Delegation and Varieties of Capitalism: Explaining the Independence of National Competition Agencies in the European Union

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Abstract: This article aims to explain why, despite the fact that all national competition authorities (NCAs) in EU member states enforce the same law, relevant differences exist in the degree of independence that these agencies enjoy. The author advances an original theoretical framework according to which the decision on the independence of NCAs depends on the structure of the economic system of a country. In particular, it is hypothesized that the means by which firms operate in the national market affects the tendency of national legislators to delegate more or less independence to the NCA. The statistical analysis carried out shows that both countries with low and high levels of employer density tend to have less independent competition authorities than those of other countries. On the one hand, the findings support the argument, advanced by varieties-of-capitalism scholars, that liberal market economies and coordinated market economies achieve greater efficiency than mixed market economies. On the other, the expectation that all institutional choices should be coherent with the firms' coordination method is not confirmed.

Keywords: agencies, competition, credibility, independence, varieties of capitalism.

INTRODUCTION

Independence is often considered as a necessary prerequisite for regulatory agencies. Independent Regulatory Agencies (IRAs) deal with complex issues that require expertise, they must quickly respond to changes in the economic environment, and they must “shield market interventions from interference from captured politicians and bureaucrats” (OECD, 2002: 95). But not all IRAs are equally independent. If we take into account two competition authorities, the German *Bundeskartellamt* and the Italian *Autorità garante della concorrenza e del mercato,* and we ask which one enjoys higher formal independence, many people (including experts) would indicate the first. Yet, they would be wrong. All the members of the Italian competition authority are appointed for seven years (the Parliament is elected for five years), and they cannot be removed from their office, while the President of the German competition authority does not have a fixed term of office. The *Bundeskartellamt* is under the authority of the Federal Ministry of Economy, while the Italian competition authority is completely separate from the government. Why these differences? Are Italian politicians more interested in competition enforcement than German ones? Does Italy need to show its commitment to competition more than Germany does?

Over the last 20 years, national governments and parliaments have delegated an increasing number of tasks to IRAs, in various policy fields (competition enforcement, stock exchange markets, telecommunications, energy, pharmaceuticals, etc.). The spread of these agencies has coincided with processes of de-regulation and privatization, and has been identified as “the rise of the regulatory state” (Majone, 1994) and as new form of “regulatory capitalism” (Levi-Faur, 2005): market liberalization has been accompanied by a proliferation of rules and authorities in charge of enforcing them (Vogel, 1996).

Many books and articles have been written on IRAs, and several attempts have been made to explain their independence. However, these attempts have been, to a large extent, unsatisfactory: a large part of the literature analyses only the US institutional system, thus lacking any comparative perspective (see for instance Fiorina, 1982; Weingast and Moran, 1983; McCubbins and Schwartz, 1984; McCubbins *et al.*, 1987; Moe, 1990; Bawn, 1995); another branch of the literature has adopted a comparative perspective, but has mainly focused on the *establishment* of IRAs, and not on the amount of discretion conferred on them (Thatcher and Stone Sweet, 2002; Wilks and Bartle, 2002; Levi-Faur, 2004; Jordana and Levi-Faur, 2005); the contributions which have empirically tested some of the theories of delegation by *explaining formal independence* of regulatory agencies are limited (Gilardi, 2002; 2005; Elgie and McMenamin, 2005; Wonka and Rittberger, 2010) and all of them have analysed a different sample of IRAs. It is therefore very difficult to compare the findings of these studies them and draw univocal conclusions about their results.

This article focuses on a particular subset of IRAs – national competition authorities (NCAs) – and it aims to contribute to the literature on both regulatory agencies and European competition policy. These two literatures seem to practically ignore each other. Scholars who study IRAs tend to analyse their institutional features without paying enough attention to the legislative and administrative framework in which agencies are embedded. In this respect, I argue that a sector-oriented focus gives a much better grasp of the reasons that explain agency independence – though not everything can be explained by sector-specific factors. European competition policy experts, on the other hand, often treat NCAs as “satellites” of the Commission, and fail to acknowledge their impact on competition enforcement at the national level.

In Europe, competition enforcement was introduced by the European Coal and Steel Community treaty (1951), and was further expanded by the European Economic Community (ECC) treaty (1957), before any European country established a NCA. Thus, competition policy is an example of policy that has first been promoted at the EU level, and only at a later stage adopted by the member states. For several decades, most European countries (with the exception of Germany and UK) did not have an autonomous competition regime. Competition enforcement was carried out directly by the Commission, which enjoyed considerable autonomy in this field (Kassim and Wright, 2009: 741). After the Single European Act (1986), the activism of the Commission increased, and the adoption of the European Merger regulation in 1989[1] strengthened and broadened the scope of the EEC antitrust legislation (Cini and McGowan, 1998: 32–33). At the same time, members of the EEC and candidate countries began to adopt national competition legislations and to establish NCAs. The issue of the coordination between EU and national legislation, and between the Commission and the NCAs, became of primary importance (Cini and McGowan, 1998: 189). Germany proposed the creation of a European Cartel Office (ECO): according to proponents of this approach, a European independent agency would have insured a stricter and more consistent enforcement of competition law among all the member states (Wilks and McGowan, 1995; 1996). The fact that DG Competition had to strive for obtaining a majority vote on all its decisions within the Commission was seen as a major limitation of the EEC competition regime (see Karagiannis 2010, on the implications of collegiality in European competition policy).

This debate came to an end in 2003, with the adoption of European Council Regulation 1/2003. No ECO was created (the decision-making process at the EU level did not change); instead, much emphasis was placed on the coordination between the Commission and NCAs. The latter were empowered to enforce both national and EU competition law. To allocate competencies and to discuss strategies and best practices, it was decided to set up the European Competition Network (ECN), a forum in which Commission and NCAs periodically meet and exchange information about their activity. Regulation 1/2003[2] prevents member states from enforcing competition law through executive bodies which are not formally separate from the government, by requiring that every member state delegate competition enforcement to a "competition authority" or to the courts.[3] At the same time, the regulation does not specify either that these bodies have to be independent or how much independence they ought to enjoy. Europe therefore has a very peculiar regime, in which 27 countries apply the same competition law, but with very different administrative instruments.

As stated earlier, independence is usually regarded as a positive characteristic for regulatory agencies, and competition authorities are not an exception. First of all, the functions of these bodies are para-judiciary in the context of investigations on suspected illegal conducts and consequent decisions: thus, everyone expects that they decide solely on the basis of law and that they judge facts impartially. Second, an independent NCA is meant to attract private investment and create a business environment that cannot be influenced by political fluctuations. Third, in many countries national governments still own companies that play a relevant role in the market: it is therefore crucial, for national and international competitors, that the executive does not make decisions in which it would have a clear conflict of interest.

However, these are not the only motivations that politicians have in mind when they decide on the degree of independence to be given to IRAs, and this is particularly evident in the case of competition authorities in the EU member states. Indeed, as has been said, all these regulators apply the same law: if their independence were decided only for reasons related to their tasks, they should all be very similar in this respect.[4] We instead observe relevant differences between them (see Figure 1), and, what is more, their degree of autonomy from the political sphere is not always as we would expect: how many people, asked whether the German or the Romanian competition authority is formally more independent from the government, would indicate the latter?

The aim of this article is therefore to investigate which factors explain the variation in the formal independence of NCAs in the EU. To do so, I advance and test a theoretical framework in which the final outcome (the amount of independence enjoyed by the competition authority) depends on the structure of the economic system of a country. In particular, I hypothesize that the means by which firms operate in the internal market (i.e. through free competition, through coordination, or through a mix of both) affects the tendency of national legislators to delegate more or less independence to the NCA. The article is structured as follows. I will first present the model that I develop to explain delegation to NCAs, and the hypothesis that I draw from it. Then, I will illustrate the data and the operationalization of the variables. Finally, I will show the results of a statistical analysis conducted on all the competition authorities of the EU member states, and discuss its main implications.

INDEPENDENCE AND "VARIETIES OF CAPITALISM": A NEW INSIGHT

Competition authorities represent one of the ways by which states regulate the economy. The implementation of competition law has a primary importance in modern democracies, as it concerns the way in which public and private interests are related. Competition law aims to find a balance between private property rights and the public interest (Peritz, 1990), in order to avoid the prospect that some people's freedom turns into "coercion, impositions on others"

(Amato, 1997: 2). Competition authorities are the instruments that modern market economies have typically employed to safeguard this balance. We have already mentioned why their independence is meant to be important. Besides practical considerations, independence also has a symbolic value: the fact that politicians give up control on certain issues and delegate them to independent bureaucrats can influence the expectations of the economic actors, and improve economic performance (Barro and Gordon, 1983; Kydland and Prescott, 1977; Majone, 1996; Rogoff, 1985). However, it must also be stressed that competition enforcement is not just a "technical" application of abstract principles: it involves allowing some firms to acquire others (therefore, the creation of bigger economic actors), assessing the damage that anti-competitive practices may cause to other firms, and imposing sanctions and fines. As former competition commissioner Karol van Miert argued, "competition policy is not something neutral, it is 'politics'" (cited by Wilks and McGowan, 1995: 268). Competition enforcement decisions always have important redistributive effects (among firms and consumers), and they can have a remarkable impact on the economy. Hence, governments are obviously concerned about what competition agencies do.

The assumption that I make is that politicians[5] prefer not to delegate power to an independent authority in salient policy fields like competition enforcement.[6] This assumption is based on that of principal-agent (P-A) theory (Miller, 2005; Ross, 1973), according to which the preferences of the principal (legislators, in this case) and the agent (the NCA) are meant to be different. In cases of divergent preferences, any policy outcome chosen by the agent will be more distant from the principal's ideal point than if the principal had chosen the policy outcome by her/himself. Politicians can however find it convenient to delegate because this reduces their workload and allows them to regulate technically complex policy areas (Franchino, 2002: 678) or because delegation allows them to "shift the blame" for potentially unpopular measures (Fiorina, 1982). However, we have neither variation in technical complexity as regards competition enforcement in EU member states (because we have the same policy enforcement in all countries), nor have we blame-shifting (because breaking cartels or sanctioning monopolists are usually quite popular decisions). Therefore, we must point to other differences in order to explain why various degrees of independence are chosen.

I argue that what differs among the EU member states is the *opportunity-cost* of delegating to a competition agency. For some countries, giving little independence to the NCA does not represent a high cost. For others, it does. Given the assumption previously made, I posit that the level of formal independence that the legislators will chose for the NCA will be a function of the *cost of not delegating* for that particular country: the higher this cost, the higher the independence. Since an independent competition authority is supposed to embody the commitment of a government to treat all investors fairly and to offer a stable regulatory environment, not subject to political oscillations, the opportunity-cost of giving independence to the NCA is represented by how attractive the system is for investors *independent of* competition enforcement. Some may claim that it is not possible to disentangle attractiveness for investors from competition enforcement. I will argue the contrary.

A well-established approach for analysing different economic systems, the relationships between economic actors within them, and the institutions that countries develop in order to "secure the efficiency gains" (Hall and Soskice, 2001a: 18) yielded by the industrial and financial structure, is the "varieties of capitalism" (VoC) perspective (Hall and Soskice, 2001b; Hancké *et al.*, 2007b). This approach has proved to be a sound analytical tool and has found application in a wide range of issues in comparative political economy (see e.g. Watson, 2003; Brinegar *et al.*, 2004; Estevez-Abe, 2005; Hall and Gingerich, 2009). VoC is particularly useful for the present analysis because it offers two main advantages over other approaches: *a)* it analyses how some countries achieve efficient economic performance as well as institutional stability (which are exactly the aims of competition enforcement, but reached through a clearly different mechanism); and *b)* it focuses on institutional set-ups that have remained quite stable over the last 20 years (the time range in which most NCAs were established).

According to the VoC perspective, both coordinated market economies (CMEs) and liberal market economies (LMEs) are able to achieve better economic performance than "mixed market economies" (MMEs). The reason lies in their "coherence": while CMEs guarantee efficiency via negotiated salary moderation, highly centralized firm-union bargaining and moderate competition between firms, LMEs achieve similar results through a more decentralized labour market, a greater use of stock market capitalization, and higher competition between firms. Countries that share features of both types are usually defined as MMEs. This category has not been analytically developed so far, and scholars tend to use it both for "Mediterranean" (Molina and Rhodes, 2007) and for Eastern-European (Mykhnenko, 2007) economies. Mediterranean countries seem to have developed "specific kinds of capacities for non-market coordination in the sphere of corporate finance", while having "more liberal arrangements in the sphere of labour relations" (Hall and Soskice, 2001a: 21; Hall and Gingerich, 2009: 458). Another approach has highlighted that in these countries a *state-led model of coordination* lasted longer than in CMEs and LMEs (Thatcher, 2007: 154-156). Although it is difficult to argue that this set of features applies to all the countries that cannot be defined either as LMEs or as CMEs, MMEs can generally be considered as economies that do not fully benefit from the comparative advantages of the two main "varieties" of capitalism. Hall and Gingerich (2009: 465–473) have found empirical support for this claim, showing that higher rates of economic growth are associated both with high levels of market coordination

(LMEs) and with high levels of strategic coordination (CMEs).

Recalling the initial assumption – i.e. that politicians always prefer not to delegate in salient policy fields as long as they can – we can hypothesize that the tendency to delegate to NCAs may vary with respect to the type of economic system. Both LMEs and CMEs provide an economic environment that is *a)* more coherent and *b)* more efficient as regards its performance. Hence, politicians of these countries should be less in need of giving independence to their NCAs. On the other hand, legislators in mixed market economies face a higher cost for not sending a strong signal of commitment to competition to the market. Where coordination is weaker, legislators may try to compensate for this "comparative disadvantage" by setting up an independent NCA. Therefore, the hypothesis is that *mixed market economies will have more independent competition authorities than coordinated market economies and liberal market economies*.

DATA, OPERATIONALIZATION AND CONTROL VARIABLES

The dependent variable, in this empirical analysis, is the formal independence of the NCAs in the 27 EU member states. Data on all the known features of formal independence have been collected with a survey (see Appendix 1) that has been sent to all the agencies.[7] In order to build an index of formal independence, all the indicators drawn from the survey have been conflated into one. To do so, I have neither assigned the same weight to all the indicators, nor have I divided them into categories (appointment of the head, appointment of the board, relationship with parliament and government, etc.) and then given the same weight to all the categories (as was done in similar studies). Such arrangements, in fact, are arbitrary, and might lead the author to impose her/his own beliefs on the data, assigning weights and relevance according to her/his prior expectations. I have instead employed factor analysis to estimate the amount of the latent trait (independence, in this case) in each item. With this method, the weight of the items depend on how much they "adhere" to the latent trait common to all the variables across all observations.[8] To form the index, the items have been weighted according to their scores for the first factor.[9] The factor loadings of the items are shown in Appendix 2. Figure 1 presents all the competition authorities ordered according to the calculated independence index.

To test the hypothesis presented in the previous section – that LMEs and CMEs have less independent NCAs than MMEs – I employ data on the level of employer density, measured as the proportion of wage and salary earners in employment who work in firms organized in employers' associations. Such an indicator gives a very good estimate of the level of coordination among firms: the higher the number of firms in employers' association, the higher the level of coordination. These data have been retrieved from the ICTWSS database (Visser, 2011), which codes the institutional characteristics of trade unions, wage setting and other labour market features in 34 countries between 1960 and 2010.[10] For all the countries included in this analysis, the mean value in the period 1990-2009 has been calculated.[11]

If the hypothesis is confirmed, the relationship between employer density and independence should be "horseshoe-shaped". This means that with the following specification:

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_i^2 + \varepsilon_i$$

where Y is formal independence, X is the employer density and ε is the error term, β_1 should be positive and β_2 should be negative.

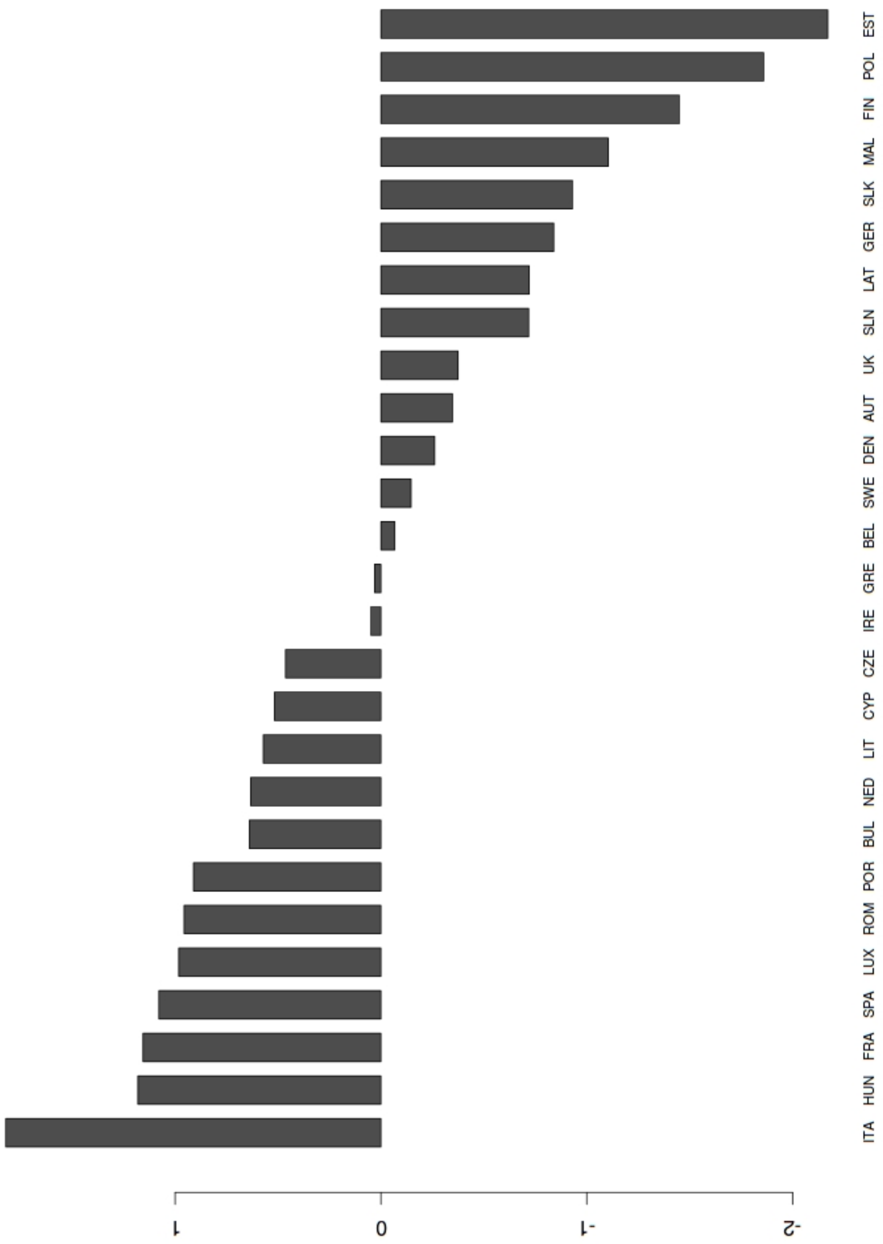

Figure 1: Formal independence of the 27 national competition authorities

Three control variables are also estimated in this model. The first is an indicator of political polarization, which measures, for each country, the dispersion of a distribution containing a left-right value for each executive from 1990 to 2008.[12] This indicator captures how much variation there has been among governments in office over this period. The reason for including this control is that greater polarization reflects in higher uncertainty about policy outcomes: high political distance gives rise to the risk that economic regulation may not remain stable over time (see Frye, 2002, 2010; Guardiancich and Orenstein, 2012). Since agencies are established exactly in order to mitigate these problems, political uncertainty should be positively correlated with formal independence – as has been proved, among others, by Gilardi, (2002, 2005a) and Wonka and Rittberger (2010).

The second control is the length of a country's EU membership, obtained by simply subtracting the year of accession to 2009 (when the survey data were collected). As said before, the EEC has been extraordinarily important in the diffusion of the principles of competition in the member states. Although there has never been a formal obligation to have a competition authority, many countries established agencies in response to EEC/EU politics (Börzel and Risse, 2003; Héritier, 1997; Kassim, 2003; Schmidt, 2001). In the field of competition policy, this process of Europeanization has been particularly intense (McGowan and Wilks, 1995; McGowan, 2005). As EU politics affect domestic politics also through informal channels (Checkel, 2005; Lewis, 2005; Radaelli, 2008) and via the creation of homogeneous epistemic communities (Lee and Strang, 2006; McNamara, 2002), older EU members are more likely to have been influenced by the importance assigned at the EU level to the principles of independence and impartiality related to competition enforcement. For this reason, I expect a positive effect of length of EU membership on formal independence of NCAs.

The third control is the year of establishment of the authority. Undoubtedly, the importance assigned to the use of independent agencies in regulation has grown substantially over the last 30 years, and independence of administrative agencies from the executive has become increasingly accepted in Europe and throughout the rest of the world (Gilardi, 2005b; Jordana and Levi-Faur, 2005; Levi-Faur, 2005). It is therefore plausible that NCAs established more recently have been granted more independence than “older” ones.

EMPIRICAL ANALYSIS AND DISCUSSION OF RESULTS

Dependent variable: Formal independence of NCAs	
EMPLOYER DENSITY	7.51 [0.55, 14.47]
EMPLOYER DENSITY *(squared)*	-6.50 [-12.61, -0.40]
POLARIZATION	0.90 [0.39, 1.41]
EU MEMBERSHIP	0.02 [0.01, 0.04]
YEAR OF ESTABLISHMENT	0.05 [0.01, 0.09]
Intercept	-101.89 [-173.10, -34.24]
Adjusted R^2	0.48
F	5.72

Method: linear regression. 95% confidence intervals in brackets.
F-value significant at <0.01. N=27.

Table 1: Linear regression model

The model illustrated above is tested with a linear regression analysis (see Table 1). The coefficient of the employer density indicator is positive, and that of its square is negative, as

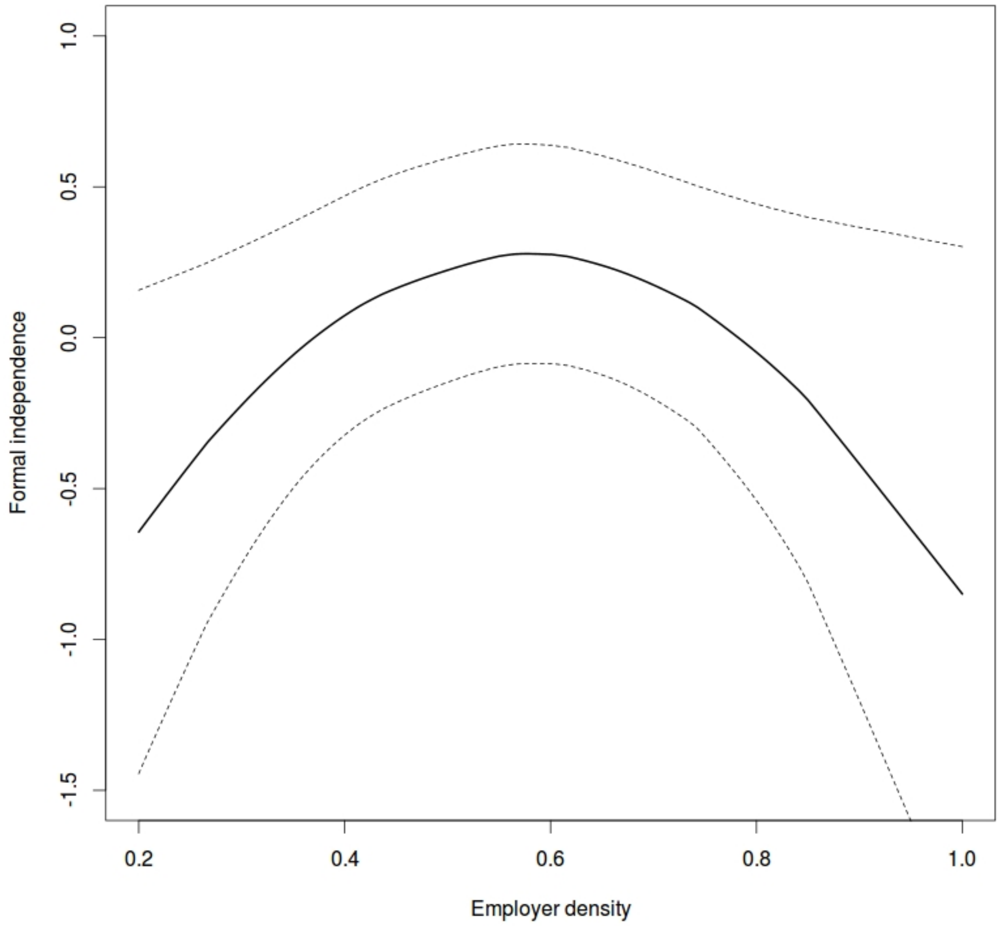

Figure 2: Estimated relationship between employer density and formal independence of NCAs. Dashed lines denote 95% confidence interval.

hypothesized. Countries with low and high employer density have more independent authorities than countries with mid-level employer density. The control variables' estimates are all positive, as expected. The model does not violate any OLS assumption: the standard errors variance is homogeneous[13] through the whole population and there are no suspicious outliers.[14] Therefore, the correlation between explanatory variables and dependent variable can be confidently interpreted.

The estimated relationship between employer density and formal independence of NCAs is illustrated in Figure 2.[15] As can be observed, the relationship is horseshoe-shaped, as hypothesized: higher degrees of independence are found among countries located at the centre of the distribution. Figure 3[16] provides a clear picture of the relationship between three of the variables included in the regression and formal independence of NCAs. Each value of the

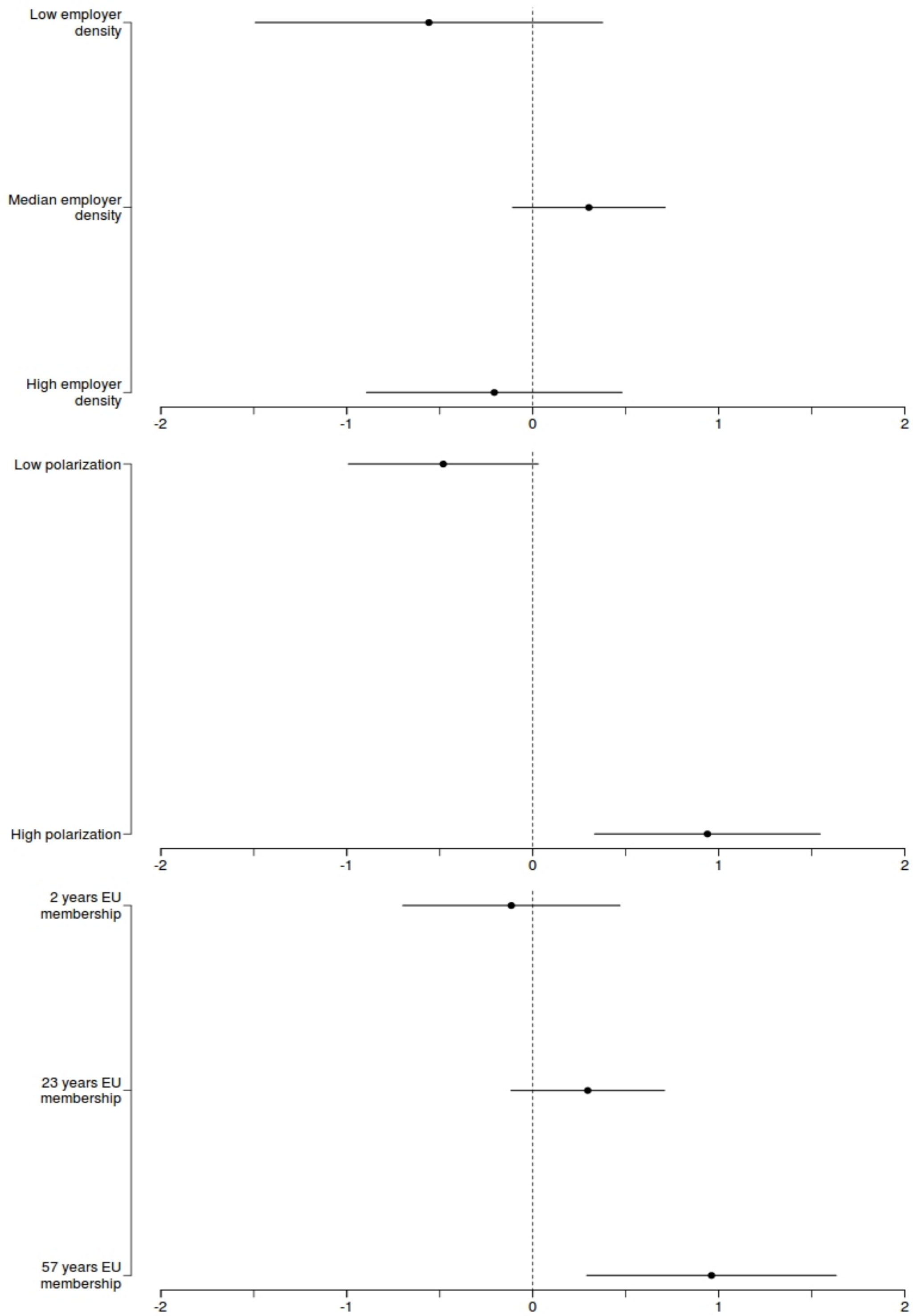

Figure 3: Expected values of formal independence of NCAs for different levels of the predictors

dependent variable has been estimated through 1000 bootstrapped simulations.[17] For every regressor, the values of NCAs' independence have been simulated setting the explanatory variable at different values while keeping all the others at their mean value.[18] As regards employer density, we notice again that the countries with an expected independence value below the mean are those having, respectively, high and low employer density. It is worth observing that, among the two extremes, NCAs in CMEs perform better than those in LMEs, in terms of formal independence. This may be due to the fact that, with regard to competitiveness and openness to investments, CMEs are perceived (or perceive themselves) as a less favourable environment than LMEs, given the importance they assign to strategic coordination between firms – a feature that might discourage foreign investors. The difference in formal dependence between the agency of an extreme LME and that of a country at the centre of the distribution is around 22%, while an extreme CME has, on average, a NCA that is 13% less independent than that of a median-employer-density country. Finally, the simulation shows that, according to the estimated regression, a shift from low to high polarization causes a relevant increase in formal independence (around 36%). Also the EU membership effect is remarkable: the oldest member states tend to have competition agencies that are 27% more independent than those of the most recent members.

CONCLUSIONS

In this article, I have shown that the independence of national competition agencies in the EU does not depend on the particular policy that they implement. A notable finding of this empirical analysis is that NCAs' independence does not even appear to be influenced by "ideological" constraints. As "coordination through competition" is the distinctive feature of liberal market economies, one would expect such countries to have more independent competition authorities, which would "secure" their advantage compared to coordinated and mixed market economies. Instead, the data show a different picture, with both CMEs and LMEs having less independent competition authorities than other countries. The explanation advanced and tested in this article partially disconfirms the expectation of VoC theorists that institutions should coherently follow the economic set-up, and firms' method of coordination in particular. The results indicate that, whatever the reason (which has to be further investigated), national competition authorities are not at the core of the institutional organization that distinguishes CMEs from LMEs. Either they are scarcely important in determining the investors' assessments on a country's profitability and reliability, or the politicians' interest in controlling competition policy enforcement prevails on economic efficiency concerns.

What we can certainly argue after this analysis is that independence of NCAs does not automatically correlate with the degree of "liberalism" of an economy – and this was not necessarily a predicted outcome. Countries that have been keener to adopt a neo-liberal agenda did not end up establishing more independent regulators. This highlights, first of all, that the rise of the regulatory state has not been a homogenous process, but rather a wave of reforms characterized by notable differences between countries. It also points out that the principal-agent framework has a good explanatory power when delegation and discretion are concerned. Most questions regarding regulatory independence can be analysed by considering the poiticians' incentives and disincentives to delegation, which depend on the policy field and on the ex-ante situation of countries.

The most important theoretical contribution of this article lies in its successful attempt to use a VoC perspective to explain institutional choices in which legislators are not passive translators of equilibriums reached by firms and other economic actors. An often noted drawback of the

VoC approach, at least in its earlier formulations, is that it is too functionalist (Allen, 2004; Howell, 2003) and it tends to underestimate the role of the state (Hancké *et al.*, 2007a: 23 ss.; Schmidt, 2009; Watson, 2003). In the theoretical framework presented in this article, instead, politicians do not necessarily make decisions that are coherent with the structure of firms' organization. They rather make use of comparative advantages of their economic systems in order to retain more control on certain policies – competition enforcement in this case. Analyses like this can enrich and expand the range of possible applications of VoC theory. Tests on delegation processes in other policy fields may shed new light on causal mechanisms that are still not easy to delineate. From an empirical point of view, it is of primary interest to ascertain whether politicians are correct in underestimating the impact of NCAs' independence. We have seen that only lawmakers in mixed market economies give considerable independence to competition regulators. Politicians in LMEs and CMEs are apparently confident that having a competition agency with little independence cannot harm their country's attractiveness among foreign investors. Is this belief sound? Does independence ultimately matter? This question, all in all, appears to be the real cornerstone of any critical assessment of the rise of the regulatory state.

ACKNOWLEDGMENTS

The author wants to thank Adrienne Héritier, Yannis Karagiannis, Igor Guardiancich and three anonymous CEP reviewers for their helpful comments.

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NOTES

[1] "Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings".

[2] EC Regulation 1/2003 prescribes that all the European competition authorities have to implement art. 101 and 102 of the Treaty on the Functioning of the European Union, which prohibit agreements restricting competition and abuses of dominant position.

[3] See, in particular, Article 3 of Regulation 1/2003.

[4] If

$$A = \langle A_1, A_2, \dots , A_{n-1}\ A_n \rangle$$

$$B = \langle B_1, B_2, \dots , B_{n-1}, B_n \rangle$$

$$i, j\ \in\ N\ [1; n]$$

and $A = f(B)$, then:

if $\forall\, A_i\colon A_i = A_i$, then $\forall\, B_j\colon B_j = B_j$.

[5] In this article, by the terms "legislators", "lawmakers" and "politicians", I will refer to members both of the parliament and of the government. As a matter of fact, especially in the countries studied here, it is impossible to attribute political decisions either to one body or to the other: in all the EU member states (except Cyprus), the government must have the confidence of the parliament, and distinguishing between the two makes little sense.

[6] As Koop (2011) has shown, regulatory agencies are more accountable (i.e. less independent) in highly salient policy fields.

[7] The survey, collected between September and December 2009, was mainly based on Gilardi's (2002; 2005) one, which was drawn from that of Cukierman *et al.* (1992). Some adjustments were also suggested by Hanretty and Koop (2012).

[8] The problems connected with the assumptions often made to construct these indices are discussed by Hanretty and Koop (2012). The factor analysis method, like all the others employed by other scholars, assumes that independence is uni-dimensional throughout the data. The index employed in the statistical analysis and another calculated with Gilardi's method are correlated at 89%.

[9] Factor analysis has been performed on a data set including all the variables drawn from the survey, using the principal-component factor method. Since there were some missing values (and factor analysis by default deletes all the observations with missing values), I needed to impute them using multiple imputation. The original dataset contained 99 missing values out of 1053 values (9%). However, it must be considered that 8 authorities had 9 missing values each because they do not have a board -- therefore, they could not answer the questions of the survey which regarded the board. If we exclude these 72 "inevitable" missing values, the missing values due to a lack of answer were only 27 (2.5%). The Multiple Imputation command (in PASW 18) has generated five imputed data sets. To obtain the matrix for factor analysis, I have calculated the mean across these five replications for every value in the data sets.

[10] This database was used because it contains data on all the EU member states – a requirement for this analysis.

[11] For some countries yearly data are not available. However, there is very little variation across time (the average coefficient of variation is very low, 0.04) among all cases. Therefore, missing values are little likely to bias the calculated mean value.

[12] The polarization value for each country is the standard deviation of this distribution, calculated with the formula

$$P = \sqrt{\frac{1}{n}\sum_{t=1990}^{2008}(LR_t - \mu LR)^2}$$

where:

LR_t is the left-right value, in a scale going from 0 (maximum left) to 10 (maximum right), for each country in year t;

μLR is the mean of this value across the period of interest.

n is the number of years included in the calculation.

The left-right position of each country's government for each year has been calculated as:

$$LR_t = \frac{1}{\sum_{x=1}^{n} S_x}\sum_{x=1}^{n} LR_x S_x$$

where:

S_x is the number of seats that party x holds in the parliament in year t;

LR_x is the left-right position of that party;

n is the number of the parties supporting the government in year t.

All the data for these indicators have been taken from the ParlGov database (http://www.parlgov.org) (Doering and Manow, 2010). The polarization index is a component of the "replacement risk" indicator developed by Franzese (2002).

[13] The studentized Breusch-Pagan test (Breusch and Pagan, 1979; Zeileis and Hothorn, 2002) reports a statistic of 5.10 with 5 degrees of freedom, which is significant at 0.32.

[14] The Bonferroni outlier test (Fox and Weisberg, 2010) does not indicate the presence of any p-value lower than 0.05 (the smaller Bonferroni p-value is 0.75).

[15] The graph in Figure 2 has been obtained by simulating expected values and standard

deviation for each permille of the employer density's distribution (10000 simulations for each permille). Simulations have been performed with the programme Zelig (Imai *et al.*, 2009) in R (R Core Team, 2012). For a discussion of the logic and the advantages of simulation over other post-estimation methods, see (King *et al.*, 2000).

16 The code for the graph in Figure 3 has been taken from one of the examples presented by (Kastellec and Leoni, 2007).

17 Bootstrapped simulations have been performed with the programme Zelig (Imai *et al.*, 2009) in R (R Core Team, 2012).

18 For the employer density indicator, the three values have been set, respectively, to the 5th, the 50th and the 95th percentile (0.22, 0.6, 0.85). For polarization, the two values have been set at the 5th and 95th percentile (0.45, 2.01). For EU membership, the three values have been set at the minimum, the mean, and the maximum (2, 23, 57).

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Appendix I

Survey on the formal independence of competition authorities

I – The Head of the Authority
1) Does the head of the authority have a fixed term of office?
Yes
No

2) If there is a fixed term, how long is it?
< 4 years
5 years
6 years
> 6 years

3) Who appoints the head of the authority?
One or two ministers
The prime minister
The government collectively
The government and the head of the state
The head of the state
The legislature
The presidents of the chambers
The legislature and the government combined

4) Does the law contain explicit provisions about the dismissal of the head of the authority?
Yes
No

5) Can the head of the authority be dismissed?
Can be dismissed for reasons related to policy
Can be dismissed only for reasons not related to policy
Cannot be dismissed

6) Does the law contain explicit provisions about the incompatibility of the head of the authority with other public offices?
Yes
No

7) Can the head of the authority hold other offices in government?
Yes, with permission of the government
Yes, in some cases specified by the law
No

8) Is the term of the head of the authority renewable?
Yes, more than once
Yes, once
No

9) Is political independence a formal requirement for the appointment of the head of the authority?
Yes
No

II – The board of the authority
1) Does the authority have a board?
Yes
No

2) Do the members of the board of the authority have a fixed term of office?
Yes
No

3) If there is a fixed term, how long is it?
< 4 years
5 years
6 years
> 6 years

4) Who appoints the members of the board of the authority?
One or two ministers
The government collectively
The government and the head of the state
The legislature
The presidents of the chambers
The minister consulting the head
The head of the authority

5) Does the law contain explicit provisions about the dismissal of the members of the board of the authority?
Yes
No

6) Can the members of the board of the authority be dismissed?
Can be dismissed for reasons related to policy
Can be dismissed only for reasons not related to policy
Cannot be dismissed

7) Does the law contain explicit provisions about the incompatibility of the members of the board of the authority with other public offices?
Yes
No

8) Can the members of the board of the authority hold other offices in government?
Yes, with permission of the government
Yes, in some cases specified by the law
No

9) Is the term of the members of the board of the authority renewable?
Yes, more than once
Yes, once
No

10) Is political independence a formal requirement for the appointment of the members of the board of the authority?
Yes
No

III − Formal relationship of the authority with the parliament and the government
1) Is the independence of the authority explicitly stated in the law?
Yes
No

2) What kind of autonomy is the authority granted? [multiple answers possible]
Decisional autonomy
Organizational autonomy
Financial autonomy

3) What are the formal obligations of the authority vis-à-vis the government?
The authority must present reports more than once a year for approval
The authority must present only one annual report that must be approved
The authority must present an annual report for information only
The authority has no formal reporting obligations

4) What are the formal obligations of the authority vis-à-vis the parliament?
The authority must present only one annual report that must be approved
The authority must present an annual report for information only
The authority has no formal reporting obligations

5) Who, other than a court, can overturn an authority's decision?
The government, in specific circumstances
A specialized body
None

6) What is the source of the authority's budget?
Government funding only
Fees levied on firms subjected to the authority's action and government funding

7) Who controls the authority's budget?
The government alone
Both the authority and the government
The accounting office or court
The authority alone

8) Who decides on the authority's internal organization?
Both the authority and the government
The authority alone

9) Who is in charge of the authority's personnel policy?
Both the authority and the government
The authority alone

IV − Other prerogatives of the authority
1) What are the powers of the competition authority vis-à-vis sectorial agencies in case of competence overlapping?
Sectorial agencies have priority over the competition authority
None has priority: agencies have to coordinate
The competition authority has priority over sectorial agencies

2) Does the authority have the power to set up its own rules of procedure in its activities?
No, never
Only in some activities
Yes, in every activity

3) Does the authority have the power to adopt precautionary measures during investigations?
No, never
Only in some domains of investigation
Yes, in every domain of investigation

4) What kind of sanctions can the authority impose?
It can impose fines
It can impose changes in the undertaking's governance
It can close the undertaking

Appendix II

Factor loadings of the items derived from the survey

Items	Factor loadings
Head of the authority	
Fixed term of office	0.54074
Length of the appointment	0.7124
Who appoints the head?	0.52324
Explicit provisions on the dismissal	0.30858
Possible to dismiss the head?	0.52974
Explicit provisions on incompatibility	0.69788
Is there incompatibility?	0.2862
Possible to renew the appointment?	0.57726
Independence as a requirement	0.19844
Board of the authority	
Is there a board?	0.3972
Fixed term of office	0.5977
Length of the appointment	0.70734
Who appoints the board?	-0.16664
Explicit provisions on the dismissal	0.08804
Possible to dismiss the board?	0.40354
Explicit provisions on incompatibility	0.5982
Is there incompatibility?	0.12164
Possible to renew the appointment?	0.50028
Independence as a requirement	0.26576
Relationship of the authority with parliament and government	
Explicit mention of independence	0.51224
Decisional autonomy	0.38512
Financial autonomy	0.41234
Organisational autonomy	0.30582
Obligations vis-à-vis the government	0.22466
Obligations vis-à-vis the parliament	-0.60202
Overturning body	-0.18006
Source of the budget	0.61944
Control on the budget	0.01436
Internal organisation	0.52756
Personnel	0.00392
Other prerogatives	
Powers in case of overlapping competences	0.188
Possibility to set up rules of procedure	0.64212
Possibility to adopt interim measures	0.28096
Possibility to impose sanctions	0.1178