ABSTRACTS OF PAPERS

Note that in many instances the following abstracts summarise works that are in various stages of completion. Please do not quote without consulting the author(s).

Claus Beisbart

How to Make a Difference – Measures of Voting Power Revamped

Claus Beisbart and Luc Bovens

Voting power (i-power) measures the extent to which a vote can make a difference to the outcome of a collective decision. And a voter has the opportunity to make a difference, if the following counterfactual is true: Had the vote been different, the outcome of the collective decision would have been different. In the philosophical literature, several interpretations of counterfactuals have been suggested. One of them leads to the probability that a vote is critical and thus (if the Bernoulli model is adopted) to the Banzhaf measure. But there is arguably a more plausible interpretation of counterfactuals according to which counterfactuals trace causal connections. We provide a measure of voting power that is based on this very interpretation. The measure makes use of probabilistic causal networks. We motivate and define the measure, provide simple examples, and discuss the relation to the Banzhaf measure. We conclude by suggesting how the measure may be used for quantifying the responsibility of a voter.

Veronika Belousova

Cost Efficiency and Shareholders' Voting Power in Russian Banking

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The paper investigates the relation between cost efficiency and type of governance in the top-100 Russian commercial banks. As cost efficiency measures we use **a)** cost efficiency scores obtained by stochastic frontier approach, which takes into account indicators of risks; and **b)** performance index such as interest expense to interest income ratio. Concerning the governance type, our classification is based on voting power distribution of the banks' shareholders, the idea first developed in Cubbin & Leech (1983). We use the classical Banzhaf and Shapley-Shubik power indices as well as the approach of preference-based power indices from Aleskerov (2006) that assesses power using pairwise preferences of voters to form coalitions.

Our preliminary results indicate that cost efficiency scores of the Russian banks have been decreasing during 2006-2007. We also conjecture that the banks which have a less concentrated distribution of shares are in general more cost efficient than those with a high concentration of shares. We applied several classifications of banks using various power indices.

While the results are robust to the choice of a power index, the best explanation is based on the ratio of the normalized Banzhaf power index of the largest shareholder to her share.

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Luc Bovens

Minimizing the Threat of a Positive Majority Deficit in Two-Tier Voting Systems with Equipopulous Units

Luc Bovens and Claus Beisbart

Let us suppose that there is a two-tiered voting system in a company, a country, or a federation with n people partitioned in m equi-populous constitutive units. We institute simple majority voting at both levels and postulate a Bernoulli voting model.

We are interested in the sensitivity and the mean majority deficit for different types of partitions. Clearly, if there is only one unit or if there are as many units as there are people, then we have a one-tiered voting system with maximal sensitivity and a mean majority deficit of zero. Our question is: What is the partition that yields the undesirable feature of minimal sensitivity and maximal mean majority deficit?

We find the following results: For odd n, minimal sensitivity and maximal mean majority deficit occurs when m is close to the square root of n. For even n, minimal sensitivity and maximal mean majority deficit occurs when m is 2 or $n/2$. We relax the assumption of equi-populous units and conclude with a discussion of the political relevance of our findings.

Matthew Braham

An Anatomy of Moral Responsibility

Matthew Braham and Martin van Hees

Can we attribute moral responsibility in cases of joint action, that is, when states of affairs are engendered by the actions of two or more individuals? Thompson (1980) has argued that it is often very difficult to do so and has christened this `the problem of many hands'. More recently, Pettit (2007)} claims to have found a `problem of no hands', in which it is possible to say that a collective agent is morally responsible for bringing about an outcome but none of its constituent members are. In this paper we argue that such `in principle' conclusions and existential pointers to shortfalls in individual responsibility are too quick. They arise primarily for a methodological reason: the appropriate formal analysis has not been undertaken. To trace the connection between individual agency and outcomes that arise from a complex of interactions we make use of a game theoretic framework. We show how individual responsibility can be described in such a framework, and examine the formal conditions under which responsibility assignments can be made.

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Shanti Chakravarty

Royal Bank of Scotland Fiasco: Exit, Voice or Loyalty?

S. P. Chakravarty[1] and L. Hodgkinson[1]

This paper proposes to investigate the dynamics of changing ownership structure of the Royal Bank of Scotland, starting with the period of the controversial decision of RBS management for the acquisition of the Dutch banking group ABN Ambro. The above controversial acquisition is blamed on an overbearing management, and the decision to push through this merger is considered to be one of the reasons for the demise of RBS. However, there appears not to have been any strong outward expression of organised dissent from shareholders at the time of the acquisition. We propose to investigate the structure of shareholding to ascertain if the shareholders could have attempted to challenge management by exercising franchise or whether exit was the only viable option. The fact that there was no exit of large shareholding groups around the time of the merger is a puzzle that will also be examined.

JEL Classification: Corporate Governance, Mergers, Voting Power, Condorcet Jury Theorem

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Criticality in Games with Multiple Levels of Approval

Sreejith Das

In this paper criticality within a voting game is rigorously defined and examined. Criticality forms the basis of the traditional voting power measures frequently employed to analyse voting games; therefore understanding criticality is a pre-requisite to understanding any such analysis. The concept of criticality is extended to encompass games in which players are allowed to express multiple levels of approval. This seemingly innocuous extension raises some important questions, forcing us to re-evaluate exactly what it means to be critical. These issues have been largely side-stepped by the main body of research as they focus almost exclusively on "yes/no" voting games, the so called single level approval voting games. The generalisation to multilevel approval voting games is much more than just a theoretical extension, as any single level approval game in which a player can abstain is in effect a multilevel approval voting game.

Dan Felsenthal

A Note on Measuring Voters' Responsibility

Dan Felsenthal and Moshé Machover

We consider a singular event of the following form: in a simple voting game, a particular division of the voters resulted in a positive outcome. We propose a plausible measure that quantifies the causal contribution of any given voter to the outcome. This measure is based on a conceptual analysis due to Braham (2008), but differs from his solution to the problem of measuring causality of singular events.

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Grant Hayden

Arrow's Theorem and the Exclusive Shareholder Franchise

Grant Hayden and Matthew Bodie

In this paper, we contest one of the main arguments for restricting corporate board voting to shareholders. The doctrine of shareholder primacy sits at the center of American corporate law. And shareholders do, in fact, have primacy of place within the corporation, as they alone generally have the right to elect the firm's directors (other constituents—such as employees, creditors, suppliers, and others affected by corporate decision-making—do not have the right to vote). In justifying the limitation of the franchise to shareholders, scholars have repeatedly turned to social choice theory—specifically, Arrow's theorem—to justify the exclusive shareholder franchise. Citing to the theorem, corporate law commentators have argued that lumping different groups of stakeholders together into the electorate would result in a lack of consensus and, ultimately, the lack of coherence that attends intransitive social choices, perhaps even leading the corporation to self-destruct.

We contend that this argument from Arrow's theorem makes very little sense. First, we argue that commentators have overestimated the concerns raised by the theorem about the aggregation of more diverse preferences. Almost any time that different viewpoints are converted into social choices, disparate preferences must be reconciled. In fact, the only way around this would be to assume that shareholders will never disagree—increasingly a flawed premise. More importantly, the shareholder primacy argument misreads the import of the theorem—namely, that any voting system will fail to achieve perfection and thus we must confront the weaknesses of the particular system at hand. The shareholder franchise, like any other system, may avoid violating one of the conditions of Arrow's theorem only by violating another—a tradeoff that has never been explicitly acknowledged or defended. Ultimately, we argue that Arrow's theorem fails to support shareholder primacy or the limitation of corporate voting rights to shareholders.

Roland Kirstein

Volkswagen vs Porsche:
A Power-Index Analysis

Roland Kirstein

The supervisory board of Porsche SE, after a successful takeover of Volkswagen AG, was supposed to consist of three groups: The Porsche shareholders would have been endowed with 6 seats, while the 324,000 Volkswagen employees and the 12,000 Porsche employees would have been represented by 3 delegates each. This paper perceives each of these three groups as unitary players and presents a power-index analysis of this supervisory board. It shows that, unless the Porsche employees are made completely powerless, the Porsche and VW employee representatives will have identical power regard- less of the actual distribution of seats on the employees' side. This analysis sustains the judgment issued by a German labor court that rejected the request of the Volkswagen works council for more seats than the Porsche employees in the supervisory board of Porsche SE. The request for a more adequate representation can only be granted if a "randomized decision rule" is introduced.

The Square Root Rule: An Enduring Misconception

Annick Laruelle

(Based on *Voting and Collective Decision-Making. Bargaining and Power*, Cambridge University Press, 2008, co-authored with F. Valenciano)

The so called "Square root rule" (SQRR) enjoys the credibility of a solidly established scientific conclusion among some researchers. The purpose of this presentation is to show the lack of such a solid basis.

The SQRR prescribes for a committee in which each member acts of behalf of a group of different size a weighted majority voting rule in which each member has a Banzhaf index proportional to the square root of the size of the constituency he/she represents. This recommendation is based on five pillars:

1. **The two-stage model**: An idealization according to which each committee member votes in accordance with the majority opinion in his/her group.
2. **The a priori probability model** (also known as the "Independent Culture" model): motivated by a "veil of ignorance" approach normatively oriented, it is assumed that all vote configurations are equally probable.
3. **Power is the issue**: It is accepted as obvious that power is the main issue in a voting situation.
4. **Power = decisiveness**: The plausible intuition that "power" is the capacity to influence supports this axiom.
5. **Fairness requires an egalitarian distribution of power**. It is then proved that, if the groups' sizes are large enough, the above described SQRR ensures that, with great approximation, any two citizens of any two different groups have the same power as measured by the Banzhaf index, i.e. the same probability of being decisive. Thus the SQRR seems to implement the egalitarian desideratum quite satisfactorily.

Nevertheless it is the absolute lack of clarity relative to what kind of voting situation one is talking about that makes appear the SQRR as a plausible logical consequence of the five "reasonable pillars" above. On the contrary, if one further specifies the situation, as a reference term **two quite different types of voting situation** can be considered:

1. **A take-it-or-leave-it committee (TOL)**, where the proposals are submitted to the committee, which can only accept or reject each proposal separately by vote, without room for negotiations or modifications of the proposal.
2. **A bargaining committee (BC),** where the above conditions do not hold, so that negotiation is possible.

Here we mainly concentrate in the first type of situation. Apart from a question of time constraints, in this type of situation at least some of the above

five "pillars" make sense and hold up. Namely, pillars 1 and 2 can be accepted as reasonable pieces for a model with normative purposes in a take-it-or-leave-it committee. As to pillar 3 and 4, it must be said that the very notion of power is illusory in this type of situation: Power for what? A voter faced with the prospect of an issue to be decided by vote will care about the result (winning or losing), not about the likelihood of being decisive. Thus a rational voter will vote 'yes' or 'no' according to his/her preferred outcome. In other words: in such a situation *behavior, i.e. actions, follow immediately preferences*. Therefore the situation is not game-theoretic, so that the probabilistic approach makes sense. In a vote of this type to be or no to be decisive, or to have been or not to have been decisive is irrelevant if no practical use can be made of it. Only the superficially plausible equation "power = decisiveness" endorses attaching particular value to it in these conditions. A more sensible approach based on utilities or expected utilities would replace pillars 3 and 4 by this:

3'. The issue is about utilities: In other words, the issue at stake is to have or not the preferred outcome: acceptance or rejection.
And pillar 5 (replacing "power" by utility) should be replaced by

4'. Egalitarianism requires equal expected utility for all voters.
In order to formalize this assumption some specification about the utilities of the voters is necessary. Then 3' can be combined with pillars 1 and 2 and 4', and the question of the rule for which any two citizens of any two different groups have the same *expected utility* can be raised. It turns out the SQRR implements this with great approximation.

So what? Is this just a confirmation of the virtues of the SQRR from a different point of view? No, this only contributes to prolong the misunderstanding offering its partisans a second line of defense. To see this, consider that the exact SQRR requirement is never achieved in real world applications. Then the evaluation of the "distance" from strict egalitarianism is completely different form either point of view. For instance, in the case of the European Council, the model based on power (i.e. on the five pillars) yields for citizens an extremely tiny probability of being decisive in the two stage model, but attaches a great importance to the differences (in relative terms) between such probabilities for citizens of different countries. This is consistent with the idea that, however small, power and difference in power is what matters. On the contrary when comparisons are made from the point of view of utilities it turns out that, given assumption 2, the marginal utility due to the rule (due to each voter's "power" in fact) is extremely small, that is, the expected utility of any voter of any group (once utilities are normalized to make comparisons sensible) is *almost independent of the voting rule*. On the contrary, if the egalitarianism of pillar 5 or its alternative 4' is replaced by utilitarianism (maximazing the aggregated utility) and then the rule really matters and supports the so called *second* square root rule on clear utilitarian terms.

When confronted with these arguments some partisans of the SQRR argue that the specifications of our 'take-it-or-leave-it' scenario are very seldom met in real world. But in this case, that is, when the voting situation leaves room for negotiation, then the whole SQRR scaffolding collapses: The two-stage model ceases to make sense (pillar 1); actions do not follow preferences trivially and the a priori probabilistic model is not justified nor any pure probabilistic

approach (pillar 2); even though now the question of power can meaningfully be posed, again power is not the primary issue (pillar 3). Only pillar 4 keeps part of its meaning and 5 can be soundly approached, but not surprisingly the answer is even further from the SQRR.

Nicola Maaser

More on Equal Representation
in Two-Tier Voting Systems

Nicola Maaser and Stefan Napel

For the egalitarian reason that each bottom-tier voter should, in principle, have the same indirect influence on top-tier decisions, delegates have voting weights which increase in the size of their constituency in many assemblies. An earlier Monte-Carlo study (Maaser and Napel, Social Choice & Welfare 28: 401–420, 2007) demonstrated that weights proportional to the square root of population sizes come close to ensuring equal representation in a unidimensional spatial voting framework given a 50% decision quota. This paper provides an analytic explanation for this finding. It investigates sophisticated weight allocation rules, which use conventional power indices, and shows that even these fail to extend to quotas q > 50%. More critically, if voters are subject to constituency-specific shocks then, for arbitrary q ≥ 50%, a linear rule based on the Shapley-Shubik index outperforms square root rules. This raises the important normative question: which kind of inter-constituency heterogeneity shall be acknowledged behind a constitutional 'veil of ignorance'?

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Iain Paterson

Unifying EU Representation at the IMF Executive Board:
A Voting and Veto Power Analysis

Peter Brandner, Harald Grech, Iain Paterson*
(Preliminary – not to be quoted, June 26, 2009)

To analyze the consequences of consolidating EU representation at the IMF, we regroup the 27 EU Member States into a euro area EU constituency and a non-euro area EU constituency (based on the IMF's new quota formula) and calculate voting power measures as proposed by Penrose-Banzhaf (PBI) and Shapley-Shubik (SSI). For theoretical reasons and empirical plausibility arguments, we favor the results based on the SSI. Concerning the Executive Board, our results confirm the PBI-based evidence in the literature, as we find the two large constituencies (U.S.A and euro area) to have more voting power than their voting shares indicate. Above majority thresholds of 67%, the PBI and SSI results become increasingly divergent, with the difference being most pronounced at the majority threshold of 85%, at which the PBI has already plunged dramatically whereas the SSI remains more or less constant. Regarding the blocking power analysis, comparison of the current structure of the Executive Board shows that the Coleman~PBI yield high estimates of blocking probability compared to the Paterson~SSI. The efficiency of making collective decisions is likewise considerably lower for Coleman~PBI than for Paterson~SSI, and we show the implausible source of the former pessimistic estimate. Concerning the Board of Governors, we find voting power to depend on both EU-related decision rules and the power measure used. If decision-making within the group is based on EU Council votes, smaller EU Member States tend to gain voting power and would hence have an incentive to push EU consolidation. On the contrary, most of the larger EU Member States tend to lose voting power and might consequently be inclined to retain the status quo. However, above all by bundling individual euro area concerns, a consolidated euro area representation would act as a booster for the euro area as a whole.

Optimal quota in a mixed fairness model

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We will analyze indirect weigthed voting systems as the Council of the European Union and examine fair distributions of voting weights for the delegates, representing voting bodies of size $N_1, \ldots, N_m$, using a mixed fairness model. We will see that using a special quota together with mixed voting weights yields to the concordance of voting power and voting weight.

Considering the „one man, one vote" principle, the well-known result of L. Penrose states that the a priori Banzhaf voting power of a delegate has to be proportional to $\sqrt{N_i}$ for all $i = 1, \ldots, m$. Following on this theory, W. Słomczyński and K. Życzkowski showed in their *Jagiellonian Compromise*, that assigning the voting weights to $w_i = \sqrt{N_i} / \sum_{j=1}^{m} \sqrt{N_j}$ and using an optimal quota ensures the correspondence of voting weight and voting power.

On the other hand the „one state, one vote" principle suggests the same treating of each state. To fulfill this objective all voting weights have to be equal, which provides equal voting powers for each state independent from the chosen quota.

Using the ideas of A. Laruelle and M. Widgrén, we will consider a fairness model which combines these two fairness principles and assigns each delegate the voting weight $w_i(c) = c w_i + (1 - c) \frac{1}{m}$ for $c \in (0.5, 1]$ which is a convex combination of the voting weights above[1]. If we simultaneously apply the quota $q(c) = \frac{1}{2} \left(1 + \sqrt{\sum w_i(c)^2} \right)$, the voting power of each delegate coincide with the mixed voting weight $w_i(c)$.

This finding fits perfectly to the existing theory and provides an even more general result than the *Jagiellonian Compromise* which is a special case for $c = 1$.

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[1] The necessity to restrict the domain of c follows from the need that the quota independent principle does not dominate.

Victoria Soboleva

The Role of Ownership Concentration Measures in Exploring the Ownership - Performance Relationship

Victoria Soboleva

While interconnection of performance and ownership structure holds an important place in studies of corporate governance, empirical research in this field has delivered contradicting results. The paper aims to provide evidence on how choice of ownership concentration measure used in the analysis may affect the empirical findings on the ownership – performance relationship. For this purpose, three categories of ownership measures are considered, and their behaviour patterns in Tobin's Q regression analysis on UK top companies sample is assessed. The major findings are two-fold. First, all models demonstrate significant positive relationship regardless of the ownership measure or control set used. Herfindahl index and concentration ratios perform similarly across the three sets of control variables. Second, concentration ratios consistently produce higher results in terms of both predicting power of the model and their own significance in the models, despite the weakest theoretical underpinning among the three categories. Banzhaf index, representing the power indices category, does not seem to perform in accordance with Herfindahl and concentration ratios. Furthermore, though it is less frequent to take leading positions in highest quality models, it is able to contribute to the model more.