



MPIfG Discussion Paper 05/9

**Ending Cooperation:  
A Formal Model of Organizational Change  
in German Pharmaceutical Interest Representation**

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Max-Planck-Institut für Gesellschaftsforschung Köln  
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## Abstract

This paper uses a game theoretic model to investigate the 1993–94 split-up of the main German pharmaceutical association into an association for multinational, research-based companies and an association representing small and medium-sized firms. In order to explain the breakdown of cooperation among group members, the paper employs a model that combines collective action and bargaining. The model suggests that changing issues can play an important role in organizational change. In the case of the German pharmaceutical industry, the key issue changed from pharmaceutical registration to cost control. With respect to the former issue, the different factions in the pharmaceutical industry had complementary interests and were able to find a compromise position. The latter issue led to a conflict over the redistribution of scarce resources between the factions; formally, this meant that all issue dimensions were equally important to all factions. As a result, it became impossible to realize policy gains through a political compromise.

## Zusammenfassung

Die folgende Studie untersucht den Austritt forschender Arzneimittelhersteller aus dem Bundesverband der Pharmazeutischen Industrie (BPI) zum Jahreswechsel 1993/1994 und die darauf folgende Gründung des Verbands forschender Arzneimittelhersteller (VFA). Unter Zuhilfenahme eines spieltheoretischen Modells, das Verhandlungstheorie mit der Theorie kollektiven Handelns verbindet, wird hier argumentiert, dass Änderungen im Issuekontext organisatorischen Wandel verursachen können. Im Falle der deutschen Pharmainteressen wurde die Zulassung von Arzneimitteln als dominantes Issue von der Frage der Kostenkontrolle abgelöst. Im Falle der Arzneimittelzulassung konnten die verschiedenen Herstellergruppen Kompromisspositionen erreichen, während im Falle der Kostenkontrolle zu einem schwer lösbaren Verteilungskonflikt zwischen innovativen, OTC- und Nachahmerprodukt-Herstellern führte, der auf die Gründung getrennter Verbände hinauslief.

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## Introduction

In 1993, more than 100 German and international pharmaceutical companies left the German Federal Association of the Pharmaceutical Industry (*Bundesverband der Pharmazeutischen Industrie*, BPI), the association that had represented their interests since 1951. The result was the foundation of two new pharmaceutical associations, one for the generics industry, and another for the innovative, multinational companies. The latter group, the Association for Research-Based Pharmaceutical Companies (*Verband Forschender Arzneimittelhersteller*, VFA), quickly replaced the BPI as the most influential German pharmaceutical association. Its members comprise 60% of the prescription drug market, and it accordingly plays an important role in national and international fora, such as EFPIA (the European Federation of Pharmaceutical Industries and Associations) and recently in the German Roundtable in the Health Care Sector (Frankfurter Allgemeine Zeitung 1993b,d,f).

Here is a puzzle: Why did an association that had been successful and powerful for more than 40 years suddenly break apart? The literature on interest group formation and maintenance does not provide conclusive answers. The pluralist tradition (McFarland 1991; Truman 1951; Vogel 1989) emphasizes the role of social conflict and the strength of the “enemies” of business: If industry interests are threatened, they will organize. This is not the case here; the crisis occurred in a period when the pharmaceutical industry was on the defensive. Despite the external threat, the industry did not rally around its major association but split up into different factions. Rational Choice theorists in the Olsonian tradition argue that interest group formation and maintenance is the result of a set of selective incentives (Moe 1980; Olson 1965; Wilson 1973). This would suggest that groups fail because members are no longer interested in their services. This does not fit the BPI’s case. On the one hand, the split-up in the pharmaceutical industry was accompanied by furious intra-group conflicts – members seemed to be very interested indeed. On the other hand, the BPI retained a large number of members, which suggests that at least some selective incentives might still have worked.

Building on the Rational Choice approach to interest group formation and maintenance, I propose a formal model that will help us to understand cases like the one encountered in the German pharmaceutical industry. Similar to Olson, I assume that interest groups have to overcome collective action problems, which they can do with the provision of selective incentives. However, in contrast to other collective action models, I assume that group members do not agree on which collective good they should pursue. The collective good consists in the pursuit of a political position, and group members differ

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in their evaluation of different policies. Therefore, the group has to negotiate a common position, in addition to dealing with collective action problems. I will show that under certain conditions, group organizers can design institutional mechanisms that use policy conflict to overcome collective action problems. If conditions change, groups that relied on such institutional mechanisms to ensure cooperation might fail.

Why should we care? First, if we want to know who influences policy, we need to know who is well organized, since well-organized interests can communicate their message more clearly and influence political choices more easily. Second, it has been observed that the influence of particular social actors changes over time (McFarland 1991; Vogel 1989). In order to understand the reasons for these fluctuations in influence, we have to find the factors that might change. In this paper, I propose that the political agenda is one such factor that influences the ability of groups to provide incentives for different interests to cooperate. Third, the case under study is substantively important. The BPI represented one of the important German industries of the twentieth century. Its crisis has alarmed other groups, which are afraid of similar things happening to them.<sup>1</sup> If we want to understand the process of German pharmaceuticals policy in the second half of the 1990s, we have to investigate the factionalization of pharmaceutical interest representation.

The section following this introduction provides some substantive information on the functioning of the BPI before the 1994 split-up, on the main issues that have been important for the association since the 1960s, and on the attempts made in 1993 to reorganize and save the association. This will serve as a background for the subsequent theoretical discussion and the formulation of a game theoretic model. The conclusions drawn from the model will then be used to analyze the empirical case; conversely, the empirical case provides us with a first informal assessment of the usefulness of the model. The formal discussion of the model, including all proofs, can be found in the appendix.

## The BPI and pharmaceuticals policy before 1994

The conflict between research-oriented multinational firms and pharmaceutical *SMEs* that led to the split-up of the BPI focused on organizational issues. Therefore, it will be useful to survey the BPI's formal structure.<sup>2</sup>

Founded in 1951, the BPI is the oldest post-war pharmaceutical association in Germany.<sup>3</sup> In 1984, it represented 506 member companies, which accounted for 95% of phar-

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1 Personal interview with a German interest association representative, April 17, 2002.

2 If not otherwise noted, the following is based on Groser (1985).

3 The more specialized *Bundesfachverband der Heilmittelindustrie* (federal sector association of the proprietary medicines industry, BHI), which originally represented only the over-the-counter sector, was founded a few years later. In the early 1980s, it was renamed *Bundesfachverband* (now *Bundesverband*) *der Arzneimittel-Hersteller*, BAH.

maceutical production in Germany. Since its membership fees constitute a proportion of income (0.12% of turnover, of which 0.02 percentage points are used as membership fees for the German chemical association), the BPI had comparatively large resources and a comparatively large staff.

Although membership fees are weighted by firm size, the BPI's decision making processes are rather egalitarian. The association's main governing body, the general assembly, consists of 80 to 120 delegates selected by the BPI's regional associations. The number of delegates selected within a region depends on its relative membership size, which means that the principle "one firm – one vote" is the basis of the internal decision making process. The general assembly selects the executive committee and some of the board members.

The hierarchical structure of the BPI is based on region, not on sub-sectoral characteristics. Before the German re-unification, the association was divided into 10 regional associations, whose boundaries corresponded to the regional divisions of the German chemical industry association (VCI), and roughly to the German *Länder*. (After re-unification, the regional structure was consolidated into 7 regional associations.) The regional associations select some of the members of the association board. In addition to the regional associations, the BPI contains several policy-oriented and sub-sectoral committees and sections that deal with specific issues such as over-the-counter drugs, phytopharmaceuticals, or veterinary medicine. These fora offer opportunities for direct firm participation.

Similar to other large German business associations, the BPI has not merely been a lobbying group but has also engaged in self-regulatory activities, for example in the areas of advertising<sup>4</sup> and information directed at physicians. In 1981, the BPI established a *codex* for its members that contained rules and guidelines for advertisement.<sup>5</sup>

Violation of these rules was punishable by exclusion from the association. This constituted a rather powerful selective incentive, since association membership was the precondition for inclusion in the so-called "Red List" of medicines. This list of all medicines produced by BPI members, along with their indications, was sent to practicing physicians every year. The fact that the Red List constituted a powerful incentive to join the BPI is documented by a court case reported by Groser. This case involved a former BPI member who was excluded from the association due to the violation of some of its advertising regulations.<sup>6</sup> The company sued to have its products included in the Red List, but lost. Subsequently, it decided to adhere to the advertising rules and rejoin the BPI (Groser 1985: 49).

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4 In Germany, the advertisement of pharmaceutical products to the general public is strictly limited; public advertisement of prescription medicines, for example, is prohibited.

5 The codex also regulated other areas, such as producer participation in procedures to monitor the post-marketing performance of medicines.

6 This case took place before the formulation of the codex, and referred to restrictions regarding the size of medicine samples that could be given to physicians.

Taken at face value, the conflict of 1993 was about demands by a group of companies that were organized in the so-called Medical-Pharmaceutical Research Society (*Medizinisch Pharmazeutische Studiengesellschaft*, MPS) to change the BPI's organizational structure.<sup>7</sup> The main point of criticism was the power of the regional associations, which, it was argued, led to a cumbersome decision making process. In addition, large research-oriented firms complained that their influence in the BPI was smaller than their financial contribution (Frankfurter Allgemeine Zeitung 1993c). Even after the VFA had been founded by the members of the MPS (and other large firms), the BPI secretariat tried to transform its association into an umbrella group that would be able to integrate the VFA as a corporate member. This attempt failed to obtain the required two-thirds majority of the December 1993 BPI assembly (Frankfurter Allgemeine Zeitung 1993a,b).

The difficulty with such a purely organizational explanation of the 1993 conflict and its consequences is that the BPI was able to work very effectively for more than four decades before the break-up. Also, for a long time, the industry had been divided into large companies involved in research-oriented production for an international market and *SMEs* focusing mostly on generics and other less research intensive medicines for a domestic market (including phytopharmaceuticals and homeopathic medicines, which are relatively popular in Germany). It is not obvious why these relatively stable factors led to the radical change in the early 1990s.

In order to understand the change, we need to look at the changing issues that dominated pharmaceuticals policy. In the late 1960s and early 1970s, the main issue was the registration of pharmaceuticals, and the criteria used for this process. Beginning in 1961, pharmaceuticals had to be registered with the Federal Bureau of Health (*Bundesgesundheitsamt*), and the sale of health-threatening medicines was prohibited. However, it was not necessary for producers to prove the safety and effectiveness of their medicines. In 1964, following the thalidomide affair, documentation of safety and effectiveness were required, but the regulations were still not as strict as in other countries, such as the United States (Murswieck 1983: 284–287). As international trade in pharmaceuticals increased, there was also increasing pressure to adjust registration requirements according to WHO guidelines. This pressure came, in part, from large, export-oriented companies, whereas smaller companies were reluctant to agree to stricter regulatory requirements (Westphal 1982: 213ff.). In 1976, a new pharmaceuticals law introduced stricter registration requirements that – at least partly – followed the American model<sup>8</sup> (Murswieck 1983: 288–289).

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7 The main activities of the MPS focused on public relations and support of basic research rather than on political lobbying (Groser 1985).

8 Exceptions are in the areas of phytopharmaceuticals, homeopathic, and other “traditional” medicines.

Since the late 1970s, the so-called health care “cost explosion” has dominated health care policy, particularly pharmaceuticals policy. The 1977 Health Insurance Cost Containment Act reduced the reimbursement of medicines for certain indications (common cold etc.), increased prescription fees for patients, and introduced limits on the overall pharmaceutical expenses of sickness funds (Webber 1988). In 1989, the first of a series of “health reform” laws passed by the center-right government introduced a “negative list” of medicines that were excluded from reimbursement by statutory sickness funds. In 1991, this list was extended to include not only medicines for indications that were routine and not dangerous, but also medicines with low economic value or low therapeutic effectiveness. Furthermore, the 1989 law introduced a system of so-called “fixed prices” for medicines using the same therapeutic substances (this system was later to be extended to medicines with *similar* therapeutic substances). Sickness funds would reimburse only the fixed prices, and patients had to pay the difference between the fixed and the actual price (Schneider et al. 1993).<sup>9</sup>

The price control measures of 1977 and 1989 primarily affected producers of non-innovative medicines. These medicines were either subject to price controls, or they had to be paid for by patients, which reduced the eagerness of doctors to prescribe them. In contrast, the 1992 Health Care Structural Reform Act affected the large, innovative companies. It introduced a budget for the pharmaceutical expenses of the statutory sickness funds, increased patient co-payments for medicines, and imposed a five-percent price reduction on medicines not subject to fixed prices (Blanke/Perschke-Hartmann 1994; Kirkman-Liff 1999; Perschke-Hartmann 1993). Since physician compensation would be reduced if budgets were exceeded, physicians were careful when prescribing particularly expensive medicines – a practice that particularly affected the innovative, patented medicines. Furthermore, innovative medicines tended not to be subject to fixed prices, and were therefore subject to the mandatory price reduction.

It is interesting to see that the three major issues in pharmaceuticals regulation since the 1960s provoked a division of interests between large, innovative, multinational companies and small and medium-sized companies targeting the German domestic market. The question is: Why did it take until the 1990s for these conflicts to lead to the formation of separate associations for the two factions of pharmaceutical producers?

The following theoretical considerations attempt to provide an answer by investigating the interaction between the structural characteristics of the BPI and the nature of the salient issues.

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9 The fixed prices would be determined by the associations of physicians and sickness funds (Webber 1989).

## A theory of coalition building in interest groups

Beginning with Olson (1965), the existing literature has focused on interest group creation and maintenance rather than group failure and change.<sup>10</sup> The reason for this is well known: The pluralists had assumed that interest group formation was basically automatic, and Olson argued that there was a problem – that is, a collective action problem. Failure was considered the default; group creation had to be explained. The question of group failure and change was addressed, if at all, only as a minor topic, or implicitly. Wilson (1973: 31), for example, mentions a number of factors that constitute threats to organizational maintenance. However, the issue has not received systematic attention.

The lack of attention to interest group failure is not such a terrible problem, since explanations of group success also imply explanations of failure. I will build here on these implicit explanations of failure, and for that purpose I will summarize the main arguments that we can find in the literature. However, I will maintain that these arguments either do not help us understand the case being investigated in this paper, or are not sufficiently formalized to be applied to specific cases. This paper intends to remedy that situation.

Olson's formal model suggests only one condition for the provision of collective goods: The existence of a privileged group – that is, the presence of one group member whose benefits from the provision of the collective good are so high that she prefers to provide the good on her own. Since it is clear, empirically, that there are circumstances under which non-privileged groups (Olson calls them "latent" groups) organize, Olson provides additional arguments to explain group formation. The most important of those arguments relate to the size of the groups and the provision of selective incentives.

The theory of selective incentives is a straightforward extension of Olson's model: Contributions to the provision of a collective good are associated with the receipt of a private good. Equivalently, the refusal to contribute to the collective good subjects the defector to punishment. As a result, the collective good is the by-product of the provision of private goods. In contrast, the argument that small groups are more likely to overcome collective action problems is not clearly linked to Olson's formal model. His argument – smaller groups have lower organizational and monitoring costs, and they can use social incentives – does not directly follow from his main argument. Later studies show that the small-group argument is not necessarily compatible with Olson's basic model (Sandler 1992).

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10 In fact, the question of internal interest group politics has been somewhat out of fashion. Research has focused more on the political influence of competing lobbyists (Andersen/1995; Austen-Smith 1993; Austen-Smith/Wright 1992; Wright 1996) or on analyses of systems of interest representation (Falkner 2001; Gray/Lowery 1988; McFarland 1991; Streeck/Schmitter 1991) and not on organizational foundation or maintenance. This means that the question of group failure has been even further neglected.

Authors such as Wilson (1973) and Moe (1980) extend the concept of selective incentives, identifying various types of them. Wilson distinguishes between material, specific and collective solidary, and purposive incentives (32–47). Moe emphasizes non-economic incentives: In addition to purposive and solidary incentives, he mentions norms, peer pressure, and the impact of authority.

The emphasis on selective incentives, however, prompted the question of whether the argument did not replace one collective action problem with another: If selective incentives were provided to induce cooperation, there were positive externalities involved, and the selective incentives therefore also had characteristics of collective goods. The solution was found in organization theory, particularly in the concept of the entrepreneur. Political entrepreneurs were identified as those actors who organize contributions to collective goods and supply selective incentives (Frohlich et al. 1971; Moe 1980; Wilson 1973). The behavior of entrepreneurs, in turn, was explained by the existence of opportunities to profit from the organization of groups. With respect to interest groups, entrepreneurs could make a living as association secretaries.

What are the implications that we can draw from the Olson-Wilson-Moe line of argument for an explanation of interest group failure? First, Olson's size argument would suggest that group maintenance becomes more difficult as the number of potential group members increases. This argument has to be interpreted subtly, however, since Olson's concept of group size is somewhat unusual: The size of a group is the minimum number of members who can gain from cooperation.<sup>11</sup> Therefore, one hypothesis might be (roughly): As those members of the group who value the collective good most lose interest in the good, it is more likely that the group will dissolve. With respect to interest groups, this means that groups decline if the political process and its outcomes diminish in importance for their members.

Second, the selective-incentives argument implies that interest groups fail if the selective incentives they provide lose value or cannot be provided anymore. This argument is more complex and difficult than it seems to be at first glance. We should expect entrepreneurs to supply other selective incentives if one should fail. However, it is possible that the supply of "new" selective incentives might be too costly for the entrepreneur to pursue. In addition, it might not even be possible to produce new selective incentives that can replace the ones that have lost their value. For the researcher, it is very difficult to determine which possible selective incentives are available in a particular case. In fact, the definition of the set of available selective incentives is part of the game of interest group formation; the entrepreneur's imagination and inventiveness are important factors in this regard. Therefore, it is very difficult to investigate empirically whether it was the lack – or the cost – of selective incentives that led to group failure.

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11 For a smaller number of members, it would not be worth cooperating because their costs of cooperation exceed the aggregate gain from the collective group. The smallest group is a privileged group; this implies that there is one member who prefers to provide the collective good on her own.

Third, the role of the entrepreneur suggests potential explanations for interest group failure. If the supply of able secretaries in a particular sector declines, some groups might lack effective organizers as staff members retire or join other organizations. The reason for such a decline in competent entrepreneurs could be the relative decline of the profitability of group organization as compared to other entrepreneurial projects. Again, this might be related to lack of interest in the group, for example as politics becomes less important for an industrial sector. Empirically, however, this argument is not particularly credible: In particular, the existence of large consultancies that offer commercial organizational support indicates that interest groups are commercially worthwhile, from an entrepreneur's perspective. Furthermore, their existence suggests that entrepreneurial resources are available.

There are two further strands of argument about the formation of interest groups that should be mentioned here. First, empirically oriented studies of interest groups have noted the importance of the interaction between a group and its environment (Moe 1980; Schmitter/Streeck 1999). With respect to political interest groups, the role of the government can be very important. In the European Union context, for example, the European Commission has been important as a sponsor of some groups (for example, BEUC). The role of business associations in regulatory policy making can lead to rather powerful selective incentives (for example, because physician reimbursement by statutory sickness funds is channeled in Germany through regional doctors' associations, only physicians who are association members can receive reimbursement). The decline of some groups, therefore, can be the result of government policy; an example is the decline of British labor unions as a result of neo-liberal policies. Deregulation can also lead to a decline in the self-regulatory activities that groups perform, and hence to a loss of selective incentives. In addition, the change in salient policy issues might reduce the relevance of politics to the group members, and thereby reduce the value of collective behavior.

Lastly, theories of conditional cooperation argue that cooperation can be an equilibrium outcome of games in which the decision of one actor to cooperate can be made conditional on the cooperation of other actors. For example, Axelrod shows that in repeated Prisoners' Dilemma games, cooperation can be a Nash equilibrium strategy (1984).<sup>12</sup> In order for this to happen, however, the actors have to have a large time horizon. A possible explanation for group failure, therefore, could be that it has become more likely that the interaction between groups will end in the near future. In other words, group failure could be the result of a self-fulfilling prophecy. The problem with this argument is that it is difficult to determine what ending interaction would mean in an interest group context. In formal terms, it means that the game ends (or is likely to

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12 Other conditions for conditional cooperation have been noted. Hardin (1982), for example, discusses overlapping group activities – that is, the possibility that a set of actors will interact in different contexts. Defection in one context can then be punished by defection in another context.

end) in the near future. Does this mean that the relevance of the political arena is likely to vanish for a particular group? Does it mean that some group members will cease to exist – for example, due to economic problems?

Some explanations of group failure that I deduced from the existing literature are not applicable to the case that I am investigating here. The argument that group members lose interest due to the declining relevance of politics for their industry is not useful because the breakup of the BPI happened at a time when the government was intervening heavily in the pharmaceutical market: Politics was highly relevant; the breakup was accompanied by strong political conflicts within the group. It does not seem plausible that it was a lack of political entrepreneurship that caused the crisis. In fact, the BPI's executive director during the crisis, Hans Rüdiger Vogel, was actively trying to change the association in a way that could accommodate the dissenters' demands (Frankfurter Allgemeine Zeitung 1993e). In addition, the fact that the BPI's split-up led to the formation of two new associations indicates that there was not a lack of entrepreneurship. With respect to conditional cooperation, the interaction between different actors in the pharmaceuticals sector was not likely to end any time soon – and it hasn't ended yet (although some actors now belong to different associations).

Which elements of the existing theories are useful for the case under study? First of all, selective incentives are important. I will show that one of the problems turned out to be the fact that the most powerful selective incentive was not a purely private good. However, the failure of selective incentives cannot provide the complete picture. If it is only the loss of selective incentives that leads to group failure, we should observe a relatively peaceful dissolution – members simply lose interest. As I have already mentioned, this was not the fact in the present case. Second, the nature of political issues is important. We will see that changing political issues played a major role in destabilizing the association.

A third element that will be important in the present analysis is the heterogeneity of group members. However, I approach heterogeneity in a manner that is different from Olson's. For Olson (and other collective action theorists), heterogeneity refers to the question of how highly different actors value the benefits of collective action. These valuations are basically fixed. I argue, in contrast, that the heterogeneity of group members does not stem from the fact that some demand more or less of a good, but rather from the fact that different actors demand *substantively different* goods.

In order to model the substantive heterogeneity of interests in a group, I make use of concepts employed in theories of bargaining. In particular, I argue that we can use so-called spatial models to analyze the different political options that different actors prefer, and we can determine which compromise positions lead to different levels of utility for the various actors (Enelow/Hinich 1984). As a result, I combine an investigation of collective action and bargaining.

The combination of bargaining and collective action allows me to introduce a type of mechanism for conditional cooperation that is different from the one proposed by Axelrod. In my model, the actors can make their contribution to the collective good conditional on their influence in the bargaining process. This means that under certain conditions, collective action can be individually rational. This is where the nature of political issues comes in: The mechanism of conditional cooperation that I propose is strong (that is, all actors strictly prefer to cooperate) only if the political issues – and, accordingly, the actors’ utility functions – have certain characteristics that I will define in the following model.

### Basic assumptions

Let us assume that there are three factions<sup>13</sup> attempting to influence pharmaceuticals policy. We call one of them *SME* and another *MNC*. Although the names are purely coincidental and do not influence the results of this investigation, let us say that *SME* is a faction of small and medium-sized pharmaceutical companies, and *MNC* consists of multinational, research-oriented companies. The third faction that tries to influence policy, *SHI*, can be thought of as representing statutory health insurances. At the start of the game, *SME* and *MNC* form a coalition, which we call *BPI*. We are mainly interested in the question of whether *SME* and *MNC* will continue their coalition or whether they will dissolve it. We are not interested in *SHI*’s strategy; we include it in the model to increase realism, although, as it turns out, we could just as well leave it out of the model.

The different factions make policy proposals on pharmaceuticals policy; the factions that are part of a coalition make a common policy proposal. I formalize this with a spatial model, using weighted Euclidean distances as a basis for utility functions. I assume that there is a two-dimensional policy space. For example, let us say that the issue is cost controls. Then we can say that one dimension represents the overall reduction in medicine prices, and a second dimension represents whether the price reduction affects mostly innovative medicines or generics. As a further example, consider the issue of pharmaceuticals registration. Again, we can identify a two-dimensional policy space. One dimension is the strictness of registration controls, and the other dimension is the degree of governmental or industrial control of regulatory decisions.

For each faction, we can identify the highest policy preferences using so-called ideal points – that is, points in the policy space that identify each faction. I use the symbols  $i_{SME}$ ,  $i_{MNC}$ , and  $i_{SHI}$  to identify the ideal points of the three factions.

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13 I use the term “faction” here in the Madisonian sense – factions in society. I prefer this term to other possible choices – “groups,” “interests,” etc. – because it is general, indicates difference of interest, and we do not easily confuse factions with organized associations.

The policy benefit each faction receives from a policy outcome is based on the distance between its ideal point and the outcome. We conceptualize the policy outcome as a point,  $o$ , in the (two-dimensional) policy space, so that  $o = (o_x, o_y)$ . We then say that the policy benefit for a faction – I use *SME* as an example – is the negative of the distance between its ideal point and the outcome:

$$-||i_{SME} - o||_{SME} = -\sqrt{(i_{SME,x} - o_x)^2 + (i_{SME,y} - o_y)^2}. \quad (1)$$

Now, this conceptualization of *SME*'s benefit assumes that the faction evaluates both policy dimensions of the issue equally. This might make sense for an issue such as cost reduction: *SME* wants little overall cost reduction, and larger cost-reduction for innovative medicines (which tend to be produced by the larger companies). However, this might not be true for other issues. Take, for example, pharmaceuticals registration: It has been argued that *MNCs* preferred stricter registration requirements that would increase their products' international competitiveness. In addition, they preferred a relatively high level of government control to assure confidence in international markets (in contrast, *SMEs* preferred a lower level of government control than the *CMEs*; cp. Westphal [1982: 217ff.]). However, strictness of registration requirements was the more important issue from the *MNCs*' perspective, whereas the implementation of the requirements was secondary. Let us say that strictness is represented by the  $x$ -axis of the policy space (outcome  $o_x$ ), and government control by the  $y$ -axis (outcome  $o_y$ ). Then, *MNC*'s policy benefit would be

$$-||i_{MNC} - o||_{MNC} = -\sqrt{\alpha_{MNC,x} (i_{MNC,x} - o_x)^2 + \alpha_{MNC,y} (i_{MNC,y} - o_y)^2} \quad (2)$$

with  $\alpha_{MNC,x} > \alpha_{MNC,y}$ . In technical terms, the policy benefit is conceptualized as a negative *weighted* Euclidean distance (Enelow/Hinich 1984).

The different factions have lobbying budgets, which I denote by  $b_{MNC}$ ,  $b_{SME}$ , and  $b_{SHB}$  respectively. I assume that the factions spend all of their lobbying budgets. The rationale for this assumption is the fact that, once lobbying budgets are allocated, their costs are sunk and it is rational to spend them.<sup>14</sup>

The main question that the model poses is whether *SME* and *MNC* maintain their coalition, in the form of an association. I assume that there is a political entrepreneur who organizes the association, and who prefers for the association to exist.<sup>15</sup> The entrepreneur has to submit an association policy proposal and offer selective incentives. There are several actors who can be such political entrepreneurs. Usually, it is an association's secretariat that plays this role, by proposing and negotiating association positions and arranging for the services that an association provides (such as information about important policy issues, studies on industry developments, etc.).

14 Strictly speaking, then, this is not an assumption but a proposition that can be proven; I state it as an assumption to save space.

15 We can formalize this by saying: If the association is successfully established, the entrepreneur receives a utility of 1; otherwise, she receives a utility of 0.

I assume that the factions, or the coalition/association, are agenda setters in the sense that one of their proposals becomes policy. This assumption is based on the consideration that more resources are required from policy makers – mostly in terms of expertise – to develop independent policy proposals. Such a resource-based argument is particularly credible in highly technical policy areas such as health care policy. The agenda setting role of factions can be implicit in the sense that they may not make a proposal at the beginning of the policy process. They may just as well defend the status quo, which implies that they do not propose a new policy solution. They are agenda setters, however, in the sense that one of their (implicit) proposals will become the government's policy choice.

The probability that a faction's policy proposal will become law depends upon the resources that the faction puts into lobbying for the proposal. This probability is based on Tullock's ratio probability model (1980). As an example, assume that *MNC* spends its entire budget lobbying for its ideal point,  $i_{MNC}$ , and that nobody else lobbies for this policy. Then, the probability that  $i_{MNC}$  will become law is

$$p(i_{MNC}) = \frac{b_{MNC}}{b_{MNC} + b_{SME} + b_{SHI}}. \quad (3)$$

Now, assume that the entrepreneur has proposed association policy  $c$ , and *SME* decided to contribute a share of its budget – call it  $\hat{b}_{SME}$  – to support  $c$ . Similarly, *MNC* decides to support  $c$  with  $\hat{b}_{MNC}$ . Then, the probability that  $c$  becomes law is

$$p(c) = \frac{\hat{b}_{MNC} + \hat{b}_{SME}}{b_{MNC} + b_{SME} + b_{SHI}}.$$

The utilities that the factions realize at the end of the game consist of the possible policy benefits (that is, the negative Euclidean distances), weighted by the probabilities of their implementation, plus the selective incentives,  $s$ , provided by the entrepreneur. Taking *MNC* as an example,

$$u_{MNC} = -p(c)\|i_{MNC} - c\|_{MNC} - p(i_{SME})\|i_{MNC} - i_{SME}\|_{MNC} - p(i_{SHI})\|i_{MNC} - i_{SHI}\|_{MNC} + s \quad (4)$$

( $\|i_{MNC} - i_{MNC}\| = 0$ , therefore this term drops out of the equation).

The game sequence can be summarized as follows:

1. A political entrepreneur proposes a coalition (association) between *SME* and *MNC*. This includes proposing a common policy position and offering selective incentives for joining the association.
2. The two factions consider which share of their lobbying resources they should contribute to the coalition/association, and which share they should spend on lobbying for their own most preferred policy.

3. All actors lobby, and the government chooses one of the proposed policies and implements it. Utilities are realized.

The formal solution of the game is presented in the appendix; in the following section, I provide a less technical discussion of the results. First, I discuss the results that occur when the entrepreneur presents a constant association policy – that is, a policy that cannot be changed by the factions that join the association. This produces the classical free-rider result. After that, I present the results that occur under a mechanism that allows for association members to influence the association policy proposal. In particular, I examine institutional mechanisms under which the location of the proposal is contingent on the contributions of the association members.

### Constant association policy: The free-rider outcome

Let us assume that the entrepreneur proposes a specific coalition policy,  $c$ , that is a “constant point” in the policy space. This means that this point will be association policy, independent of which faction is a member of the association, and which share of its lobbying resources it contributes. We can say:

**Proposition 1** Assume that  $c$  is a constant and  $s = 0$ . Then  $\hat{b}_{SME} = \hat{b}_{MNC} = 0$ .

In other words, neither *SME* nor *MNC* will contribute to the association if they cannot influence the common policy and if there are no selective incentives. This is similar to the classic free-rider outcome that individually rational actors tend not to contribute to common goods. The proof for this proposition is simple. Take *SME* as an example: Since *MNC*'s contribution to  $c$  is a constant – that is, not influenced by *SME*'s contribution – *SME* maximizes its expected policy benefit by lobbying for its most preferred policy. Since the equivalent holds for *MNC*, there will be no cooperation between the two actors.

The free-rider result stated in Proposition 1 differs from Olson's collective-action problem. First, Olson does not necessarily conclude that there will be no cooperation. Instead, he argues that contributions to the collective good would be suboptimal, although under certain circumstances they could be positive. Here, the result is that there will be no contributions to the association policy. Second, Olson assumed that the common good would be preferred by both actors. Here, this is not always the case, as I show below.

The question, then, is: When does an association benefit both actors? In other words, when do the two factions become victims of a Prisoners' Dilemma situation in which cooperation would be beneficial but not individually rational?

In order to answer this question, we have to compare the factions' expected utilities under independent lobbying with their utilities under cooperation. For argument's sake, let us assume that each faction either spends its entire budget on its own policy proposal, or contributes everything to the association. Then, in the case of *SME*, the benefits of mutual cooperation are weakly larger than its utility from non-cooperation if

$$\begin{aligned}
& -\frac{b_{SME}+b_{MNC}}{b_{SME}+b_{MNC}+b_{SHI}}\|i_{SME}-c\|_{SME} \\
& \quad -\frac{b_{SHI}}{b_{SME}+b_{MNC}+b_{SHI}}\|i_{SME}-i_{SHI}\|_{SME} \\
& \quad \geq \frac{b_{MNC}}{b_{SME}+b_{MNC}+b_{SHI}}\|i_{SME}-i_{MNC}\|_{SME} \\
& \quad \quad -\frac{b_{SHI}}{b_{SME}+b_{MNC}+b_{SHI}}\|i_{SME}-i_{SHI}\|_{SME},
\end{aligned}$$

which can be simplified to

$$-\frac{b_{MNC}}{b_{SME}+b_{MNC}}\|i_{SME}-i_{MNC}\|_{SME} \geq \|i_{SME}-c\|_{SME}. \quad (5)$$

Similarly, from *MNC*'s benefit:

$$-\frac{b_{SME}}{b_{SME}+b_{MNC}}\|i_{SME}-i_{MNC}\|_{MNC} \geq \|i_{MNC}-c\|_{MNC}. \quad (6)$$

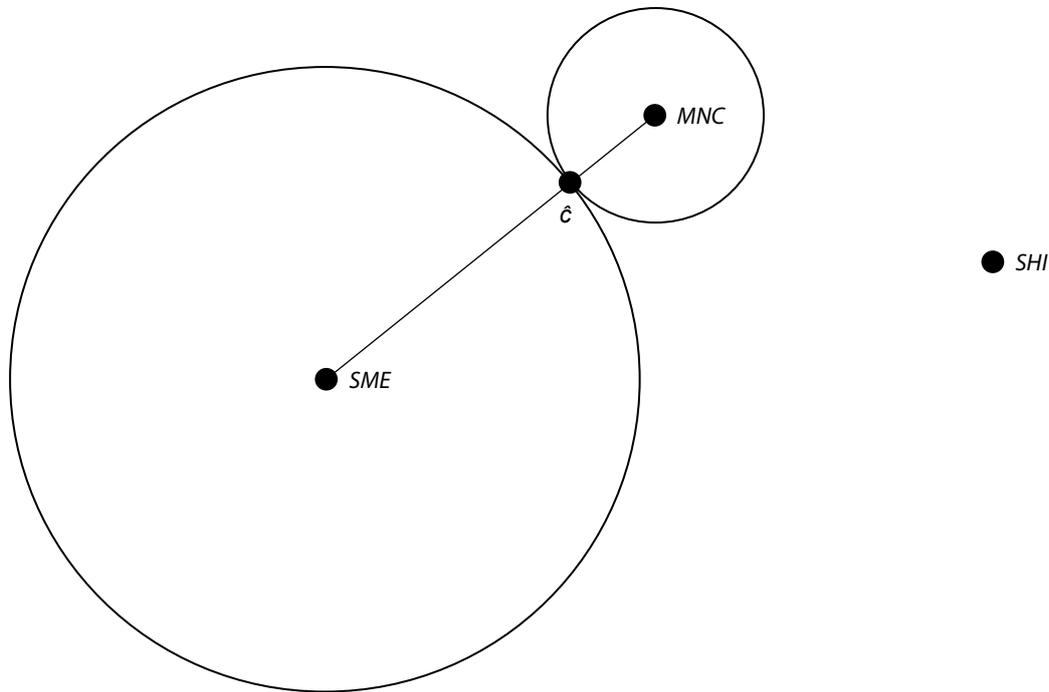
It is easy to show that equations 5 and 6 hold with equality if

$$\tilde{c} = \left( \frac{b_{SME}}{b_{SME}+b_{MNC}}i_{SME,x} + \frac{b_{MNC}}{b_{SME}+b_{MNC}}i_{MNC,x}, \frac{b_{SME}}{b_{SME}+b_{MNC}}i_{SME,y} + \frac{b_{MNC}}{b_{SME}+b_{MNC}}i_{MNC,y} \right). \quad (7)$$

That is,  $\tilde{c}$  is a point on the line connecting  $i_{SME}$  and  $i_{MNC}$ . Now, if we find a point in the policy space that both *MNC* and *SME* prefer to  $\tilde{c}$ , then a coalition between the two actors produces policy benefits, and Proposition 1 refers to a situation resembling a Prisoners' Dilemma. I give the geometric intuition of the argument here; the formal proof is in the appendix.

Consider the policy benefit measure proposed in equation 2. If the " $\alpha$ " parameters in this equation are equal, the actor values both issue dimensions equally. We can plot equation 2 on a system of coordinates that represents the two issue dimensions; the result is a circular indifference curve, consisting of all points that supply the actor with the same policy benefit.

**Figure 1** Two actors with equal evaluation of policy dimensions



If both *SME* and *MNC* have circular indifference curves<sup>16</sup> – that is, if they value the issue dimensions equally – their indifference curves that contain  $\hat{c}$  will intersect exactly at  $\hat{c}$ , but at no other point (see Figure 1). Since each actor strictly prefers all points (and only those points) that are within the indifference curve to those that are on or “outside” the indifference curve, there are no policy choices that both *SME* and *MNC* prefer to  $\hat{c}$ . As a result, the lack of cooperation under proposition 1 does not lead to any expected policy losses.

Now, consider the situation in which not all “ $\alpha$ ” parameters are equal. In particular, assume that

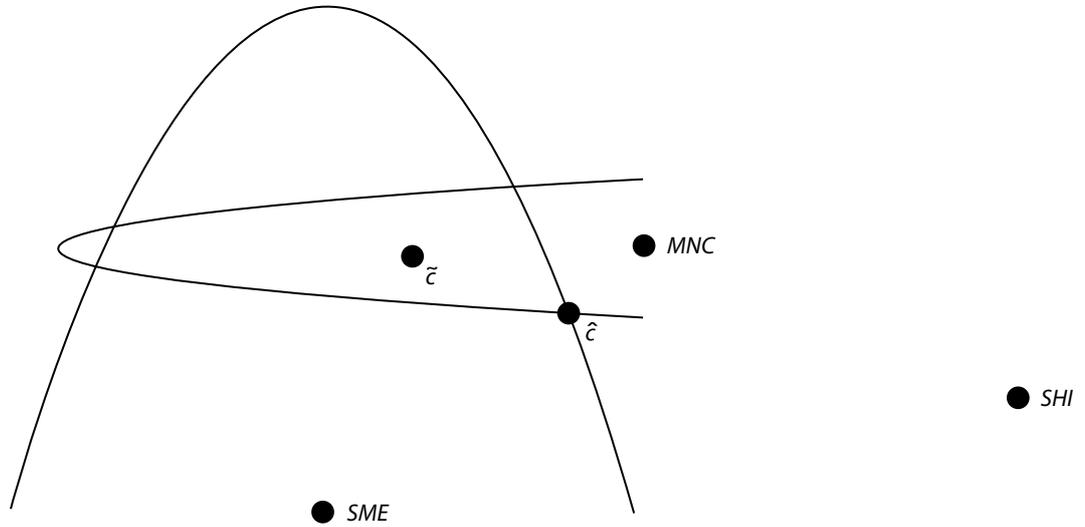
$$\frac{\alpha_{SME,x}}{\alpha_{SME,y}} \neq \frac{\alpha_{MNC,x}}{\alpha_{MNC,y}}$$

In this case, the indifference curves of *SME* and *MNC* that go through  $\hat{c}$  intersect such that there are points inside both curves. As a result, there are policy positions that both *SME* and *MNC* prefer to  $\hat{c}$ . This means that cooperation can lead to positive policy gains, and the lack of cooperation in proposition 1 describes a Prisoners’ Dilemma. The following lemma describes the conditions for this to happen:

**Lemma 1** If  $\frac{\alpha_{SME,x}}{\alpha_{SME,y}} \neq \frac{\alpha_{MNC,x}}{\alpha_{MNC,y}}$ ,

then mutual cooperation can lead to positive policy gains, compared to independent lobbying by *SME* and *MNC*.

16 An alternative condition is that  $\frac{\alpha_{SME,x}}{\alpha_{SME,y}} = \frac{\alpha_{MNC,x}}{\alpha_{MNC,y}}$ .

**Figure 2** Two actors with unequal evaluation of policy dimensions

Substantively, this means that policy gains are possible if both factions evaluate the issue dimensions differently, so that they can trade policy concessions on one issue dimension against policy gains on another dimension. Compare figure 2: In the case in which the indifference curves are oval-shaped, both *MNC* and *SME* prefer  $c$  to  $\hat{c}$ .

Independent of the shape of the factions' indifference curves, if association policies are constant, the entrepreneur has to provide selective incentives. There are different ways to conceptualize selective incentives. For example, the entrepreneur could pay a selective incentive to faction  $l$  (I use  $l$  and  $k$  as wildcards for the different factions) that is a continuous function of its contribution in support of the association policy:  $s(b_l)$ . In other words, if an actor contributes a larger share of his budget to the coalition, then he will receive a larger selective incentive; the function  $s(b_l)$  determines to what extent contributions to the coalition “translate” into selective incentives. We can then show (see the appendix):

**Lemma 2** If  $s = f(\hat{b}_l)$ , then  $\hat{b}_l = b_l$  if

$$\frac{\partial s(\hat{b}_l)}{\partial \hat{b}_l} > \frac{1}{b_{SME} + b_{MNC}} \|i_l - \tilde{c}\|_1, 0 \leq \hat{b}_l \leq b_l \quad (8)$$

where  $\tilde{c}$  is the common policy proposal.

This means that the entrepreneur can induce a faction to contribute its entire resources to the coalition if the selective incentives react strongly enough to changes in contributions. Also, Lemma 2 shows that (marginal) selective incentives have to increase as the distance between a faction's ideal point and the proposed coalition policy increases. This is very intuitive: An actor makes larger policy concessions when he joins the group only if his concession is compensated by a larger selective incentive.

### Association policy as a function of member contributions

We have confirmed that coalition building between political actors leads to free-rider problems, even if the two actors have different interests. The two main solutions to the free-rider problem are selective incentives (which are part of the model) or conditional contributions. I propose an implementation of the conditional contribution mechanism that is based on the conditional definition of the common good – that is, the policy position. This is a practice commonly encountered in interest groups: The idea is that those actors who contribute more to the interest group have a stronger influence on determining its policy goals. At the very least, actors who do not contribute do not have the right to influence the group policy.

I incorporate the idea of conditional association policies by assuming that the political entrepreneur does not propose a particular policy, but rather establishes a decision making process that determines  $c$ . Under this process,  $c$  moves closer to  $i_{SME}$  if *SME* contributes more of its budget to the association, and it moves closer to  $i_{MNC}$  if *MNC* contributes more.

Here, I propose a very simple version of this argument. Suppose we use the following mechanism to determine  $c$ :

$$c = \begin{cases} i_{SME} & \text{if } \hat{b}_{SME} = b_{SME} \text{ and } \hat{b}_{MNC} = 0 \\ i_{MNC} & \text{if } \hat{b}_{MNC} = b_{MNC} \text{ and } \hat{b}_{SME} = 0 \\ \tilde{c} & \text{if } \hat{b}_{MNC} = b_{MNC} \text{ and } \hat{b}_{SME} = b_{SME} \\ k & \text{if } \hat{b}_{MNC} = 0 \text{ and } b_{SME} = 0 \end{cases}$$

In effect, the entrepreneur gives each faction the choice of contributing its entire budget to the association, or of contributing nothing. If both factions contribute their budgets, the association will pursue a common policy; if only one faction contributes its budget, the entrepreneur will pursue the contributing faction's ideal policy.

Of course, there are other mechanisms that we could think of. In particular, a more general mechanism would be one in which each faction splits up its budget between a “private” policy and the association policy in any way it likes. The solution to this mechanism, however, depends on the exact shape of the relationship between policy and contributions. In some cases, this makes the derivation of solutions very difficult. In other cases, it can be shown that the factions either prefer to contribute their entire budgets or nothing at all. As a result, under a number of conditions, our simplifying mechanism is endogenous to the game.

In addition, the simple mechanism that I propose here is fairly realistic. Association fees tend to be a fixed amount determined by the associations. Members either join and pay

the demanded fee, or they stay outside; they usually do not have a choice between different fee levels.

This institutional setup transforms the game and offers an institutional solution to the collective action dilemma:

**Proposition 2** If  $c$  is determined according to equation 9, there exists at least one  $c$  such that both actors weakly prefer to pool their lobbying resources in favor of  $c$ , even in the absence of selective incentives.

While with constant association policy – and without selective incentives – defection (that is,  $\hat{b} = 0$ ) is a dominant strategy, with conditional association policies it is weakly dominated. If a faction remains in the association, it can never be worse off than with independent lobbying, and under some conditions it can be better off.

Staying in the association is a strictly dominant strategy if the association policy makes both factions strictly better off, compared to independent lobbying. The conditions for this have been already noted above: If, for both factions,

$$\frac{\alpha_{SME,x}}{\alpha_{SME,y}} = \frac{\alpha_{MNC,x}}{\alpha_{MNC,y}},$$

there is no point in policy space that both actors strictly prefer as association policy. However, if

$$\frac{\alpha_{SME,x}}{\alpha_{SME,y}} \neq \frac{\alpha_{MNC,x}}{\alpha_{MNC,y}},$$

then the entrepreneur can propose an association policy that induces both actors to join the coalition.

Intuitively, this result means that if both factions evaluate the issue dimensions differently, and if the different evaluations are partly complementary, then forming a coalition produces a “policy surplus” that an entrepreneur can use to maintain an association. In this case, no selective incentives are necessary. However, if both factions evaluate the two policy dimensions equally, cooperation does not produce any policy benefits beyond those of independent lobbying; the entrepreneur can therefore induce cooperation by offering a minimal selective incentive,  $\epsilon$ .

## Summary of results

The model that I use to analyze the break-up of the BPI and the founding of the VFA produces hypotheses about the conditions under which associations require selective incentives to organize, and about the size of those selective incentives. Table 1 summarizes these hypotheses. First, the model presented here suggests that it is important for coalition policies to reflect the relative contributions of different factions (“responsive  $\tilde{c}$ ”).

If a faction contributes more to the lobbying efforts of the coalition/association, then it has to have more influence on the coalition's policy position. If coalition policy is not responsive to member contributions ("exogenous  $\tilde{c}$ "), selective incentives are needed to convince the factions to join the coalition.

Second, even with responsive coalition policies (i.e., those that reflect member contributions), selective incentives are necessary if members attach equal weights to different issue dimensions ( $\alpha_{SME,x} = \alpha_{MNC,x}$  and  $\alpha_{SME,y} = \alpha_{MNC,y}$ ). These selective incentives can be minimal ( $\varepsilon$  as a symbol for a small amount), compared to the selective incentives under non-responsive coalition policies. If members attach differing weights to the issue dimensions ( $\alpha_{SME,x} \neq \alpha_{MNC,x}$  and/or  $\alpha_{SME,y} \neq \alpha_{MNC,y}$ ), no selective incentives are necessary if coalition policies are responsive.

### Back to German pharmaceutical interests

Now, how can we use the theoretical arguments made in the previous section to explain the break-up of the BPI? We have to explain not only why the big members left the association, but also why it happened in the early 1990s.

I argue that there were two changes whose consequences can be appreciated using my theoretical arguments. First, the dominant issues changed; second, the effectiveness of the association's selective incentives changed.

**Table 1 Policy benefits and necessary selective incentives**

	Policy benefits of cooperating	$s$
exogenous $\tilde{c}$	$\leq 0$	$\geq \varepsilon$
responsive $\tilde{c}$		
$\alpha_{SME,x} = \alpha_{MNC,x}$ and $\alpha_{SME,y} = \alpha_{MNC,y}$	0	$\varepsilon$
$\alpha_{SME,x} \neq \alpha_{MNC,x}$ and/or $\alpha_{SME,y} \neq \alpha_{MNC,y}$	$> 0$	0

### Changing issues: Safety versus price control

In section 2 of this paper, I argue that we can distinguish three general periods in pharmaceuticals policy. The first period, from the early 1960s to the mid-1970s, was dominated by the issue of pharmaceutical safety; it resulted in the new pharmaceuticals law

of 1976. The second and third periods were dominated by the issue of cost control for the statutory sickness funds. Between the late 1970s and the late 1980s, the cost control measures affected mostly smaller and non-innovative medicine producers. The cost control measures of the early 1990s, however, affected the large and innovative producers.

I argue that in all three periods, large innovative producers and SMEs tended to have different positions on the issues. With respect to pharmaceuticals registration, however, the two factions tended to evaluate the various issue dimensions differently, and a compromise was possible. On the issue of cost control, however, this was not the case.

As I already noted in section 3.1, we can characterize the question of pharmaceuticals registration as a two-dimensional problem: On the one hand, the question was to what extent the safety and efficacy of medicines had to be proven; on the other hand, the degree to which the implementation of the regulations would be left to the industry needed to be determined. As I noted, the large multinationals were interested in stricter, credibly enforced regulations that would facilitate the export of their products. The smaller, domestically oriented companies were interested in low-cost regulations, which implied a low level of requirements and industry-controlled implementation.

Westphal notes that for the large pharmaceutical companies, it was particularly important to incorporate internationally accepted safety and efficacy regulations into pharmaceutical registration requirements. The actual implementation of those regulations was less important (1982: 219). The domestically oriented pharmaceutical *SMEs*, in contrast, were worried mostly about the possibility of what they thought would be governmental and sickness fund interventions into the market (cf. the statements made by then-BPI chair Sorge, quoted by Westphal 1982: 218). As a result, *SMEs* and large companies evaluated the importance of the issue dimensions differently and were able to find a compromise: stricter regulatory requirements but rejection of state intervention into the market (Westphal 1982: 219).

Did the participation of the two factions in the BPI determine the compromise position? This question is difficult to answer in detail. However, the fact that the BPI position constituted a compromise between the large-firm and *SME* positions suggests that the participation of both factions made a difference. It is plausible that non-participation of, say, the multinational companies in the BPI would have led to the association's rejection of new registration requirements.

The question of pharmaceutical cost control can also be analyzed as a two-dimensional issue: On the one hand, the question concerns the extent to which pharmaceutical expenses should be reduced; on the other hand, it concerns the extent to which the reduction should affect low-cost or high-cost, innovative medicines. The first policy dimension (the degree to which expenses should be reduced) has a lower limit, which is what both factions prefer: They are clearly against reduction in pharmaceutical expenses. As far as the other question is concerned, there is a conflict of interest between *SMEs* and

big innovative companies.<sup>17</sup> While cost-cutting measures such as fixed prices,<sup>18</sup> *aut-idem* rules,<sup>19</sup> or “negative lists” of medicines that will not be reimbursed by sickness funds tend to affect the prices of less innovative, low-cost medicines, measures such as positive lists,<sup>20</sup> budgeting of prescriptions, or price controls of non-generic medicines tend to affect the prices of new, higher-priced medicines. Since both factions equally prefer less cost control – and equally prefer not to be affected by cost controls – their indifference curves have the same shape. Therefore, they cannot expect any strict policy gains from cooperation; the association has to be sustained by selective incentives.

Although a number of cost controls had been implemented since the late 1970s,<sup>21</sup> the interaction between pharmaceutical *SMEs* and large companies became clearly redistributive with the 1989 Health Care Reform Act. The reform extended the existing negative list, introduced fixed prices for medicines with the same pharmacological substances,<sup>22</sup> and facilitated price competition – and thus clearly threatened to reduce the income of pharmaceutical companies (Bundesverband der Pharmazeutischen Industrie 1989; Schneider et al. 1993). Furthermore, the reforms affected in particular the producers of generics and medicines for routine indications.

In this case, it is difficult to evaluate whether the BPI’s position was conditional on the members’ participation in the association and on the strength of its members. Essentially, the BPI represented the position of the small and medium-sized companies – opposing the negative list, fixed prices, and so on (BPI 1989). Since the large multinationals represented a strong faction of the pharmaceuticals sector, the question remains whether they would not have been better off lobbying on their own account. Although this question cannot be clearly answered, it is likely that the BPI’s position did not reflect the relative importance of its members and hence contributed to the tensions between the two factions.

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17 Obviously, this is a simplification, as many big pharmaceuticals producers also produce generics and other not-so-innovative medicines, while there are some innovative small companies, particularly in the biotechnology sector.

18 In the German system, fixed prices applied only to “comparable” medicines; the patient had to pay the difference between the actual price of a product and the fixed price (Webber 1989: 275). In 2001, the German cartel office overturned the determination of fixed prices by physicians and sickness funds: They are now determined by the ministry of health and the Bundesrat (Frankfurter Allgemeine Zeitung 2001a,b).

19 Prescription of a pharmaceutical substance instead of a particular brand, requiring the pharmacist to issue the least expensive preparation.

20 This is a list which contains all pharmaceuticals that sickness funds will reimburse; new medicines may not be immediately included in this list. Although successive health care reforms announced that they would introduce positive lists, this has not happened yet.

21 For example, the 1977 Cost Control Act introduced so-called maximum prices for the reimbursement of certain medicines and higher patient co-payments, and excluded medicines for certain routine indications from reimbursement (Schneider et al. 1993; Webber 1988).

22 It also set a time schedule to introduce fixed prices for medicines with comparable pharmacological substances and for medicines with comparable pharmacological/therapeutic effects.

The reaction of the pharmaceutical *MNCs* to the 1992 Health Care Structural Act is more indicative of the validity of the theoretical framework. The cost controls introduced by the 1992 law affected the innovative pharmaceuticals sub-sector in particular: Among other measures, it introduced budgets for prescription medicines paid by the sickness funds, and it imposed a five-percent price reduction for those pharmaceuticals not subject to fixed prices (that is, new medicines). In reaction to this, the large innovative producers – particularly the group organized in the *Medizinisch-Pharmazeutische Studiengesellschaft* (Medical-Pharmaceutical Study Society, MPS) – proposed policies that reduced pharmaceutical expenses but favored their segment of the market. For example, the innovative producers proposed to divide prescription drugs into three segments: First, life-saving medicines should be completely paid for by sickness funds; second, necessary and effective medicines should be partially reimbursed; and third, medicines for minor health complaints should be paid for by the patients (Frankfurter Allgemeine Zeitung 1994a,b). These policies were not acceptable to the small and medium sized companies, whose segment of the market would have been particularly affected.

In addition to the conflict over policy, the large and innovative companies complained about the BPI's decision making structure. Although they paid higher membership fees, big companies had the same voice in the general assembly as small companies. In addition, the large companies complained that the BPI's regional structure, which constituted the foundation of equal representation of firms, resulted in bothersome and slow decision making processes. Their proposal for reform – transforming the direct-membership association into a mixed association that admitted sub-sectoral groupings as corporate members – was rejected by a critical minority of members (Frankfurter Allgemeine Zeitung 1993a,b,c). While the distributive conflict made it impossible for the two groups to find mutually beneficial compromises, the structural conflict reveals that the representational structure did not reflect the political importance of the different segments of the industry. The resulting association policy did not reflect membership contributions.

### Selective incentives: The changing Red List

Considering that the BPI was unable to maintain a coalition based on policy, we have to consider the potential role of selective incentives. The main incentive that had the power to keep the association together, despite internal conflicts, was the so-called “Red List.” As noted above, only products manufactured by BPI members could be listed. Since the list was used by many physicians and dentists to determine which medicine to prescribe, losing a place on the list could be economically devastating.

Why didn't the Red List prevent the group of large innovative companies from leaving the association? The list constituted a selective incentive in the sense that it was possible

to exclude defectors from it. However, its benefits had to be jointly provided, that is, a sufficient number of firms had to participate in the association for the good to be valuable. As a result, single defectors could be punished by exclusion from the list. However, if a group of firms that accounted for approximately 50 percent of the market defected, the Red List lost most of its value. This is what happened when the group of firms that later joined the VFA left the BPI. Since 1996, the Red List has been published jointly by the BPI and the VFA (Bundesverband der Pharmazeutischen Industrie 2001).

Thus, we have a three-part explanation for the split-up of the BPI: A policy issue that did not allow for mutual policy gains; the failure of the decision making process to reflect the relative political power of the different actors; and the failure of the selective incentive in the face of the defection of a large group of members.

But why did the BPI's small-firm members allow this to happen? Why didn't they compromise to keep the big firms in the association? The theoretical discussion suggests that due to the fact that the policy issue did not allow for mutual gains from cooperation, there was no political reason to cooperate. Interestingly, it was the BPI's administration that tried to keep the big firms in the association; the small members were not that eager (Frankfurter Allgemeine Zeitung 1993a,b).

There may have been other factors that the model does not capture. For example, there was a cultural conflict between small-firm representatives, usually owners, and large-firm representatives, often managers with an international orientation. This may have led to an episode in which a representative of a large multinational was not elected to the council, which then increased the tensions between the two groups of firms.<sup>23</sup> In addition, it may have been difficult for the many small members, or their representatives, to coordinate in order to negotiate a compromise with the big firms. In this sense, the association might have fallen victim to a second-degree collective action problem.

## Conclusion

This paper has attempted to answer a substantive and a theoretical question. Substantively, I tried to explain why many large pharmaceutical producers left their industry association in 1993/1994 and formed a new association that specifically represented multinational, research-focused firms. Theoretically, I proposed a formal model of association formation that combined collective action with a bargaining problem. By relating interest group formation to factors that are likely to change over time, I advanced a general explanation of interest group change.

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23 Interviews with representatives of German pharmaceutical associations, April 17 and May 14, 2002.

The theoretical results are quite intuitive: First, it is important that association policy reflects the relative strength of the association members. Second, associations are strongest if the issues are multidimensional and if members put different valuations on the issue dimensions, as this allows for policy trades. Third, selective incentives can keep associations together if nothing else works. As a result, if issues change, internal interest group politics change, too. In particular, if redistributive policy issues become salient, it is more difficult to maintain a coalition of actors who are on different sides of the redistribution.

In addition to these common-sense conclusions, the formal model also provides us with more subtle insights. For example, although selective incentives can be used to uphold an association, they are particularly important if association members evaluate policy dimensions similarly. Conversely, selective incentives are not necessary if policy deals between members are possible, that is, if members evaluate policy dimensions differently. In addition, the reliance on selective incentives can be minimized if participation in the association is a condition for influence on association policy. As a result, although selective incentives are always useful, their importance can fluctuate with policy issues. This can lead to changes in the character of an association, from an association based on purposive incentives to an association based on selective incentives.<sup>24</sup>

Another insight relates to the impact and the nature of power: Powerful factions have to be more influential in internal association politics than less powerful factions. Power is related to the size of a faction's lobbying budget, which can be expected to correspond to a firm's overall size – but it is not identical to it. In any case, egalitarian internal democracy does not further the maintenance of a voluntary association.

With respect to this paper's substantive question, the answer encompasses several of the arguments made formally. First, one of the problems that led to the desertion of large multinational pharmaceutical companies from the BPI was the egalitarian type of democracy. Large and important pharmaceutical producers complained that their influence in the internal decision making process did not correspond to their political weight. Second, the increasing expenditures of statutory sickness funds became a prominent issue in the 1980s and 1990s, and the solution was sought in the reduction of pharmaceutical expenses. This created redistributive conflicts between factions within the pharmaceutical industry that were not easily amenable to compromise. Third, the main selective incentive that the BPI relied on was not a pure private good; it could only be supplied if a sufficient number of producers stayed within the association. As a result, the incentive was not sufficient to prevent the group of big companies from leaving the BPI.

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24 To use Schmitter and Streeck's terminology, the association could change from one emphasizing the logics of membership and influence to one emphasizing the logics of service and efficiency (1999).

For associations, the results of this study suggest that the relative power of their members has to be respected. Members with more political weight have to be given more influence on association policy than members who are not very politically active. Sometimes implementing this policy is easy, since big members are simply more active in the association and constitute political leaders that smaller members respect. However, in cases such as that of the BPI, which had a rather egalitarian decision making process, small members may be reluctant to reduce their own influence on association policy, particularly if this may lead to economic losses. In such cases, maintaining an association can become a serious challenge.

For political decision makers – and for citizens as well – the results of this study may be somewhat disconcerting. On the one hand, they suggest that interest groups should be able to aggregate the political demands of some social sectors. This may be politically useful, since it simplifies democratic decision making processes. On the other hand, the compromises reached do not necessarily reflect the ideals incorporated in modern democracies – in particular, the political equality of all citizens. Factions that can employ a large amount of resources will be able to shape association policy more strongly than factions with fewer resources. This is nothing new, but decision makers might have to keep these observations in mind when evaluating industry positions.

## Appendix

### Formal presentation of model, proofs

#### A.1 Basic assumptions

There are four actors: a political entrepreneur,  $E$ , and three lobbyists:  $SME$ ,  $MNC$ , and  $SHI$ . As a general symbol for the lobbyists, I use  $l$ . Each lobbyist has an ideal policy outcome in a two-dimensional policy space,  $i_l$ . Also, each lobbyist has a lobbying budget,  $b_l$ . The game sequence:

1.  $E$  selects an association policy,  $c$ , and selective incentives,  $s$ .
2.  $SME$  and  $MNC$  split their budget such that  $\hat{b}_l$  supports  $c$  and  $b_l - \hat{b}_l$  supports  $i_l$ . By assumption,  $\hat{b}_{SHI} = 0$ .
3. One of the supported proposals becomes law:  $o \in \{i_l, c\}$  (where  $o$  stands for “outcome”).

The level of selective incentives that  $l$  receives,  $s_l$ , is some function of  $\hat{b}_l$  such that  $s_l(\hat{b}_l = 0) = 0$ .

Policy  $i_l$  becomes law with probability  $p(i_l) = \frac{b_l - \hat{b}_l}{\sum_l b_l}$ , and  $c$  becomes law with probability

$p(c) = \frac{\sum_l \hat{b}_l}{\sum_l b_l}$ . The utilities are as follows:

$$u_e = f(\hat{b}_{MNC}, \hat{b}_{SME}) \quad (10)$$

with  $\frac{\partial u_e}{\partial \hat{b}_l} > 0$ .

$$u_l = -p(i_{SME})\|i_l - i_{SME}\|_l - p(i_{MNC})\|i_l - i_{MNC}\|_l - p(c)\|i_l - c\|_l - p(i_{SHI})\|i_l - i_{SHI}\|_l + s_l(\hat{b}_l). \quad (11)$$

Policy preferences are based on negative Euclidean distances;  $l$ 's policy benefit from outcome  $o$  is

$$-\|i_l - o\|_l = -\sqrt{\alpha_{l,x}(i_{l,x} - o_x)^2 + \alpha_{l,y}(i_{l,y} - o_y)^2}, \quad (12)$$

where  $x$  and  $y$  refer to the two dimensions of the policy space and  $\alpha_{l,x}$  and  $\alpha_{l,y}$  are weights that  $l$  attaches to the two policy dimensions.

## A.2 Constant $c$

**Proposition 1** If  $s = 0$  and  $c = \{m, n\}$ , where  $m$  and  $n$  are two constants, then  $\hat{b}_l = 0$  for all  $l$ .

**Proof** For all  $l$ ,  $\|i_l - c\|_l > \|i_l - i_l\|_l = 0$ . Since  $p(c) = \frac{\sum_l \hat{b}_l}{\sum_l b_l}$ ,  $\frac{\partial u_i}{\partial \hat{b}_i} < 0$  for all  $i \in l$ .

**Lemma 1** Assume  $s = 0$ . If  $\frac{\alpha_{SME,x}}{\alpha_{SME,y}} \neq \frac{\alpha_{MNC,x}}{\alpha_{MNC,y}}$ , then there is a  $\tilde{c}$  such that  $u_l(\hat{b}_l = b_l | \hat{b}_k = b_k) > u_l(\hat{b}_l = 0 | \hat{b}_k = 0)$  for all  $l, k \in \{SME, MNC\}$ ,

**Proof**  $u_l(\hat{b}_l = b_l | \hat{b}_k = b_k) = u_l(\hat{b}_l = 0 | \hat{b}_k = 0)$ , if  $s = 0$ , if

$$\hat{c} = \left( \frac{b_{SME}}{b_{SME} + b_{MNC}} i_{SME,x} + \frac{b_{MNC}}{b_{SME} + b_{MNC}} i_{MNC,x}, \frac{b_{SME}}{b_{SME} + b_{MNC}} i_{SME,y} + \frac{b_{MNC}}{b_{SME} + b_{MNC}} i_{MNC,y} \right) \quad (13)$$

(compare page 18). The question is if there are any points  $\tilde{c}$  such that

$$u_l(\hat{b}_l = b_l | \tilde{c}, \hat{b}_k = b_k) > u_l(\hat{b}_l = b_l | \hat{c}, \hat{b}_k = b_k) \forall l, k. \quad (14)$$

Since the probability of  $i_{SHI}$  is a constant, equation 14 reduces to

$$-\|i_l - \tilde{c}\|_l > -\|i_l - \hat{c}\|_l, \forall l. \quad (15)$$

Note that  $\|i_l - \hat{c}\|_l$  describes a strictly convex preference set, call it  $P_l(\hat{c})$ , such that  $l$  strictly prefers all points  $c'$  inside this set, or, equivalently, for which  $\|i_l - c'\|_l < \|i_l - \hat{c}\|_l$ . Similarly, we can define  $P_k(\hat{c})$ . If  $P_l(\hat{c}) \cap P_k(\hat{c}) \neq \emptyset$ , then both  $l$  and  $k$  prefer any  $\tilde{c} \in P_l(\hat{c}) \cap P_k(\hat{c})$  to  $\hat{c}$ .

$$P_l(\hat{c}) \cap P_k(\hat{c}) \neq \emptyset \text{ if and only if } \left. \frac{\partial \|i_l - c\|_l}{\partial c_x} \right|_{\hat{c}} \neq \left. \frac{\partial \|i_k - c\|_k}{\partial c_x} \right|_{\hat{c}}. \quad (16)$$

Without loss of generality, assume that  $i_{SME,x} < i_{MNC,x}$  and  $i_{SME,y} < i_{MNC,y}$ . Then it is easy to check that

$$\hat{c} = \{\lambda i_{SME,x} + (1-\lambda) i_{MNC,x}, \lambda i_{SME,y} + (1-\lambda) i_{MNC,y}\}, \quad (17)$$

with  $\lambda = \frac{b_{SME}}{b_{SME} + b_{MNC}}$ , makes  $SME$  and  $MNC$  indifferent between  $\hat{b}_l = b_l$  and  $\hat{b}_l = 0$ , assuming  $s = 0$ .

To simplify notation, say that

$$b_l = \sqrt{\alpha_{l,x} (i_{l,x} - \hat{c}_x)^2 + \alpha_{l,y} (i_{l,y} - \hat{c}_y)^2}. \quad (18)$$

Now, by setting  $u_{SME}(\hat{c}) = u_{SME}(c)$  we get

$$c_x = i_{SME,x} + \left[ \frac{b^2_{SME} - \alpha_{SME,y}(c_y - i_{SME,y})^2}{\alpha_{SME,x}} \right]^{1/2} \quad (19)$$

Similarly, setting  $u_{MNC}(\hat{c}) = u_{MNC}(c)$  produces

$$c_x = i_{MNC,x} - \left[ \frac{b^2_{MNC} - \alpha_{MNC,y}(i_{SME,y} - c_y)^2}{\alpha_{MNC,x}} \right]^{1/2}. \quad (20)$$

Taking the first derivatives at  $\hat{c}$ , it is easily checked that the two derivatives are equal if and only if  $\frac{\alpha_{SME,x}}{\alpha_{SME,y}} = \frac{\alpha_{MNC,x}}{\alpha_{MNC,y}}$ .

(21)

**Lemma 2** If  $s = f(\hat{b}_l)$ , then  $\hat{b}_l = b_l$  if

$$\frac{\partial s}{\partial \hat{b}_l} > \frac{1}{b_{SME} + b_{MNC}} \|i_l - \tilde{c}\|, 0 \leq \hat{b}_l \leq b_l \quad (22)$$

where  $\tilde{c}$  is the common policy proposal.

**Proof**  $\hat{b}_l = b_l$  if  $\frac{\partial u_l}{\partial \hat{b}_l} > 0$  for all  $\hat{b}_l$ . It is easy to check that the lemma follows.

### A.3 $c$ as a function of $\hat{b}_l$

Take the following mechanism to determine  $c$ :

$$c = \begin{cases} i_{SME} & \text{if } \hat{b}_{SME} = b_{SME} \text{ and } \hat{b}_{MNC} = 0 \\ i_{MNC} & \text{if } \hat{b}_{MNC} = b_{MNC} \text{ and } \hat{b}_{SME} = 0 \\ \tilde{c} & \text{if } \hat{b}_{MNC} = b_{MNC} \text{ and } \hat{b}_{SME} = b_{SME} \\ k & \text{if } \hat{b}_{MNC} = 0 \text{ and } b_{SME} = 0 \end{cases} \quad (23)$$

The last case is irrelevant because the probability of  $c=k$  becoming policy is zero.

**Proposition 2** Under the mechanism specified in equation 23, there is always a  $\tilde{c}$  such that  $u_l(\hat{b}_l = b_l) = u_l(\hat{b}_l = 0)$  for  $l \in \{MNC, SME\}$ , as long as  $s = 0$ . If  $\frac{\alpha_{SME,y}}{\alpha_{SME,x}} \neq \frac{\alpha_{MNC,y}}{\alpha_{MNC,x}}$ , there is always a  $\tilde{c}$  such that  $u_l(\hat{b}_l = b_l) > u_l(\hat{b}_l = 0)$  for  $l \in \{MNC, SME\}$ .

**Proof** The game can be summarized in normal form; for notational simplicity, denote the expected utility over the set of possible outcomes,  $u_l(E\{\cdot\})$ , for  $l \in \{MNC, SME\}$ .

		$\hat{b}_{SME}$	
		$b_{SME}$	$0$
$\hat{b}_{MNC}$	$b_{MNC}$	$u_l(E\{\tilde{c}, i_{SHI}\})$	$u_l(E\{i_{SME}, i_{MNC}, i_{SHI}\})$
	$0$	$u_l(E\{i_{SME}, i_{MNC}, i_{SHI}\})$	$u_l(E\{i_{SME}, i_{MNC}, i_{SHI}\})$

Again, without loss of generality assume that  $i_{SME,x} < i_{MNC,x}$  and  $i_{SME,y} < i_{MNC,y}$ . If  $\tilde{c} = \hat{c}$  (compare page 18), it is easy to check that  $u_l(E\{\hat{c}, i_{SHI}\}) = u_l(E\{i_{SME}, i_{MNC}, i_{SHI}\})$ . From Lemma 1, if  $\frac{\alpha_{SME,y}}{\alpha_{SME,x}} \neq \frac{\alpha_{MNC,y}}{\alpha_{MNC,x}}$ ,  $u_l(E\{\tilde{c}, i_{SHI}\}) > u_l(E\{\hat{c}, i_{SHI}\})$ .

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