(0.740)	(0.219)	(0.911)
<i>Revenues</i>	Pearson Correlation		0.967**	-0.469	0.205	0.137
	Sig. (2-tailed)		(0.000)	(0.067)	(0.447)	(0.612)
<i>Employees</i>	Pearson Correlation			-0.540*	0.085	0.234
	Sig. (2-tailed)			(0.031)	(0.753)	(0.382)
<i>Entry Regulation</i>	Pearson Correlation				0.173	-0.543*
	Sig. (2-tailed)				(0.523)	(0.030)
<i>Privatization</i>	Pearson Correlation					-0.680**
	Sig. (2-tailed)					(0.004)
2003		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Vertical Integration</i>
<i>Internationalization</i>	Pearson Correlation	0.049	0.057	0.317	0.191	-0.004
	Sig. (2-tailed)	(0.852)	(0.829)	(0.215)	(0.463)	(0.986)
<i>Revenues</i>	Pearson Correlation		0.895**	-0.418	0.132	0.381
	Sig. (2-tailed)		(0.000)	(0.095)	(0.614)	(0.132)
<i>Employees</i>	Pearson Correlation			-0.287	-0.038	0.515*
	Sig. (2-tailed)			(0.264)	(0.884)	(0.035)
<i>Entry Regulation</i>	Pearson Correlation				-0.152	-0.106
	Sig. (2-tailed)				(0.560)	(0.685)
<i>Privatization</i>	Pearson Correlation					-0.352
	Sig. (2-tailed)					(0.165)
2006		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Vertical Integration</i>
<i>Internationalization</i>	Pearson Correlation	0.068	0.097	0.030	-0.100	0.333
	Sig. (2-tailed)	(0.796)	(0.710)	(0.908)	(0.702)	(0.192)
<i>Revenues</i>	Pearson Correlation		0.888**	-0.025	0.209	0.417
	Sig. (2-tailed)		(0.000)	(0.923)	(0.420)	(0.096)
<i>Employees</i>	Pearson Correlation			-0.030	-0.019	0.397
	Sig. (2-tailed)			(0.910)	(0.943)	(0.115)
<i>Entry Regulation</i>	Pearson Correlation				-0.060	-0.269
	Sig. (2-tailed)				(0.820)	(0.296)
<i>Privatization</i>	Pearson Correlation					0.061
	Sig. (2-tailed)					(0.818)

Notes: N=16. \* Correlation is significant at the \*p<0.05 level (2-tailed). \*\* Correlation is significant at the \*\*p<0.01 level (2-tailed).

We also conducted Kendall rank correlation (a non-parametric test) and Spearman rank correlation (a non-parametric test to measure the degree of association between

variables). In general, Kendall and Spearman correlations show similar results, so, only Kendall correlations are shown (Table A.2 for electricity, Table A.4 for telecommunications).

**Table A.2: Kendall correlations for Electricity Incumbent Internationalisation, Market Entry, Privatisation, Vertical Integration and size of the firms (Revenues and Employees).**

<b>1999</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Vertical Integration</i>
<i>Internationalization</i>	Correlation Coefficient	0.314	0.461*	-0.081	0.203	-0.049
	Sig. (2-tailed)	(0.108)	(0.018)	(0.697)	(0.330)	(0.825)
<i>Revenues</i>	Correlation Coefficient		0.750**	-0.303	0.156	0.000
	Sig. (2-tailed)		(0.000)	(0.125)	(0.429)	(1.000)
<i>Employees</i>	Correlation Coefficient			-0.284	0.138	0.022
	Sig. (2-tailed)			(0.149)	(0.485)	(0.916)
<i>Entry Regulation</i>	Correlation Coefficient				0.152	-0.573*
	Sig. (2-tailed)				(0.472)	(0.011)
<i>Privatization</i>	Correlation Coefficient					-0.609**
	Sig. (2-tailed)					(0.007)
<b>2003</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Vertical Integration</i>
<i>Internationalization</i>	Correlation Coefficient	0.044	0.148	0.236	0.236	0.000
	Sig. (2-tailed)	(0.804)	(0.409)	(0.241)	(0.218)	(1.000)
<i>Revenues</i>	Correlation Coefficient		0.691**	-0.479*	0.218	0.145
	Sig. (2-tailed)		(0.000)	(0.017)	(0.252)	(0.481)
<i>Employees</i>	Correlation Coefficient			-0.440*	0.218	0.241
	Sig. (2-tailed)			(0.028)	(0.252)	(0.240)
<i>Entry Regulation</i>	Correlation Coefficient				-0.172	-0.282
	Sig. (2-tailed)				(0.423)	(0.224)
<i>Privatization</i>	Correlation Coefficient					-0.254
	Sig. (2-tailed)					(0.248)
<b>2006</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Vertical Integration</i>
<i>Internationalization</i>	Correlation Coefficient	0.097	0.097	0.132	0.025	0.319
	Sig. (2-tailed)	(0.591)	(0.591)	(0.529)	(0.898)	(0.134)
<i>Revenues</i>	Correlation Coefficient		0.779**	-0.336	0.234	0.364
	Sig. (2-tailed)		(0.000)	(0.103)	(0.219)	(0.083)
<i>Employees</i>	Correlation Coefficient			-0.259	0.234	0.283
	Sig. (2-tailed)			(0.210)	(0.219)	(0.178)
<i>Entry Regulation</i>	Correlation Coefficient				0.128	-0.195
	Sig. (2-tailed)				(0.563)	(0.426)
<i>Privatization</i>	Correlation Coefficient					0.067
	Sig. (2-tailed)					(0.767)

Notes: N=16, \* Correlation is significant at the \*p<0.05 level (2-tailed). \*\* Correlation is significant at the \*\*p<0.01 level (2-tailed).

**Table A.3: Bivariate Pearson's correlations between Telecoms Incumbent Internationalisation, Entry Regulation, Market Structure, Privatization and Size (Revenues and Employees) 1999, 2003 and 2006.**

<b>1999</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Market Structure</i>
<i>Internationalization</i>	Pearson Correlation	0.073	0.151	0.264	0.479	0.184
	Sig. (2-tailed)	(0.812)	(0.623)	(0.383)	(0.097)	(0.547)
<i>Revenues</i>	Pearson Correlation		0.958**	0.404	0.383	0.587*
	Sig. (2-tailed)		(0.000)	(0.171)	(0.196)	(0.035)
<i>Employees</i>	Pearson Correlation			0.361	0.263	0.492
	Sig. (2-tailed)			(0.226)	(0.386)	(0.088)
<i>Entry Regulation</i>	Pearson Correlation				-0.106	0.459
	Sig. (2-tailed)				(0.730)	(0.115)
<i>Privatization</i>	Pearson Correlation					0.386
	Sig. (2-tailed)					(0.193)
<b>2003</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Market Structure</i>
<i>Internationalization</i>	Pearson Correlation	0.112	0.186	. <sup>a</sup>	-0.236	-0.230
	Sig. (2-tailed)	(0.715)	(0.542)	.	(0.437)	(0.449)
<i>Revenues</i>	Pearson Correlation		0.977**	. <sup>a</sup>	0.009	0.170
	Sig. (2-tailed)		(0.000)	.	(0.977)	(0.580)
<i>Employees</i>	Pearson Correlation			. <sup>a</sup>	-0.023	0.100
	Sig. (2-tailed)			.	(0.939)	(0.746)
<i>Entry Regulation</i>	Pearson Correlation				. <sup>a</sup>	. <sup>a</sup>
	Sig. (2-tailed)				.	.
<i>Privatization</i>	Pearson Correlation					0.067
	Sig. (2-tailed)					(0.827)
<b>2006</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Market Structure</i>
<i>Internationalization</i>	Pearson Correlation	0.292	0.338	. <sup>a</sup>	-0.112	-0.188
	Sig. (2-tailed)	(0.333)	(0.258)	.	(0.716)	(0.538)
<i>Revenues</i>	Pearson Correlation		0.985**	. <sup>a</sup>	0.091	0.154
	Sig. (2-tailed)		(0.000)	.	(0.768)	(0.616)
<i>Employees</i>	Pearson Correlation			. <sup>a</sup>	0.086	0.130
	Sig. (2-tailed)			.	(0.780)	(0.671)
<i>Entry Regulation</i>	Pearson Correlation				. <sup>a</sup>	. <sup>a</sup>
	Sig. (2-tailed)				.	.
<i>Privatization</i>	Pearson Correlation					0.047
	Sig. (2-tailed)					(0.879)

Notes: N=12. \* Correlation is significant at the \*p<0.05 level (2-tailed). \*\* Correlation is significant at the \*\*p<0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

**Table A.4: Kendall correlations among Telecom Incumbent Internationalisation, Entry Regulation, Privatisation, Market Structure and Size (Revenues and Employees).**

<b>1999</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Market Structure</i>
<i>Internationalization</i>	Correlation Coefficient	0.000	0.105	0.273	0.040	0.184
	Sig. (2-tailed)	(1.000)	(0.622)	(0.274)	(0.853)	(0.389)
<i>Revenues</i>	Correlation Coefficient		0.718**	0.531*	0.248	0.538*
	Sig. (2-tailed)		(0.001)	(0.030)	(0.243)	(0.010)
<i>Employees</i>	Correlation Coefficient			0.435	0.092	0.410
	Sig. (2-tailed)			(0.076)	(0.667)	(0.051)
<i>Entry Regulation</i>	Correlation Coefficient				-0.098	0.483*
	Sig. (2-tailed)				(0.691)	(0.048)
<i>Privatization</i>	Correlation Coefficient					0.275
	Sig. (2-tailed)					(0.197)
<b>2003</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Market Structure</i>
<i>Internationalization</i>	Correlation Coefficient	0.144	0.170	. <sup>a</sup>	-0.122	-0.177
	Sig. (2-tailed)	(0.500)	(0.425)	.	(0.575)	(0.419)
<i>Revenues</i>	Correlation Coefficient		0.821**	. <sup>a</sup>	0.160	0.107
	Sig. (2-tailed)		(0.000)	.	(0.457)	(0.621)
<i>Employees</i>	Correlation Coefficient			. <sup>a</sup>	0.294	0.053
	Sig. (2-tailed)			.	(0.172)	(0.805)
<i>Entry Regulation</i>	Correlation Coefficient				. <sup>a</sup>	. <sup>a</sup>
	Sig. (2-tailed)				.	.
<i>Privatization</i>	Correlation Coefficient					0.000
	Sig. (2-tailed)					(1.000)
<b>2006</b>		<i>Revenues</i>	<i>Employees</i>	<i>Entry Regulation</i>	<i>Privatization</i>	<i>Market Structure</i>
<i>Internationalization</i>	Correlation Coefficient	0.234	0.260	. <sup>a</sup>	-0.135	-0.130
	Sig. (2-tailed)	(0.270)	(0.221)	.	(0.534)	(0.540)
<i>Revenues</i>	Correlation Coefficient		0.821**	. <sup>a</sup>	0.187	0.026
	Sig. (2-tailed)		(0.000)	.	(0.385)	(0.903)
<i>Employees</i>	Correlation Coefficient			. <sup>a</sup>	0.187	0.000
	Sig. (2-tailed)			.	(0.385)	(1.000)
<i>Entry Regulation</i>	Correlation Coefficient				. <sup>a</sup>	. <sup>a</sup>
	Sig. (2-tailed)				.	.
<i>Privatization</i>	Correlation Coefficient					0.000
	Sig. (2-tailed)					(1.000)

Notes: N=12, \* Correlation is significant at the \*p<0.05 level (2-tailed). \*\* Correlation is significant at the \*\*p<0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.



