Inter-Institutional Power in the European Union

Serguei Kaniovski * Frank Steffen †

October 13, 2017

Abstract

We study the power distribution in the ordinary legislative procedure of the European Union using van den Brink and Steffen's positional power measure for sequential voting procedures. We show that the Lisbon Treaty failed to equalize the powers of the European Parliament and the Council of Ministers, and left the European Commission the most powerful of the three institutions due to its agenda-setting prerogative.

Keywords: European Union, inter-institutional power, ordinary legislative procedure, positional power measure

*Austrian Institute of Economic Research (WIFO),
Arsenal, Object 20, 1030 Vienna, Austria.
Phone: +431 / 798 26 01 - 231
Fax: +431 / 798 93 86
E-mail: `serguei.kaniovski@wifo.ac.at`

†University of Bayreuth, Faculty of Law, Business and Economics,
Universitätsstraße 30, 95447 Bayreuth, Germany.
E-mail: `frank.steffen@uni-bayreuth.de`

1 Introduction

The Treaty of Lisbon sought to address an important element of the democratic deficit critique, which laments the weakness of the European Parliament (EP) relative to the Council of Ministers (CM) and the European Commission (EC). In the words of the EP:

> *'With a few exceptions, it would place the European Parliament (EP) on equal footing as lawmaker with the Council, representing the EU Member States, in areas where this has not been the case so far, notably in setting the EU budget (Parliament would enjoy full parity), agriculture policy and justice and home affairs.'*[1]

To redress the balance of power in the decision-making system of the European Union (EU), the Treaty of Lisbon elevated the co-decision procedure to the main law-making procedure, renaming it the Ordinary Legislative Procedure (OLP). It is claimed that

> *'The ordinary legislative procedure gives the same weight to the European Parliament and the Council of the European Union on a wide range of areas (for example, economic governance, immigration, energy, transport, the environment and consumer protection).'*[2]

We test whether this claim is justified using a formal power analysis of the OLP.

Despite the considerable amount of literature on power distributions within and between the governing EU institutions, a certain methodological schism exists. The analysis of power within the EU institutions (mainly the Council) is dominated by the use of *classical power measures*, a theory of which has been surveyed in Felsenthal and Machover (1998). These are based on the canonical membership-based approach (van den Brink and Steffen 2008), and aim to measure what is usually called *a priori power*, i.e. power granted by a set of decision-making rules (see, e.g., Felsenthal and Machover 2004, van den Brink and Steffen 2012). In contrast, the studies addressing the distribution of power between the EU institutions also account for the preferences of the actors and the expected outcomes of their strategic interactions using stochastic models (see, e.g., Napel and Widgrén 2011, Maaser and Mayer 2016). In these models, the distribution of preferences in relation to each other and the status quo becomes a crucial factor, making the power distribution dependent on the issue and the degree to which a particular actor supports the issue. For this reason, the notion of power addressed by these *preference-based (or strategic) power measures* is sometimes called *actual power*. While seemingly adding an element of realism, as argued in Felsenthal and Machover (2004) and, more forcefully, in Braham and Holler (2005b), these studies depart from what they claim to measure: power. The main point is that the measurement of power, with power being defined as a generic ability to effect outcomes despite resistance by other actors, must ignore any 'behavioral content' which conflates the possession of an actor's generic ability with its ableness, or the exercise of the actor's ability (p. 80 in Morriss 1987/2002). In other words, having power refers to an actor's possession of certain relatively enduring capacities, even if these capacities are never put into action. In game-theoretic parlance this means that the power of an actor resides exclusively in the actions that are available to the actor in a game, and not the way that the actor actually plays the game. This implies that power is a value-independent (payoff-independent) concept

[1] http://www.europarl.europa.eu/sides/getDoc.do?language=en&type=IM-PRESS&reference=20091005BKG61838.
[2] http://www.europarl.europa.eu/aboutparliament/en/20150201PVL00004/Legislative-powers.

(see, Braham and Holler 2005b). In particular, being disinclined to do something does not imply the inability to do it. This not only implies that the distinction between *actual* and *a priori power* is conceptually inappropriate, but that power studies based on presumed preferences and empirical investigations of stated preferences and actual collective outcomes may produce misleading results.[3]

What is missing is a proper study of the inter-institutional power distribution between the EU institutions: one that clearly exposes the effect of the intended constitutional arrangement, while also having a solid conceptual foundation – a study in the absence of prior knowledge about future issues, actors' preferences and their value-driven strategic interactions. While classical power measures are designed to abstract from such knowledge, their underlying membership-based approach is inapplicable to the measurement of power held by the EU institutions. Being based on the framework of a simple voting game, it does inherently presuppose a simultaneous decision-making procedure, while the decision-making procedure between the EU institutions is sequential. In contrast, the action-based approach to power measurement by van den Brink and Steffen (2008) is also applicable for the measurement of power under a sequential decision-making procedure. A key feature of the sequential decision-making mechanism involving the three EU institutions and many other sequential decision-making mechanisms is that they allow for a final decision to be reached at specific stages of the decision-making procedure. This implies that not all conceivable action profiles of the actors are permissible. Thus, the power of actors also depends on their position in the procedure. Based on their 'action-based approach', van den Brink and Steffen (2008) have developed a positional power score and measure which allows to incorporate these features without factoring possible distributions of actors' preferences or trying to account for the nature of issues on the ballots or the actors' value-driven strategic interactions. This absence allows us to evaluate the 'formal rules' at the constitutional level.

Following this introduction, in Section 2, we review the existing approaches to the measurement of power within and between the EU institutions through the prism of the theory of power. In Section 3, we describe the OLP as a sequential decision-making mechanism. In Section 4, we summarize the *action-based approach* and its usage for power measurement in sequential decision-making mechanisms. Furthermore, we explain its application to the measurement of power between the EU institutions. In Section 5, we present the results of our power calculations under the OLP, and the consultation procedure which the OLP has replaced as the main legislative procedure within the EU.

2 Existing Approaches to Measurement of Power in the EU

As already mentioned in the previous section, the literature on the distribution of power within the main EU institutions is dominated by the application of the *classical power measures* and based on 'formal rules' at the constitutional level. Moreover, these studies focus almost exclusively on the distribution of power within the CM. The *a priori* view underlying these studies can also be found in the literature on the appropriate distribution of voting weights in the tradition of the Penrose square root law (see, e.g., Felsenthal and Machover 2005, Kirsch, Machover, Słomczyński and Życzkowski 2013, Algaba, Bilbao, Fernández and López 2007). These contri-

[3] For a more detailed discussion, see Napel and Widgrén (2004) and the critique by Braham and Holler (2005b), as well as the reply by Napel and Widgrén (2005) and the rejoinder from Braham and Holler (2005a). For a critique of the application of power measures based on the canonical membership-based approach in the context of the EU, see Garrett and Tsebelis (2001).

butions aim to design a weighted voting system that achieves the 'one person, one vote' ideal for the EU citizens in the CM. Nevertheless, an important part of the theoretical discussion of the appropriate weight distributions departs from an *a priori* view by introducing individual preferences and a social welfare function for aggregating individual decisions into a collective decision. Existing studies advocate either proportional (Barbera and Jackson 2006) or digressively proportional (Koriyama, Laslier, Macé and Treibich 2013) voting weights in relation to the population of the member states in the CM.

In contrast, the literature on the distribution of power between the main EU institutions is dominated by the application of *preference-based (or strategic) power measures* (see, e.g., Steunenberg, Schmidtchen and Koboldt 1999, Napel, Widgrén and Mayer 2013), and, most recently, Maaser and Mayer (2016). These studies extend the underlying framework of the classical measures, which can be represented by a *game form* to a *game*. This allows the authors to extend their analysis to sequential decision-making mechanisms like the consultation and co-decision procedure in the EU by assuming a distribution of preferences of each institution around the status quo. Given a set of actor's preferences as points in the Euclidean space, they use a game-theoretic justification to determine the bargaining outcome, which is consistent with the asymmetric Nash bargaining solution.[4] Now assuming a distribution of the ideal points for each member state in the CM on the one hand, and the EP and EC on the other, allows approximating the probability of an institution, or a member state via the CM, being pivotal in bringing about the collective outcome. Conceptually, power is measured by the probability of being pivotal.

The conclusions drawn in the preference-based (or strategic) studies are close to dramatic. Their computations suggest that the CM has almost five times the power of the EP (0.57 for the CM vs. 0.12 for the EP), overwhelmingly favoring the CM over the EP, while also underscoring the proximity of the preferred policy point as the most important factor shaping the collective outcomes. Since the CM needs a qualified majority to reach a decision in the first reading, its position is frequently more conservative than that of the EP. This gives the CM considerable leverage in bargaining with the EP. This conclusion finds partial support in empirical studies based on the perceptions of the people involved.

Interviewing the politicians and other practitioners involved in the actual decision-making offers a unique source of insight into the influence of the three institutions in a sample of legislative decisions on a range of issues (Thomson, Stokman, Achen and König 2006). The practitioners gave arguments in favor of one institution being more powerful than another, which were then coded into numerical values. The resulting so-called *measure of influence* is a composite measure that includes quantities estimated from the data, such as the distance to the political status quo, that may be supplemented by a formal power computation using the classical power measures, as in Costello and Thomson (2013). Empirically informed measures, however, lack the theoretical and axiomatic foundations of the *a priori* measures, and are difficult to generalize. Conceptually, they are liable to critique that they conflate the possession of power with its exercise. The impression that most practitioners prefer to think in terms of power in particular policy areas (p. 397 in Thomson and Hosli 2006), rather than in general, suggests that what is being measured is not the power coded in the rules. Nevertheless, this study also reports that practitioners are well aware of the constraints on behavior imposed by the rules. This motivates an integrated approach to the measurement of power, of which the preference-based approach discussed above is a particular version.

[4]This holds with one exception: Napel et al. (2013) apply the Kalai-Smorodinsky solution.

Survey data are available for both the consultation procedure and the co-decision procedure. The results of these studies are based on survey data for the co-decision and the OLP. They indicate that the CM has more power that the EP, but also that the distribution of power greatly varies with the issues. Thomson and Hosli (2006) give the CM four times as much power as the EP in the co-decision procedure, and more than six times as much power as the EC. A recent study by Costello and Thomson (2013) gives 'the Parliament 20 percent of the Council's power in the co-decision procedure' (p. 1036) and confirms the bargaining advantage of being closer to the status quo for the CM, but not for the EP. This is consistent with the findings in Napel and Widgrén (2006) and Napel et al. (2013). Among other factors that are likely to influence the legislative outcome are how divided the EP is on the issue[5] and the degree of disagreement with the EC. Thus, the existing empirical studies confirm the stronger position of the CM, albeit to a much less dramatic extent than studies using the strategic power approach.

3 The Ordinary Legislative Procedure

The OLP is a sequential decision-making mechanism involving the three European institutions: the EC, EP and CM. The procedure starts with the EC submitting a legislative proposal. Since the EC can make proposals on its own initiative, the agenda-setting prerogative formally belongs to the EC. In a sequential decision procedure, the agenda setter can effectively reject a proposal by not submitting it. However, in practice, both the EP and the CM are likely to have a considerable impact on the agenda, and can even request a proposal. In some cases, other EU institutions such as the European Court of Justice, or the European Investment Bank can request a proposal. Proposals can also be submitted on a recommendation from the European Central Bank, or as a response to petitions by citizens' initiatives. Hence, it is reasonable to assume that the EC has – if at all – a restricted agenda setting power in the special cases. However, for our analysis we assume that the EC has either full control of the agenda, or none at all. Any other assumption on how proposals appear would take us beyond the *a priori* view on power and beyond the OLP as a set of decision-making rules.

The submission of a legislative proposal is the only action available to the EC in the OLP. Once a proposal is submitted, the EC plays no further role in the procedure. A proposal by the EC initiates a sequential decision procedure that involves one institution approving amendments made by the other, or making own amendments that need to be approved in turn, starting with the EP:

1. The EP can approve or amend the initial proposal, after which the proposal is considered by the CM. A proposal is finally adopted and becomes law if both institutions accept the initial proposal or the CM accepts the amendments by the EP. This concludes the first reading.

2. If instead the CM chooses to amend, the EP needs to approve the amendments in a second reading. At this point the EP may decide to finally reject or approve the proposal. If the EP instead chooses to amend the proposal in the second reading, the CM needs to approve these amendments again. This completes the second reading.

3. In case of a disagreement between the EP and the CM after the second reading, a Conciliatory Committee comprising representatives of the EP and the CM can be called to

[5]Which, contrary to the situation in the CM, is public information.

propose a joint amendment. The Committee may fail to come up with a joint amendment, in which case the procedure stops and the law is not enacted. If the Committee is able to formulate the final amendment, it requires approval by both institutions in the third reading, or it is ultimately rejected.

Figure A.1 summarizes the OLP as a decision tree, whose decision nodes represent the three institutions. The edges represent individual actions of the institutions. Depending on the institution and the current stage of the procedure, the actions can be: propose (P), approve (Y), amend (A), or reject (N). In the following, we will refer to the actions of approving and rejecting as *yes* and *no* votes, abbreviated to Y and N, respectively. With the exception of the EP in the second reading, all institutions face binary choices that may either lead to further actions or be final if they bring about an outcome. The outcome is binary: either the law is enacted (E), or the legislative proposal is rejected (R). The time axis at the bottom of Figure A.1 shows the five consecutive stages of the OLP. The procedure starts with a legislative proposal from the EC and may pass up to three readings.

The majority of the EU legislation enacted using the OLP is adopted after the first reading. Only about five percent of cases require the Conciliatory Committee and the third reading.[6] Equality of sizes of the two groups of representatives in the composition of the Committee compels us to assume parity between the EP and the CM in this body. Parity and consensus seeking has certainly been the intention behind this institution. Yet because both institutions can reject joint proposals of the Committee, as the EP has done in the past, we need to model the third reading explicitly. The joint proposal of the Committee is thus an amendment that requires the final approval of both institutions.

4 The Measurement of Positional Power

A collective *decision-making mechanism* (DMM) Γ consists of a decision rule and a decision-making procedure. A *decision rule* is a function which maps ordered sets of individual actions into outcomes, i.e., it states which ordered set of actions generates which outcome. A *decision-making procedure* provides the course of action of the actors for a collective decision and determines the actions to be counted, i.e., which actions go into the domain of the decision rule.

Traditionally, the application of the theory of voting power makes use of a simultaneous DMM Γ, which is represented by a *simple voting game* (SVG) and implicitly assumes a unique submission of an exogenous proposal. Hence, Γ is characterized by a finite set of actors: $N = \{1, \ldots, n\}$ with $n > 1$, binary action sets $A_i = \{Y, N\}$ with Y being the *yes* action which approves the proposal and N being the *no* action rejecting the proposal, and a binary outcome set $O = \{E, R\}$ with E being the *enacting* action leading to the proposal being enacted, and R being the *rejection* action leading to a rejection of the proposal. Subject to their individually chosen actions (votes), all actors are subdivided into two subsets (coalitions). Thus, a coalition is an 'index' of the actions of actors which have chosen the same action, where the decision rule determines which subsets are winning and losing. Being a member of the winning coalition means that the collective outcome corresponds to the individually chosen action of the member. Such a member is usually called *successful* or *satisfied.* Thus, the analysis is primarily based

[6]This figure holds for the sixth EP (2004-2009) and has decreased over the past. For example, during the fifth EP (1999-2004), some twenty percent of the legislature required a Committee.

on the membership of actors in coalitions (*membership-based* approach) and investigates how changes in this membership affect the status of the coalition. An alternative representation by making use of action profiles instead of coalitions (*action-based* approach), which also allows to model sequential DMMs, has been suggested by van den Brink and Steffen (2008). An action profile a is a 'path of moves' within the tree of the game form representing the DMM where the first move begins in the root and the last move ends at a terminal node. The set of all action profiles will be denoted by $\mathcal{A}^N$, and by $\mathcal{A}_i^N \subseteq \mathcal{A}^N$ we will denote the subset of all action profiles that contain an action of actor i (see van den Brink and Steffen (2008): 66 f.). Because in our case we face a sequential DMM, we make use of this approach, which allows to represent the DMM by an extensive game form.

For our generic definition of power, we follow van den Brink and Steffen (2008). The underlying approach is based on the philosophical analysis by Harré and Madden (1975) and Morriss (1987/2002), who define power to be a concept that always refers to a generic (and therefore, in a sense, timeless) ability of an object to effect (i.e., to force or accomplish) an outcome. In a social context this object is an actor. An actor i has power with respect to a certain outcome if i has an action (or sequence of actions), such that the performance of the action under the stated or implied conditions will result in that outcome despite the actual or possible resistance of at least some other actor. Hence, power is a claim about what i is able to do against some resistance of others, irrespective of its actual occurrence. It is a capacity or potential that exists whether it is exercised or not.[7]

Under the action-based approach, power in a DMM Γ is ascribed to an actor i if i has a *swing*. A swing occurs if, given the actions of the other actors, the actor i has the ability to alter the collective outcome $o(a, \Gamma) \in O = \{E, R\}$ by changing its originally chosen *action* $a_i \in A_i = \{Y, N\}$, despite possible resistance from others (represented by those chosen actions (votes) of the other actors which are not in line with the 'new' action of the actor in question):

$$\mathrm{POW}_i(a, \Gamma) = \begin{cases} 1 & \text{if } i \text{ has a swing in } a \\ 0 & \text{otherwise} \end{cases}.$$

We obtain a positional power score (PPS) by summing over the set of all action profiles containing actor i, $\mathcal{A}_i^N$:

$$\mathrm{PPS}_i(\Gamma) = \sum_{a_i \in \mathcal{A}_i^N} \mathrm{POW}_i(a, \Gamma) \quad \text{for each} \quad i \in N.$$

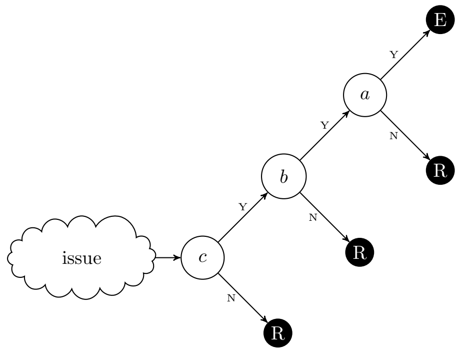
To obtain the positional power measure (PPM), we need to weight the power ascriptions by the probability of the occurrence of action profile a in Γ, denoted by $p(a, \Gamma)$.

$$\mathrm{PPM}_i(\Gamma) = \sum_{a_i \in \mathcal{A}_i^N} p(a, \Gamma) \cdot \mathrm{POW}_i(a, \Gamma) \quad \text{for each} \quad i \in N.$$

As already stated, for our analysis we require an approach which allows to model a sequential DMM as suggested by van den Brink and Steffen's (2008, 2012, 2014). Their action-based approach allows us to represent the DMM by an extensive game form (with perfect information),

[7] Note that power as an 'ability' implies that it can be exercised at 'will'. Power in this sense has to be distinguished from an ordinary dispositional power which only says what an object can do by virtue of its nature Harré and Madden (1975).

Figure 1: A sequential DMM 1/2.



Actions: Y-Yes, N-No.
Outcomes: E-Enaction, R-Rejection.

where actors are no longer always necessarily able to choose an action that enters the domain of the decision rule.

For an illustration, let us assume the following sequential DMM where only the single 'root actor' c is entitled to receive a binary proposal. The actor c has to decide whether to approve the proposal by choosing its *yes* action Y, or to reject the proposal by choosing its *no* action N. While the latter leads to the termination of the DMM and results in the unique final outcome that the proposal is rejected R, the former action results in forwarding the proposal to b, which entails that the outcome can still be *enacting* E or *rejection* R. If c chooses the *yes* action Y, the proposal has to be assessed by b who has the same options as c. If b chooses the *no* action N, the DMM is terminated and the outcome is *rejection* R, while choosing the *yes* action Y leads to forwarding the proposal to a for a final decision. In case of a, both available actions, the *yes* and the *no* action lead to a termination of the DMM with a unique outcome being the *enaction* of E if a chooses the *yes* action Y and *rejection* R if c chooses the *no* action N.

For this sequential DMM, we can identify the action profiles which are sufficient for bringing about an outcome: $\mathcal{A}^N = \{(Y,Y,Y),(Y,Y,N),(Y,N),(N)\}$, which are different from the set of action profiles under the membership-based approach assuming a simultaneous DMM:

$$\mathcal{A}^N = \{(Y,Y,Y),(Y,Y,N),(Y,N,Y),(N,Y,Y),(Y,N,N),(N,N,Y),(N,Y,N),(N,N,N)\}.$$

This also has an implication when it comes to the ascription of power to the actors in the different action profiles. As explained above, power is ascribed to an actor i, if, given the actions of all other actors, i has the ability to alter the collective outcome by changing its originally chosen action, i.e., if i has a *swing*. Under the membership-based approach – making use of simple games – due to the inherent simultaneous nature of the approach, such a unilateral alternation of the actor's individual action always leads to a new unique outcome. Hence, the new outcome set enforceable by the actor in question is – like the original one – a singleton. However, this no longer necessarily holds when decision-making is sequential. Under sequential decision-making it can happen that, by unilaterally altering its decision, an actor can effect a change in the outcome, but without the new outcome set being a singleton. For this reason, the analysis of sequential decision-making mechanisms distinguishes between a so-called *weak* and *strong* swing. The latter is ascribed to an actor if, by altering its action, the actor can alter the status quo and the new outcome set is a singleton: in our case, either $\{E\}$ or $\{R\}$. Instead, a weak swing is ascribed if the new set of subsequent feasible outcomes is not a singleton. Hence, a strong swing implies more power than a weak swing, as the outcome that a strong swing enforces is more specific. In the process of measuring power, we will aggregate both weak and strong swings, but in order to take into account the nature of the weak swings we only weight them with a factor $\epsilon \in (0, 1)$.

Table 1: A sequential DMM: Swings.

Actor	Action		Outcome	Swing Type
a	Yes→No	⇒	Enaction→Rejection	Strong
a	No→Yes	⇒	Rejection→Enaction	Strong
b and c	Yes→No	⇒	Enaction or Rejection→Rejection	Strong
b and c	No→Yes	⇒	Rejection→Enaction or Rejection	Weak

In the case of our example above, a has two strong and b and c each has one strong and one weak swing (Table 1).

$$\text{POW}_i^\epsilon(a, \Gamma) = \begin{cases} 1 & \text{if } i \text{ has a strong swing in } a \\ \epsilon & \text{if } i \text{ has a weak swing in } a \\ 0 & \text{otherwise} \end{cases} .$$

Hence, we obtain the following modified expressions for the PPS and the PPM:

$$\text{PPS}_i^\epsilon(\Gamma) = \sum_{a_i \in \mathcal{A}_i^N} \text{POW}_i^\epsilon(a, \Gamma) \quad \text{for each} \quad i \in N,$$

$$\text{PPM}_i^\epsilon(\Gamma) = \sum_{a_i \in \mathcal{A}_i^N} p(a, \Gamma) \cdot \text{POW}_i^\epsilon(a, \Gamma) \quad \text{for each} \quad i \in N.$$

For the calculation of the power measure we have to specify the weighting of the different action profiles $p(a, \Gamma)$. In order to determine the weights, we start with the assumption that each actor chooses each of its available actions with the same likelihood and independently of all potential previous decisions made earlier in the DMM: $p(a_i) = \frac{1}{\#A_i}$.

This equal likelihood and independence assumption are attractive in this combination on normative grounds, because this presumes the maximum freedom of choice for the actor, and also maximizes the entropy of the distribution on the set of all action profiles, therefore presuming the maximum freedom of choice for the voting assembly as a single entity. Hence, it can be regarded as the benchmark model to be used in constitutional design. Based on this assumption, the likelihood of the occurrence of an action profile a under a DMM is given by $p(a, \Gamma) = \Pi_{a_i \in a}\, p(a_i)$. Applying the above PPS^ϵ and PPM^ϵ to our example, Table 2 illustrates its calculation.

Table 2: A sequential DMM: Powers.

$p(a,\Gamma)$	Action Profile				Power					
	c	b	a	Outcome	c		b		a	
					weak	strong	weak	strong	weak	strong
0.125	Yes	Yes	Yes	Enaction		0.125		0.125		0.125
0.125	Yes	Yes	No	Rejection						0.125
0.250	Yes	No		Rejection			0.250ϵ			
0.500	No			Rejection	0.500ϵ					
PPS^{ϵ}					$1+\epsilon$		$1+\epsilon$		2	
PPM^{ϵ}					$0.125+0.500\epsilon$		$0.125+0.250\epsilon$		0.250	

In order to make van den Brink and Steffen's (2008, 2012, 2014) approach applicable to our setting, we need to extend their approach assuming a binary action set available to all actors. In the present case, in addition to the basic actions *yes* and *no*, two further basic actions come into play. This is to *propose* and to *amend* a proposal. Both actions have the special feature that their choice can never result in a final outcome, i.e., actors choosing these actions are always followed by at least one other actor with the common binary action set $\{yes, no\}$, where the choice of each action leads to a unique final outcome. Moreover, not all actions may always be available to all actors. In other words, the action sets may be asymmetric. In the case of our application, each actor in a specific decision node has three actions available at maximum. Extending the action set beyond the binary version implies that, in general, situations are feasible where an actor may have two or more options to alter its currently chosen action. As a consequence of this, following our definition of a swing, the actor in our case could also have a swing for two or, in general, even for more than two alternative actions. In line with the assumption made previously, i.e., that each actor behind a veil of ignorance chooses each of its actions with the same likelihood and independently of potential previous decisions made earlier in the DMM, we assume for the power ascription that an actor will switch to each of the alternatively available actions with the same likelihood.

Hence, we have to reformulate the formulas for the power ascription, score and measure to take this extension into account:

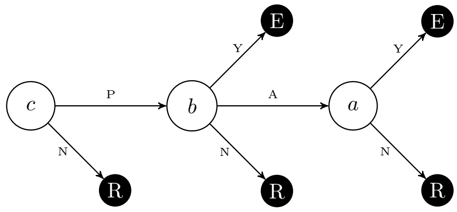
$$\overline{\text{POW}}_i^{\epsilon}(a,\Gamma) = \frac{1}{\#A_i^a - 1} \cdot \sum_{\bar{a}_i \in A_i^a \setminus \{a_i\}} \begin{cases} 1 & \text{if } a_i \to \bar{a}_i \text{ is a strong swing in } a \\ \epsilon & \text{if } a_i \to \bar{a}_i \text{ is a weak swing in } a \\ 0 & \text{otherwise} \end{cases},$$

where $A_i^a \subseteq A_i$ denotes the set of all available actions to actor i in its current position given action profile a, and $\#A_i^a - 1$ is the cardinality of A_i^a minus 1 for the currently chosen action a_i.

$$\overline{\text{PPS}}_i^{\epsilon}(\Gamma) = \sum_{a_i \in \mathcal{A}_i^N} \overline{\text{POW}}_i^{\epsilon}(a,\Gamma) \quad \text{for each} \quad i \in N,$$

$$\overline{\text{PPM}}_i^{\epsilon}(\Gamma) = \sum_{a_i \in \mathcal{A}_i^N} p(a,\Gamma) \cdot \overline{\text{POW}}_i^{\epsilon}(a,\Gamma) \quad \text{for each} \quad i \in N.$$

Figure 2: A sequential DMM 2/2.



Actions: P-Propose, Y-Yes, A-Amend, N-No.
Outcomes: E-Enaction, R-Rejection.

To illustrate this, assume the following example.

Assume a sequential DMM in which three actors, $N = \{a, b, c\}$, are involved. In terms of the procedure, c starts with its decision whether to submit a proposal. i.e., to choose the *propose* action P, or not, i.e., to choose the *no* action N. In the latter case, the DMM is terminated. If c makes a proposal, b has to decide whether to approve it, i.e., choosing the *yes* action Y, to reject it, i.e., choosing the *no* action N, or to amend it, i.e., choosing the *amend* action A. The choice of the *yes* action Y results in the final acceptance E and the choice of the *no* action N in the final *rejection* R of the proposal. Thus, in both cases the process is terminated. Only in the case of b choosing the *amend* action A is it up to a to finally decide on the amended proposal by choosing either the *yes* or *no* action. Again the choice of the *yes* action Y results in the final *enaction* E of the proposal, while the choice of the *no* action N leads to the final *rejection* R of the proposal. Hence, we have $A_c = \{N, P\}, A_b = \{Y, N, A\}, A_a = \{Y, N\}$ and $O = \{E, R\}$. The calculation of the $\overline{\text{PPS}}^\epsilon$ and $\overline{\text{PPM}}^\epsilon$ for the sequential DMM above is illustrated by Table 3.

Table 3: A sequential DMM: Powers.

$p(a, \Gamma)$	Action Profile				Power		
	c	b	a	Outcome	c	b	a
0.167	Propose	Yes		Enaction	0.167	$0.083 + 0.083\epsilon$	
0.083	Propose	Amend	Yes	Enaction	0.083	0.083	0.083
0.083	Propose	Amend	No	Rejection		0.083	0.083
0.167	Propose	No		Rejection		$0.083 + 0.083\epsilon$	
0.500	No			Rejection	0.500ϵ		
$\overline{\text{PPM}}^\epsilon$					$0.250 + 0.500\epsilon$	$0.333 + 0.167\epsilon$	0.167

5 The Power Distribution in the OLP

The action profiles in the OLP are shown in Table 4. An action profile comprises ordered subsets of the set of individual actions, where in the case of the OLP it is feasible for the EP and CM to have more than once action in an action profile. Each action profile terminates in a final decision that brings about a collective outcome shown in the rightmost column. The probability distribution on the set of all action profiles is shown in the second column. Whether the EP decides to approve the initial proposal of the EC in the first reading or amend it does not change the probability of the action profile. The factor 1/3 enters the computation of the probability because the EP faces a ternary decision in the second reading, it may finally approve or reject the legislation, or amend and pass it to the CM. The sooner a final decision is reached, the shorter the sequence of actions will be. The shortest sequence has one action only, which is choosing the *no* action N by the EC. If we remove the EC as the agenda setter, the table of profiles would lose the first row and the first column, while the remaining probabilities would have to be divided by 1/2.

The actions and outcomes belonging to the Conciliatory Committee and the 3rd reading are aggregated under an assumption of equal influence of the EP and the CM at this stage. The Committee can only make a joint proposal if both institutions agree, after which they will vote on the joint proposal simultaneously. The legislation is passed if both agree. This assumption of parity between the EP and CM, and the requirement of consensus and unanimity at this final stage of the process was already mentioned at the end of Section 3.

The first step towards computing the powers of the three institutions lies in the identification of the action profiles implied in the OLP (Table 4).[8]

Table 4: Action profiles in the OLP.

			1st reading		2nd reading		3rd reading		Outcome
#	Weight	EC	EP	CM	EP	CM	EP	CM	
1	1/2	N							R
2	$1/(3 \cdot 2^2)$	P	Y/A	Y					E
3	$1/(3 \cdot 2^2)$	P	Y/A	A	Y				E
4	$1/(3 \cdot 2^2)$	P	Y/A	A	A	Y			E
5	$1/(3 \cdot 2^3)$	P	Y/A	A	A	N	Y	Y	E
6	$1/(3 \cdot 2^5)$	P	Y/A	A	A	N	Y	N	R
7	$1/(3 \cdot 2^5)$	P	Y/A	A	A	N	N	Y	R
8	$1/(3 \cdot 2^5)$	P	Y/A	A	A	N	N	N	R
9	$1/(3 \cdot 2^2)$	P	Y/A	A	N				R

Actions: P-Propose, Y-Yes, A-Amend, N-No.
Outcomes: E-Enaction, R-Rejection

The second step identifies the weak and strong swings (Table 5).

[8]In Table 4, the notation Y/A in the first reading by the EP indicates that it does not matter for the next stage of the process if for the initial proposal in the first reading the EP has chosen the *yes* action Y or the *amend* action A, as the CM will have a say in either case.

Table 5: Weak (w) and strong (s) swings in the OLP.

				1st reading				2nd reading				3rd reading			
		EC		EP		CM		EP		CM		EP		CM	
#	Weight	w	s	w	s	w	s	w	s	w	s	w	s	w	s
1	$1/2$	✓													
2	$1/(3 \cdot 2^2)$		✓			✓									
3	$1/(3 \cdot 2^2)$		✓				✓	✓							
4	$1/(3 \cdot 2^2)$		✓				✓		✓	✓					
5	$1/(3 \cdot 2^3)$		✓				✓		✓		✓		✓		✓
6	$1/(3 \cdot 2^5)$						✓		✓		✓				✓
7	$1/(3 \cdot 2^5)$						✓		✓		✓		✓		
8	$1/(3 \cdot 2^5)$						✓		✓		✓				
9	$1/(3 \cdot 2^2)$						✓	✓							

The final step yields the power distribution based in the positional power measure ($\overline{\text{PPM}}^{\epsilon}$) in Table 6. The results show that the institutional reform in the EU has strengthened the EP, but failed to equalize the power of the Parliament to that of the Commission. In the OLP, just taking into account the CM and EP, the CM has roughly two times the power of the EP. If we additionally account for the agenda-setting prerogative of the EC, then the remaining power is again shared roughly 2/1 in favor of the CM. We conclude that, while the EP has gained power in the transition from the Treaty of Nice in which it had no power under the consultation procedure, it is still not nearly as powerful as the CM. Our findings corroborate the results of the preference-based analysis in Napel and Widgrén (2006), and Napel et al. (2013), as well as the empirical results based on interviews of the politicians involved in the actual decision-making in Thomson and Hosli (2006) and Costello and Thomson (2013). Thus, if we ascribe agenda-setting power to the EC, then it is formally the most powerful of the three institutions.

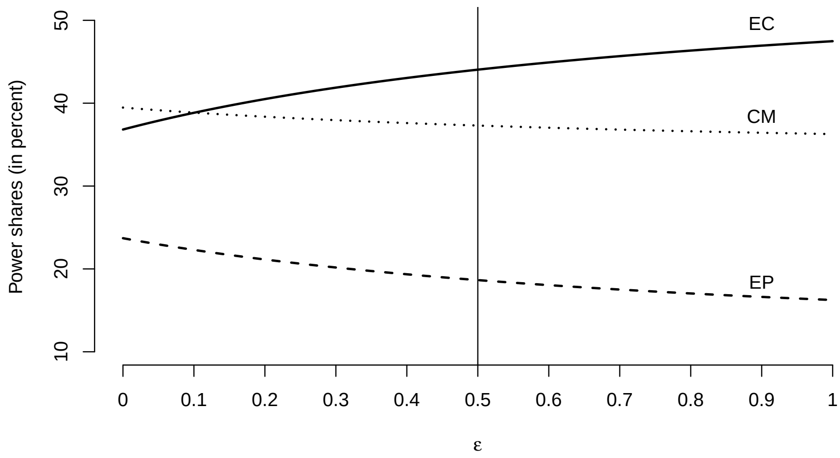
Table 6: The power distribution in the OLP according to the $\overline{\text{PPM}}^{\epsilon}$.

Institution	Positional Power Measure ($\overline{\text{PPM}}^{\epsilon}$)				Napel et al. (2013)	
	EC is an agenda-setter		EC is no agenda-setter		EC is no agenda-setter	
EC	$0.292 + 0.500\epsilon$	$\approx 44\%$	–	–	–	–
EP	$0.188 + 0.083\epsilon$	$\approx 19\%$	$0.375 + 0.167\epsilon$	$\approx 33\%$	0.115	$\approx 17\%$
CM	$0.313 + 0.292\epsilon$	$\approx 37\%$	$0.625 + 0.583\epsilon$	$\approx 67\%$	0.570	$\approx 83\%$

The percentage distribution assumes $\epsilon = 0.5$.

The power calculations in Table 6 assume $\epsilon = 0.5$. The value of ϵ gauges the importance of weak swings relative to strong swings. Since the power measure counts strong swings, it is reasonable to confine this parameter to the unit interval. Setting $\epsilon = 1$ then equates weak

Figure 3: Sensitivity of the power distribution w.r.t. ϵ



swings to strong swings, and $\epsilon = 0$ discards weak swings entirely. Setting $\epsilon = 0.5$ is a natural choice for *a priori* power measurement. It is nevertheless instructive to conduct a sensitivity analysis of the power distribution with respect to ϵ, because the power distribution depends on ϵ non-linearly. Being a ratio of two linear functions, the individual power share is a hyperbolic function of ϵ.

Figure 3 shows the effect of ϵ on the power distribution among the three institutions. Higher values of ϵ monotonically increase the power share of the Council at the expense of the other two institutions. For $\epsilon = 0.5$, the power distribution of 44 percent (EC), 19 percent (EP) and 37 percent (CM) is given in the second column of Table 6. Depending on ϵ, the power shares can range from 37 percent (EC), 16 percent (EP) and 36 percent (CM), to 47 percent (EC), 24 percent (EP) and 39 percent (CM), with power inequality expressed by the Gini coefficient monotonically increasing from 0.11 to 0.21 as ϵ increases from zero to one. Increasing ϵ from zero to one roughly doubles the power inequality as measured by the Gini coefficient.

Acknowledgment: We would like to thank Sascha Kurz, Alexander Mayer, Stefan Napel, and Marina Uzunowa for their comments. Forerunners of this paper have been presented in the research seminar of the MODUS Research Center at the University of Bayreuth (June 2014), at the 2014 European Meeting on Game Theory (SING10) in Krakow (July 2014), and at the 27th European Conference on Operational Research (EURO2015) in Glasgow (July 2015).

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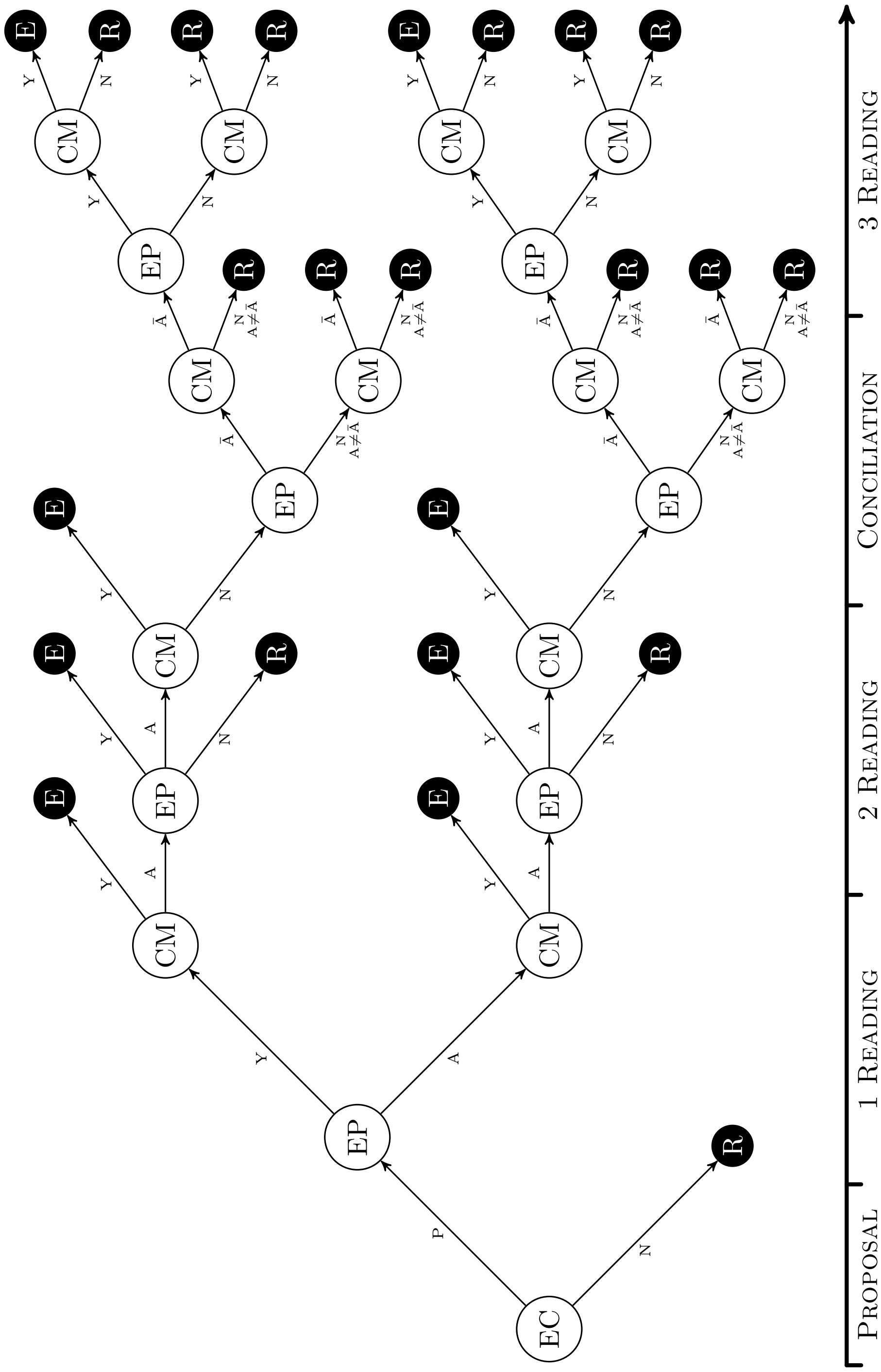
Figure A.1: The Ordinary Legislative Procedure (OLP)



Actions: P-Propose, Y-Yes, A-Amend, N-No.
Outcomes: E-Enaction, R-Rejection.