

Studies in Political Economy

Norman Schofield
Gonzalo Caballero *Editors*

State, Institutions and Democracy

Contributions of Political Economy

 Springer

Studies in Political Economy

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Norman Schofield, Washington University in Saint Louis,
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ISSN 2364-5903

Studies in Political Economy

ISBN 978-3-319-44581-6

DOI 10.1007/978-3-319-44582-3

ISSN 2364-5911 (electronic)

ISBN 978-3-319-44582-3 (eBook)

Library of Congress Control Number: 2016956209

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Printed on acid-free paper

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Introduction

The state, institutions, and democracy are a central part of the research agenda of contemporaneous political economy. Politics and economics are interested in understanding the state, institutions, and democracy from an interdisciplinary approach in social science that combines modeling, mathematics, and econometrics with solid theoretical foundations, structural factors, political and economic history, applied studies, and institutional analysis. We are trying to open the “black box” of the state, the institutions, and the democracy in a research program that incorporates diverse types of analysis. Theoretical and applied contributions have been included to improve our knowledge of the issues that have been selected.

This volume includes contributions from authors of papers that were presented at the IV Conference on Political Economy and Institutions, held in Baiona, Spain, December 2015, under the auspices of the University of Vigo and Washington University in St. Louis. Moreover, other chapters have been invited to be included in this volume too. The result is a volume with contributions by economists and political scientists from Europe, America, and Asia. Of course, each chapter in this book went through a review process before publication.

The volume is structured in four parts. Part I presents three chapters on bargaining, lobbying, and state capture. Part II presents six chapters that study elections and voting. Part III includes three chapters on state and public services. Part IV presents four cases of institutional change. Below, we briefly sketch the topics discussed in these chapters.

Part I: Bargaining, Lobbying and State Capture

1. “Bargaining with Outside Options,” Ken Binmore (University of Bristol) and Jon X. Eguia (Michigan State University)

This chapter comments on noncooperative and cooperate approaches to distributive (divide-the-cake) bargaining. We first review the challenges addressed by the seminal literature on two-person bargaining and three-person bargaining.

We then explore more recent developments on dynamic multiplayer bargaining over distributive policies, both over a single decision and over an infinite sequence of decisions with an endogenous outside option.

2. “Lobbying Mechanisms,” Martin Gregor (Charles University in Prague)

The Lobbying Disclosure Act 1995 has generated relatively clean data on the salaries of lobbyists and their staff, which has revolutionized the landscape of the analysis of political influence of special interests. This chapter reviews how the economic theory has reflected the recent shift of attention from campaign contributions to informational lobbying. The survey is an attempt to review the theoretical developments that are relevant to modeling of informational lobbying with explicit informational and game-theoretic microfoundations. The first part covers the early models of influence of special interests and discusses attempts to build explicit informational microfoundations for rent-seeking contests. Next, the single-tool (payments or information) and multiple-tool (payments and information) models of influence are covered. Then, the latter models are broadly divided into lobby-and-pay models and pay-and-lobby models. Specific yet important theoretical questions, namely, variants of information transmission, participation, and interaction of instruments of influence, are covered in detail .

3. “Financial Sector Regulation and the Revolving Door in US Commercial Banks,” Elise S. Brezis (Bar-Ilan University) and Joël Cariolle (FERDI)

This chapter develops an index of the distortions due to the revolving door—the Revolving Door Index. This index focuses on the process by which these distortions arise, by measuring the concentration of revolving door movements among private firms. We motivate this index, through a literature review and a small theoretical model, and illustrate it by an empirical application using data on the five biggest US commercial banks. Our data show that there is a concentration of revolving door movements which mainly benefit Goldman Sachs. This index may have policy implications for improving financial sector regulation.

Part II: Democracy, Participation and Electoral Politics

4. “The Rhetoric and the Reality of Austerity: Electoral Politics in Britain 2010–2015,” Paul Whiteley (University of Essex), Harold D. Clarke (University of Texas in Dallas), and Marianne Stewart (University of Texas in Dallas)

The Conservative victory in the 2015 general election in Britain was a surprise since the polls indicated that a hung Parliament was the most likely outcome with no party having an overall majority. The analysis in this paper confirms the proposition that electorates reward an incumbent party for a good economic performance and punish it for a bad one. Thus, public perceptions of the state of the economy played a key role in explaining the election victory. However, the story is not a straightforward one since we argue that the initial

economic policy adopted by George Osborne when he became Chancellor of the Exchequer in 2010 would have almost certainly lost the election for the Conservatives had he not changed course in the middle of the Parliament. The initial policy of austerity was adopted for ideological, theoretical, and electoral reasons but then was effectively abandoned midterm when it failed to stimulate an economic recovery. The paper shows how austerity was defined and pursued and how the government changed strategy in 2012 allowing a recovery from recession to take place. This in turn stimulated economic optimism among the voters which subsequently translated into an election victory in 2015.

5. “Valence and Ideological Proximity in the Rise of Nationalist Parties: Spanish General Elections, 2008 and 2011,” Elena Labzina, Joan Barceló, and Norman Schofield (Washington University in St. Louis)

This chapter investigates the rise of nationalist parties from the Spanish National Elections from 2008 to 2011 by adjusting the classic spatial voting framework. The traditional spatial analysis would suggest that stronger nationalistic preferences and nationalistic voters, party alignment might explain the increase in support for these parties. We argue that the rise of small and nationalist parties can hardly be explained by policy or nationalistic preferences given the spatial understanding of the politics.

Instead, exogenous valence is the main explanation for the electoral success of the political parties. This paper compares party valences and ideological, and demographic effects on the voting shares in the 2008 and 2011 Spanish National Elections to test our hypotheses. To properly capture the variation in the parties across regions, this paper develops and employs a refinement of the Bayesian adaptation for the varying choice logistic model proposed by Yamamoto (2011). Our findings suggest that the rise of the nationalist parties parallels the rise of the new political parties and not necessarily a shift in nationalistic preferences. Furthermore, we find that the main driver of the shifts in the electoral success across parties and regions is the changes in party-region exogenous valence. This paper provides important implications for the relevance of the non-policy considerations in the understanding of the changes in party support.

6. “Measuring Direct Democracy,” Nadia Fiorino (University of L’Aquila), Roberto Ricciuti (University of Verona and CESifo), and Fulvio Venturino (University of Cagliari)

This chapter provides an empirical analysis aimed at uncovering the economic, political, and social variables that make direct democracy institutions more or less likely. We provide a framework to investigate direct democracy institutions along the lines of constitutional design proposed by Aghion et al. (2004). We analyze a unique dataset where 87 countries are classified through an index of direct democracy (DDI). In applying a number of estimation techniques, we find that direct democracy is mainly correlated with income and education and does not significantly relate to institutional variables like presidential system and majoritarian voting rules.

7. “Political Participation in Rural India: A Village-Level Study,” Vani K. Borooah (University of Ulster) and Anirudh Tagat (Department of Economics, Monk Prayogshala, Mumbai)

This chapter uses village-level data on individual voters to study the factors which determine the probability of whether an individual votes. Is this probability greater for national compared to local elections? And is there evidence that people are more likely to vote today than they were in the past? Allied to these questions is another set of questions relating to the choice of candidates. Needless to say, voting in elections is just one facet of political participation. Another might be attending and participating in political meetings. This is particularly relevant in Indian villages since the Constitution (73rd Amendment) Act of 1993. This made it mandatory for all villages to have a village council (hereafter, Gram Sabha) consisting of all registered voters on the electoral roll of a village. The Gram Sabha was to be entrusted with the power of supervising the functioning of the elected village panchayat and to approve the panchayat’s development plan for the village and the associated budget. Consequently, in addition to voting, electors in villages had another form of political participation: they could attend Gram Sabha meetings and also participate in its discussions. This paper also analyzes the factors which determine attendance and participation in such meetings.

A worrisome feature of the results was the high proportion of married women reporting that they cast their vote according to their husbands’ instructions and further that this proportion was impervious to the education level of the women. The results would suggest that the reservation of village panchayat positions (including that of panchayat pradhan or village president) for women was a step in the right direction for the empowerment of women. In contrast, there were no intersocial group differences in participation in Gram Sabha meetings.

8. “Elections with International Relations Dominance,” Jan Klingelhöfer (RWTH Aachen University)

This chapter combines a model of international cooperation with a model of domestic politics with national elections between an incumbent prime minister and a challenger. International cooperation is modeled as a repeated prisoner’s dilemma game between two countries who are represented by their prime ministers. I compare three types of equilibria. In the country-specific grim trigger equilibrium, domestic politics does not affect international cooperation, and the standard results for the repeated prisoner’s dilemma game apply. The second equilibrium is based on McGillivray’s and Smith’s (2000) idea of agent-specific punishment. If a prime minister cares sufficiently about staying in office, the threat of replacing him in a primary if he does not cooperate internationally can change a politician’s incentives and make a larger maximum equilibrium level of cooperation possible. In the third equilibrium, I introduce the new idea of international dominance. In this type of equilibrium, domestic politics are dominated by considerations of international relations. The only function of the elections becomes either to punish or reward the prime minister

for international cooperation. Consequently, the maximum achievable level of international cooperation can be increased, but elections no longer lead to the victory of the candidate preferred by the representative voter.

9. “Electoral Rules and Proportionality in Spain: Estimating the Impact of Some Swedish Rules Through the 2011 Electoral Data,” José M. Pavía and Fernando Toboso (University of Valencia)

As many contributions have shown, the share of seats that political parties get in all elections is partly influenced by the electoral rules in place and particularly by the specific rules influencing how votes get converted into seats. In Spain, a traditional complaint has existed by both the leaders and supporters of some statewide political parties (such as IU or UPyD) who systematically have got a much lower share of seats than their share in total popular votes. This nonproportionality is also evident if we compare the results traditionally obtained by these two small statewide parties with those obtained by nationalist parties such as PVN (Basque Country) or the, now broken, coalition called CiU (Catalonia) that only presents candidates at one region-state and not in all regions-states of Spain. As the Swedish electoral system is known as a quite proportional system that could be implemented in Spain without reforming the Spanish Constitution, the purpose of this chapter consists of estimating how much the share of seats that resulted from the 2011 Spanish general elections would change if we apply some Swedish basic rules upon the raw electoral data, *ceteris paribus*. Of course, the behavior of voters and members of political parties also matters, and this behavior is not independent of the existing electoral rules, so the purpose of the paper is not to provide predictions.

Part III: State and Public Services

10. “Is There a Doctor in the House?”, Jani-Petri Laamanen, Mikko Poutanen, and Katri Sieberg (University of Tampere)

The option to purchase private health insurance in an otherwise public system seems to offer the best of all alternatives. The public system provides universal coverage, while the private option allows those with more resources to be able to purchase superior services. A closer look at the issue, however, reveals the potential for problems to arise in both the demand for the services and supply of the health-care professionals. We present a simple model of the incentives that the private sector can use to attract doctors in their choices between employment in the public and private sector. We further assess the resulting effects on doctor supply between the two sectors—in terms of numbers and in terms of quality. Our results indicate that without controls, the system can at best develop into a two-class system, in which more and/or better doctors select the private system, leaving inferior doctors in the public sector. As a real-world example of this problem, we appeal to the example of the Finnish health-care system, with its mixture of public and private services, and

show how the increase in private coverage has been associated with a decrease in resources for the public system. Our results indicate that this hybrid system is harmful to societal goals.

11. “What Makes People Nursing Home Residents: Individual Need or Municipalities’ Supply?” , Theis Theisen (University of Agder)

In a setting where admissions to nursing homes are strictly rationed, we consider which individuals become nursing home residents. Rationing decisions are taken at the level of municipalities. Using a national sample, we examine the impact on the rationing decision of individual characteristics and characteristics of the municipalities in which individuals live. High age, lack of self-care functionality, and lack of cognitive ability have a positive impact on whether an individual is in a nursing home. Men have a slightly lower incidence of living in a nursing home than women. Municipalities’ capacity in the nursing home sector has a strong positive impact on the probability of living in a nursing home.

12. “Civil Service and the Crisis: A comparative analysis of Iberian Countries (2008–2013),” Oscar Briones (University of Vigo), Joaquim Filipe Ferraz Esteves de Araújo (University of Minho), and Enrique J. Varela (University of Vigo)

The aim of this chapter is to assess the changing working conditions of public employees in order to shed some light on controversial issues concerning public employment models of central government in Spain and Portugal. The trends and reforms have been analyzed to assess the theoretical approaches underpinning policy reform implemented until the year 2013. In short, the aim of this study was to answer the question: Are reforms implemented due to the international financial crisis simply reforms and cuts in public employment, or do these changes entail a widespread far-reaching transformation in the current public employment models of the two Iberian states? Should the answer be the latter, this would signal the death of the civil servant as key actor of the human resource management model of the central government in Spain and Portugal.

Part IV: Cases of Institutional Change

13. “Congressional Negotiations with Costly Voting: Understanding the Reforms to PEMEX in 2006–2008,” Gilles Serra (CIDE)

The state-owned petroleum company in Mexico has played a fundamental role in the economy, but its productivity has been worryingly in decline. Several presidents of Mexico before Felipe Calderón tried to modernize Pemex, but they failed to pass any meaningful legal reform through the Congress. In this chapter I explain why Calderón was successful where other presidents were not. At the same time, I explain why Calderón’s successes were not as large as they could have been: indeed, the legal reforms to the Mexican oil industry in 2006–2008 were not as profound as they were expected to be. I claim

this was due to the costs that political conditions imposed on congressional negotiations. Irrespective of their preferences, legislators faced punishment by radical political leaders and passionate voters if they supported Calderón's initiatives. At the same time, some pivotal negotiators in the Congress were able to extract significant side payments for their support of government initiatives. To clarify these complex dynamics, I use the traditional concepts from spatial voting theory: I identify the main issues regarding Pemex, the main political agents in charge of reform, and the positions of these agents on those issues. I also propose a modeling innovation to the traditional spatial theory of voting, which consists on considering the punishment that legislators may incur from supporting a bill that they like. With these theoretical tools, I am able to explain the puzzling coalitions that were formed for the 2006 budget law, the 2007 fiscal reform, and the 2008 energy reform. I suggest that these same theoretical tools could be used to understand congressional negotiations in other contexts.

14. "Institutional Change, Specific Investments and Photovoltaic Power Plants: The Empirical Effects of the Energy Policy of Solar Farms in Spain," Marcos Álvarez-Díaz, Raquel Fernández-González, and Gonzalo Caballero (University of Vigo)

The Spanish government introduced a bonus policy for the installation and exploitation of photovoltaic solar energy before the Great Recession, and it implied the increase of the number of solar farms in Spain. Nevertheless, the government did not adequately take into account the cost of the bonuses for the public treasury and neither did it contemplate the changing macroeconomic scenario derived from the Great Recession since 2008. In fact, the government rectified later and proceeded toward cancelation and elimination of the bonus policy in the photovoltaic sector. This chapter analyzes the process of institutional change and of bonus policies in the Spanish solar energy sector from the point of view of new institutional economics, by performing an empirical analysis on the effects of an energy policy that first announced and established public bonuses for solar parks but which later eliminated them unilaterally. These changes in energy policy had a significant impact on return for investors who had made irreversible investments in solar parks. The empirical analysis concludes the change in the trends of the Spanish solar farm sector in September 2008. The institutional analysis includes the study of the process of institutional change and the legal actions, appeals, and lawsuits that the investors presented at the third-party enforcement mechanisms.

15. "The Economic Effects of the Implementation of the Greek Adjustment Plan in the Great Recession," Inmaculada Carrasco (Castilla-La Mancha University), Carmen Córcoles (Castilla-La Mancha University), and John McCombie (Cambridge University)

In a situation of deep economic crisis such as the present one confronting some European countries, it is necessary to take measures to reduce the dangerous disequilibria that they face. The orthodoxy dictates that it is imperative to undertake strong fiscal consolidation to ensure a recovery in economic activity. The existing debate has tended to focus on the global analysis of such policies.

As a contribution to this literature, in this chapter we provide a multisector and multiregional study of the effects of the fiscal adjustment implemented in Greece in 2012 using an input–output methodology. It allows us to trace the consequences of this fiscal policy for the different Greek economic sectors, as well as for the EU and the rest of the world. This is undertaken using the WIOD (World Input–Output Database). This study concludes that, far from leading to a revival in the Greek economy, the fiscal adjustment has led to a contraction in the health and public administration sectors, as well as the industrial sectors with the last leading to a greater downturn in the economy.

16. “E-procurement and Innovation in the Portuguese Municipalities: When Change is Mandatory,” Luís Soares (Câmara Municipal de Castro Verde) and Adão Carvalho (Universidade de Evora)

Changing the traditional pattern of public procurement for an electronic paradigm is a radical innovation involving major organizational changes, the breaking up of traditional processes and practices, and the obsolescence of knowledge and skills. Going beyond the European Commission’s recommendations, in 2009 Portugal pioneered in making e-procurement mandatory in the pre-award phase, in a European context of multiple technical standards and lack of interoperability of electronic platforms across the EU countries. Six years later, when the creation of a European e-procurement single market is a EU mission and a major legislative amendment is under way in Portugal, this study looks at the relationship between e-procurement and innovation in the Portuguese municipalities aiming to understand the extent into which the adoption of e-procurement embraced a real organizational change or, on the other hand, if it just represented a mere adaptation of the usual procurement practices. The study draws on data from an electronic survey to all municipalities in mainland Portugal, and the analysis is mainly descriptive and exploratory. The paradigm shift in public procurement involves major organizational changes, but overall, the results suggest that most municipalities do not have a clear understanding of the innovative scope (depth and diversity) implied by e-procurement. E-procurement shows advantages over the paper-based model, but an unbalanced perception of the innovation dimensions has influenced the implementation of e-procurement and the degree of organizational change.

Part I
Bargaining, Lobbying and State Capture

Bargaining with Outside Options

Ken Binmore and Jon X. Eguia

1 Introduction

We begin by reviewing the theory of two-person bargaining and three-person bargaining over a unit of wealth in the presence of outside options. We then explore the implications and developments in the literature for bargaining games with more than three players, and in particular, for legislative bargaining games in a democratic assembly with many members who decide by majority rule how to divide a unit of wealth, or an infinite sequence of units of wealth.

The Nash bargaining solution applies to bargaining problems between two rational players who have no secrets from each other (Nash 1950). Such solution concepts—characterized by a set of axioms—are classified as being part of cooperative game theory. Cooperative game theory is often mistakenly regarded as a rival to noncooperative theory but Nash saw cooperative and noncooperative game theory as complementary approaches in which the strengths of one approach can buttress the weaknesses of the other.

Cooperative game theory presupposes a preplay negotiation period during which the players come to a binding agreement on how a game is to be played. However, all this preplay activity is packed away in a black box during a cooperative analysis. The strength of the approach is that it is often possible (as in the case of the Nash bargaining solution) to obtain a simple characterization of *what* deal rational players will reach. Its weakness is that it fails to explain *why* rational players will honor the axioms that support one solution concept rather than the axioms

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that support an alternative solution concept (like the Kalai-Smorodinsky (1975) bargaining solution).

1.1 *The Nash Program*

The Nash program invites us to open the black boxes of cooperative game theory to see whether the mechanism inside really does work in the way the axioms characterizing a cooperative solution concept assume. Nash observed that the details of the negotiation process we will find inside such a black box determine a noncooperative game, in which the moves are everything the players may say or do while bargaining. If we model any bargaining that precedes a game \mathcal{G} in this way, the result is an enlarged game \mathcal{N} . A strategy for this negotiation game first tells a player how to conduct the preplay negotiations, and then how to play \mathcal{G} depending on the outcome of the negotiations. Negotiation games must be studied *without* presupposing preplay bargaining, all preplay activity having already been built into their rules. Analyzing them is therefore a task for noncooperative game theory. This means looking for their Nash equilibria, in the hope that the equilibrium selection problem won't prove too difficult when there is more than one equilibrium.

When a negotiation game \mathcal{N} can be solved successfully, we have a way of checking up on what a cooperative solution concept tells us about the rational outcome of \mathcal{G} . If a cooperative solution concept says that the result of a rational agreement on how to play \mathcal{G} will be s , then s should also result from solving \mathcal{N} as a noncooperative game. If it does not, then we have a mismatch between our cooperative axioms and the economic environment in which they are being applied.

Two mistakes are commonplace. The first is to conclude that we need not bother with cooperative theory at all. One should instead always undertake the impossible task of modeling all bargaining using noncooperative models. This is impossible because a negotiation game that was sufficiently general to capture each twist and turn that a real-life negotiation might conceivably take would be complicated beyond all imagining. One can only analyze simplified negotiation games—as in Nash (1951) or Rubinstein (1982)—and hope that one is right in thinking that the simplified game captures all the strategic factors that really matter. In practice, Rubinstein's model is usually substituted for the actual negotiation game, but this is a pointless activity since we already know that the Rubinstein game implements the Nash bargaining solution (Binmore 2007). This observation leads to the second mistake, which is to proceed as though we need not bother with noncooperative theory at all. The next section explains why this attitude—which is orthodox in the matching-and-bargaining literature—sometimes leads to the parameters that characterize a bargaining problem being written wrongly into the Nash bargaining solution used to predict its outcome.

2 Outside Options

Nash (1950) models a two-person bargaining problem as a feasible set of payoff¹ pairs on which the players might agree, and a *status quo* payoff pair that represents what each player will get in the event of a disagreement. Sometimes this model is adequate and sometimes not. It is not adequate, for example, when information is incomplete.² Nor is it adequate when time matters and the players discount time at different rates.³ Nor when disagreement can arise in more than one way. We focus here on a simple version of the last case.

Suppose that two disagreement points can be distinguished in a bargaining problem: a deadlock point and a breakdown point. The deadlock point is the payoff pair that would result if the players bargained forever without breaking off the negotiations or reaching an agreement. The breakdown point is the payoff pair that would result if one player were to abandon the negotiations irrevocably with the result that both players take up their best outside option.

The breakdown point and the deadlock point may be the same, but when they are not it is commonplace in studying wage bargaining to identify the status quo in the Nash bargaining solution with the breakdown point. When is this sound modeling practice? Two noncooperative models can be used to examine this question.

Nash's Demand Game In this game, two players make simultaneous take-it-or-leave-it demands (Nash 1951). If the demands are jointly infeasible, all bargaining is over and cannot be resumed. The players will then take up their best outside options (that may include continuing to cooperate with their bargaining partner on the same basis as before they failed to agree on a new contract). Identifying Nash's status quo with the breakdown point then makes sense.

Rubinstein's Alternating-Offers Game But who believes people who say they are making their last and final offer? What prevents your bargaining partner from refusing your offer, and then making a counter-offer before you have the chance to commit to an outside option? This natural feature can be built into Rubinstein's (1982) alternating-offers bargaining model without difficulty (Binmore et al. 1982). If the players discount time at equal rates and the interval between successive offers is sufficiently small, the subgame-perfect equilibrium outcome approximates the Nash bargaining solution for the case when all deals that pay players less than their

¹A payoff in game theory is a Von Neumann and Morgenstern utility.

²If it is common knowledge that the valuations of a risk-neutral buyer and seller of a house are independent and equally likely to be anything between \$2m and \$3m, then the result of optimal bargaining is seriously inefficient. Even when the bargaining process is chosen to maximize the expected surplus that rational bargainers can achieve, the house is sold only when it is worth \$0.25m more to the buyer than the seller (Myerson 1991).

³The Nash bargaining solution (which treats the bargainers symmetrically) then needs to be replaced by an asymmetric version (Binmore 2007).

best outside option have been removed from the set of feasible agreements.⁴ The status quo in this use of the Nash bargaining solution is placed at the deadlock point, which corresponds to the payoffs the players would receive if all offers were always refused and no outside option were ever taken up.

The alternating-offers game so obviously fits wage bargaining better than the demand game that it remains a wonder that the matching-and-bargaining literature should hold so firmly to the practice of locating the status quo in the Nash bargaining solution at the breakdown point rather than the deadlock point.

3 Three-Player Bargaining

What happens when the conclusion of the preceding section on two-person bargaining with outside options is applied to bargaining among more than two players?

A new problem then arises because deals may now be reached that do not include all the bargainers. We therefore have to determine not only how much each signatory of an agreed contract receives, but also who is excluded from the winning coalition (or coalitions). The latter problem is endemic in political science. Many coalitions might form, but which coalition will actually form as the result of rational bargaining? Unfortunately, noncooperative bargaining models adapted to this problem commonly have multiple equilibria, and so a determinate answer is available only in special cases.

The three-player/three-cake problem studied in Binmore (1986) serves to illustrate the latter issue. Only one of three feasible cakes are available for division at the end of the bargaining session. Each cake is controlled by a different pair of players, as illustrated in Fig. 1 (where the cake Y_{ij} is controlled by players i and j). The aim of player i in the bargaining game is to reach an agreement with another player j which determines that cake Y_{ij} is to be divided and how much each player will then receive. The outvoted third player k then gets nothing. We simplify by placing the deadlock point at the origin. Even though we assume that the players have no external outside options, the breakdown situation is more complicated because the outside option for i when bargaining with j is the payoff that i would receive by abandoning j and making a deal with k .

⁴See Binmore (2007, Chap. 16) for examples. When the players have differing discount rates, an asymmetric version of the Nash bargaining solution applies. There are experimental criticisms of the subgame-perfect equilibrium concept, but the result holds with the much weaker idea of a security equilibrium (Binmore and Herrero 1988). In any case, direct experimentation supports the bargaining conclusion (Binmore et al. 1989).

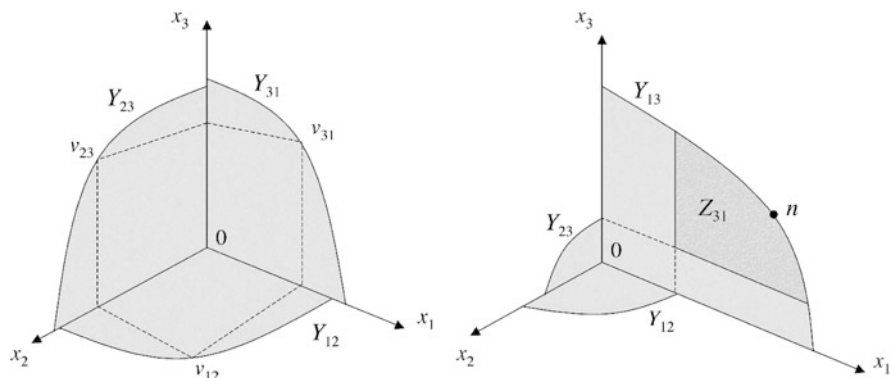


Fig. 1 Three-player/three-cake problem. The deadlock point is placed at the origin, and individual players have no external outside options. However, outside options arise endogenously because when two players make a deal, they always have the alternative of proposing a deal to the third player who will otherwise be left with nothing. The feasible set Y_{ij} is what is available to the coalition $\{ij\}$. The *left diagram* shows a case in which a Von Neumann and Morgenstern triple exists. When such a triple $\{v_{12}, v_{23}, v_{31}\}$ exists, the final outcome is one of its three elements. The *right diagram* shows a case in which no Von Neumann and Morgenstern triple exists. Only one coalition can then form. In the figure, this coalition is $\{31\}$, and the final outcome is the Nash bargaining solution n when the feasible set is Z_{31} and the status quo is 0

3.1 Cooperative Approach

Two distinct cases are identified in Fig. 1.

Von Neumann and Morgenstern Triple The left diagram of Fig. 1 illustrates the case in which a Von Neumann and Morgenstern triple (v_{12}, v_{23}, v_{31}) exists.⁵ Suppose that 1 and 2 are bargaining in this case with a view to excluding 3. With the second bargaining model of Sect. 3, they will then agree on the Nash bargaining solution with status quo at the deadlock point 0 for the set Y_{12} with all points that pay 1 or 2 less than their outside options removed. When these outside options are what they would get from v_{23} and v_{31} , this set Z_{12} consists only of the single point v_{12} , which is therefore the deal on which 1 and 2 will agree should they get together to bargain.

An identical argument shows that 2 and 3 will agree on v_{23} if they get together to bargain. Similarly, 3 and 1 will agree on v_{31} . But which of the three two-player coalitions will actually form is left unspecified. In practice, this question

⁵The notion generalizes an idea of Von Neumann and Morgenstern (1944) for zero-sum games, nowadays called a symmetric stable set (Binmore 2007, Sect. 18.4). In such a triple, v_{12} is an efficient point of Y_{12} that assigns the same to 1 and 2 as they would get in v_{31} and v_{23} respectively (and nothing to 3). Similarly for v_{12} and v_{31} .

is determined by historical or accidental factors that may easily vary over time and are not included in the model.⁶

Two Buyers and One Seller The right diagram of Fig. 1 illustrates a case with no Von Neumann and Morgenstern triple. The theory then predicts that the coalition $\{3, 1\}$ will form. When 3 and 1 bargain, their outside options will be the most that 2 can offer each of them. They will therefore agree on the Nash bargaining solution with status quo at the deadlock point 0 for the set Z_{31} (which is Y_{31} with points that pay less than a player's best outside option removed). In Fig. 1, the outcome is *not* what would be obtained by placing the status quo at the point at which both players receive their best outside options. It is exactly the same as it would be if the players had no outside options at all.

A particularly interesting case arises when 1 and 2 are rival buyers, and 3 is the only available seller of a good. The set Y_{12} then contains only the origin. This will make no difference to the preceding result unless Y_{23} in Fig. 1 is enlarged so that 2 can offer 3 more than 3 gets at n . Applying the Nash bargaining solution with status quo at 0 to Z_{31} then results in 3 getting no more than his outside option and 1 getting the rest of what is available. That is to say, 3 sells to 1 at the highest price that 2 is willing to pay, which is the perfectly competitive outcome. The argument that leads to this conclusion is a retelling of the story usually offered when studying Bertrand competition.

3.2 *Noncooperative Approach*

The results of the previous section are defended in Binmore (1986) using a noncooperative model. Section 3 draws attention to the need to ask whether Nash's Demand Game or Rubinstein's Alternating-Offers Game (or some other game) fits a particular application best. With more than two players, it is necessary to make a further distinction between telephone bargaining models and market bargaining models. The literature commonly appeals to the Telephone Game [as in Chatterjee et al. (1992)] but the Market Game fits many applications better.

Telephone Bargaining Game This game is a direct extension of Rubinstein's Alternating-Offers Game to the three-player/three-cake problem. A player phones one of the other players and they exchange offers until agreement is reached, or else one of the players hangs up (exercises his outside option) and phones the third player, whereupon the situation repeats itself. This model fits applications like the wage-bargaining problem studied by Shaked and Sutton (1984) in which the employer has to bargain with employees one-by-one. He cannot then bring his full bargaining power to bear because an employee will respond to his threat to

⁶Hence the frequent switching of alliances sometimes observed when studying balance-of-power issues?