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The Scientific Advisory Board

The last uncharted instrument of quality control and assurance in academia

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Main Results

Among the numerous instruments of academic quality assurance and development, there is one about which there is **hardly any systematic knowledge:** scientific advisory boards. These are understood here as collegial bodies that (a) provide advisory services for scientific institutions or actors and (b) are composed in its majority of academics. In these advisory boards, **scientists** receive **scientific advice from other scientists on scientific issues**. The scientific system is advising itself. Thus, unlike for example university councils or scientific bodies that advise politics, the scientific advisory boards work according to the **norms of the science system**.

Such advisory boards generally enjoy a positive assessment, but at the same time they are **protected from observation**: On the one hand, there is no systematic knowledge or empirical data on whether the advisory boards fulfill expectations or have other productive effects. On the other hand, the self-counseling of science lies outside of discussions that may give room to problematizations. In this respect, scientific advisory boards within the scientific community are **doubly unique**:

They are the only remaining quality assurance instrument in science that is considered to function without doubt. And they are the only form of consultation that does not generate any occasion to check the actual level of functional fulfillment.

It is thus an **instrument of inquiry that is not subject to inquiry.** At the same time, advisory boards incur costs at the level of the organizations and the individuals involved. For this reason, a systematic investigation was undertaken for the first time.

Distribution and Numbers

Science advising itself corresponds to the classical idea of quality assurance and development of science through self-control. Scientific advisory boards – in their form as 'critical friends' and as peers - thus correspond to **the logic of its reference system**. The perpetuation of the scientific advisory board system in this logic is isomorphic: Since advisory boards have been successfully established as organizational forms in some scientific contexts, e.g. in journals, the form is adapted to other environments whe demand for quality assurance and/or development increases.

The prevalence of scientific advisory boards varies greatly depending on segment: between zero and 100 percent (where mandatory). An **estimate for the entire German science system** shows:

- 1,184 advisory boards are active at scientific journals,
- 463 in research projects (by the DFG, federally funded project research, research-funding foundations, and the long-term projects of the Union of the German Academies of Sciences and Humanities),
- 292 advisory boards at non-university research institutions (Max Planck, Helmholtz, Leibniz and Fraunhofer, research institutes of the *Länder*, and research museums, collections and libraries),

- 163 at university-based institutes and centers,
- 157 as juries for scientific awards,
- 139 for degree programs,
- 112 advising professional societies
- as well as 13 in federal or state grant programs.

Tentatively, it can be estimated that about **2.500 scientific advisory boards** are active in the German science system. There are areas with high numbers of boards, and others with low numbers.

The first group includes professional societies (23% with scientific advisory boards), scientific journals with 46% board saturation, and non-university research institutions, where scientific advisory boards hover between 40% and 100%, with the exception of the institutes of the Fraunhofer Society. Likewise, 100 percent of the long-term research projects of the Union of German Academies of Sciences and Humanities as well as scientific prizes are supported by advisory boards. Overall, this group on average has 50 percent that are supported by a scientific advisory board.

In comparison, there is a lower prevalence of scientific councils in degree programs and federally funded research projects (1 % each), in research projects, university institutes, and institutions of the Fraunhofer Society, federal and state funded programs (between three and six percent) and DFG-funded research units (excluding individual funding) with ten percent. On average, this group has a board-saturation rate of two percent.

Two conspicuous features stand out: Both degree programs and institutes of higher education are more closely or more frequently associated with academic teaching than with research, and both are among the units with the lowest prevalence of advisory boards. In contrast, it is primarily research or research-related units that have a high rate of advisory boards. The advisory board system seems thus to be more prevalent in research than in teaching. At the same time, however, advisory boards are also rarely found with research projects (with the exception of the long-term projects of the Akademienunion). The temporary nature of projetcs could play a role here. This is supported by the fact that funding programs, which are also temporary units, have a low density of advisory boards, too. The special case of Fraunhofer institutes – both permanent and research-based – can be explained by the fact that due to the praxis-oriented nature of their research, boards staffed with practitioners are more widespread than scientific advisory boards.

In short, **the closer** a scientific unit is to **research** and, at the same time, the **more permanent** it is, **the more affinity** it **has for advisory boards.** In contrast, scientific advisory boards are rather rare in units that are more teaching-oriented and in those that exist only temporarily.

Advisory Board and Membership Characteristics

Membership characteristics have overarching commonalities: The **typical advisory board member** is a professor, male, older than 40, but has not yet reached retirement age.

The **academic status of** board members is high across all of the analyzed institutions: on average, 81 percent are professors. The analysis of the **age** structure shows that the vast majority of members are active still academically active:

- In all individual surveys, the majority of members (always more than 60 percent) are in the age cohort between 40 and 70.
- For the most part, the proportion of over-seventy-year-olds ranges between three and five percent.

Although **men** with *Habilitation* (second book) dominate the advisory board roster with shares between 58 percent and 68 percent, this is less than the share of **women** among the *habilitated* academics in Germany might suggest. With the exception of scientific journals (with 18% women), female *Habilitation* holders are better represented in all other scientific advisory boards than in the German scientific system as a whole.

The **internationality** varies depending on the function of the advisory board: Journals, most of which are geared towards international audiences, also recruit most of their advisory board members internationally, so that 98 percent of their scientific advisory boards have at least one member not affiliated with a German institution. Institutions such as higher education institutes, where advisory boards must have knowledge of local or national conditions in addition to scientific expertise, recruit more strongly from the German science system.

On average, 61 percent of boards have at least one international member.

Benefits for and Motivations of Board Members

For advisory board members, the benefits of participation vary depending on the type of advisory board. Peer consulting and evaluative activities result in **networking effects**. Ideas can be developed on the basis of suggestions received through advisory board work, or the advisory board members become aware of new ideas through their work. Experiences, e.g. about successful application strategies or emerging topics, are exchanged, which in turn is useful for one's own research work. Furthermore, the **professional ethos** plays an important role and can partially suspend considerations about possible benefits: Peer consultation represents an integral part of a scientist's role.

The **average time spent on an advisory board meeting** is 12.2 hours per member (including travel to and from the meeting) and 19.3 hours for the coordinator of the board. Advisory boards that primarily exist for reputation transfer are characterized by minimal time investment on the part of the board members: Purely decorative journal advisory boards are prominently featured in external communication but are inactive. Juries for academic awards are asked to serve little more than once a year in a very compact time format.

If advisory board members are **dissatisfied** with the work of the advisory board, this is usually due to one or both of two reasons: on the one hand, a **negative time balance,** and on the other hand, the perception of one's work with the advisory board as having **no influence,** which in turn is seen as a penalty for the time spent on advisory board activities. If members of an advisory board gain the impression of ineffectiveness, they usually react by severely restricting or completely refraining from activity, but hardly ever

by formally leaving. Not least because of their professional ethos, they usually remain formally loyal.
In the medium and long term, the commitment of members must be maintained through an **appropriate level of involvement** in development of the advised unit: not too much, in order to avoid overload; but also not too little, in order to avoid the impression of a lack of desire or need for advice.

Systemic Resources
The scientific advisory boards generate **direct and indirect costs**:
Direct costs cover the logistics of board activities and the time invested by their members. Indirect costs are those for the maintenance of the relationship between the advised and the advisors.
The average size of scientific advisory boards varies depending on the advised unit. Our estimate indicates that the approximately 2.500 advisory boards have a total of around **40.500 advisory board memberships.** However, this is not identical with the number of people serving on advisory boards, as there are often multiple memberships . On average, each person on an advisory board at a German institution holds **2.8 advisory board memberships**. This means that approximately 14.500 scientists are active in scientific advisory board work.
68 percent of all advisory board members are scientists working at foreign institutions; excluding the advisory boards of journals, the figure is 33 percent. This means that approximately **13.200 advisory board members** are employed at German institutions.

If both the foreign members are not taken into account (since their individual expenses are not incurred in the German science system) and the advisory board members without professorships, and if at the same time the multiple memberships of individual persons are included (3.0 for journal advisory boards and 2.4 for other advisory boards), this means that **15 percent** of the 25.643 university professors working in Germany are actively involved in the scientific advisory board system (excluding journal advisory boards the figure is 8.5 percent): 3.855 in total and 2.245 if journal advisory boards are not taken into account. Advisory boards of **scientific journals** are a special case in many respects. Here it must be assumed that only **about half of the them are actually active.**
Taking this speciality into account, a total of **162.400 hours of working time are** spent per year by German scientists on scientific advisory boards.
If this time is converted into financial equivalents (personnel salaries), the time invested by the German members of advisory boards corresponds to approximately **9,3 million euros** per year. The direct financial expenditure for holding meetings of all boards amounts to **17,7 million Euro** per year. The scientific advisory councils thus generate costs of around **27 million euros**.

Data sheet: Scientific advisory boards in the German science system

Number and distribution of scientific advisory boards

Quantity	Research projects, auFE, university institutes/centers, award juries, degree programs, professional societies, research funding programs.	1.323	Total: around 2.500
	Scientific journals	1.184	

Grouping according to shares of Scientific Advisory Boards	High diffusion	auFE, professional societies, journals, Academies Union long-term projects, award juries: ∅ 50 %
	Low diffusion	Funding programs (federal/state), research projects, auFE: FhG, university institutes, degree programs: ∅ 2 %

Membership Characteristics

Age structure	40-70 years: more than 60 % each		Older than 70: 3-5 %
Gender ratio (members with *Habilitation*)	Men:	58 - 68 %	Special case of journals: 82 % men : 18 % women
	Women:	32 - 42 %	
Internationality	≥ one international member	Average of all advisory boards:	61 %
		Journal advisory boards:	98 %
	Total share of international members	all advisory boards:	68 %
		without journals:	33%

Demand on personnel resources

Number of members per advisory board	research programs/ professional societies: ∅ 10-20	journals: ∅ 25	All others: ∅ 5-10

Advisory Board Members	Number of memberships nationwide (incl. international members)	all advisory boards: 40.500	without journals: 10.980
	Number of memberships in active Advisory boards	all advisory boards: 25.780	without journals: 10.980
	Multiple memberships	Journals: 3	without journals: 2,4
	Academics active in advisory boards	All advisory boards: 14.442	without journals: 4.575
	of which are affiliated with German institutions	All advisory boards: 5.005	excluding journals: 3.057

	of which are university professors working at German institutions	All advisory boards: 3,855	without magazines: 2.245
	Proportion of German university professors as a proportion of the overall professorate	all advisory boards: 15	excluding journals: 8,5
Costs of scientific advisory boards per year			
Cost of hours worked (Advisory Board members working at German facilities)		9,3 million euros	
Property costs (for travel and supplies)		17,7 million euros	
Total		**27 million euros**	

Those costs can be compared to the costs incurred by professorships: The 27 million euros **correspond to 241 full-time professorships.** Since there are around 100 universities in Germany, this would correspond to about 2,5 professorships per university.

Functions, Effects and Benefits
The aforementioned costs have to be compared to the boards' benefits. Three **main functions of** scientific advisory boards can be identified: They are

- 'critical friends' in an advisory capacity,
- used for performance evaluation or/and
- maintained for reputational purposes.

In addition, the functions of scientific advisory boards go beyond quality assurance insofar as they also represent a kind of '**strategic quality enhancement reserve**'. Science operates in a contingent social environment, and this environment formulates different and sometimes contradictory expectations towards science. In this situation, advisory boards offer the possibility to (re)act flexibly to external requirements.

In addition, various latent advisory board functions can be identified, especially at the **individual member's level**. These include the possibility of exchanging information on research topics and follow-up communication on (current or future) research and career optimization.
Differences in the organizational form of advisory boards are coupled with the institution that maintains them. A distinction can be made between **scientific organizations** and **organized science:**

- Scientific organizations form the organizational framework for scientific activities, and the actors involved regard them as central institutions for their scientific work.
- Organized science, on the other hand, comprises institutions that primarily serve communication within the relevant community and reputation transfer.

If we chart the advisory boards according to their adherence to institutions and their functions, we can outline **four types of advisory boards:**

- the board at scientific organizations (e.g. at a research institute), which functionally orients towards serving scientific truth criteria;

- the likewise truth-oriented board at units of organized science (e.g., at professional societies),
- the reputation-oriented advisory board at scientific organizations (e.g. for research projects)
- the reputation-oriented advisory board in institutions of the organized science community (e.g. for science prizes or awards).

While advisory boards at scientific organizations almost always inhabit an external position vis-à-vis the advised institution, boards at institutions of organized science are often directly involved with these.
The main functions of boards, the expectations of the advised as well as reasons for the perception of their success are:

- **Cultural acceptance** and perceived fulfillment of functions: Scientific advisory boards are a form of quality assurance and development that is widely accepted in the scientific community. An advisory board can significantly strengthen the legitimacy of a scientific unit with comparatively manageable costs. Advisory boards are also appreciated by external stakeholders. From their point of view, the existence of a board relieves them of the burden of control because where an advisory board exists, additional quality checks are not needed or are needed less frequently. This is mainly based on a perceived fulfilment of the board’s function: systematic knowledge about the work of scientific advisory boards or even their impact is scarcely available, yet projected.
- **Direct quality assurance and development**: Quality development takes place as a review process among colleagues who tend to be of equal rank, with the members of the advisory board acting as critical friends. Boards that (also) evaluate members of the scientific community provide expertise that may be relevant for decisions to the disadvantage of the advised institution; however, great care is taken to separate advice (by the board) from possible sanctions (by the addressee of the evaluation).
- **Indirect quality assurance and development**: Indirectly, the board’s activities contribute to quality development by generating signals of scientific expertise for non-specialists – not least through the reputation of the board members. Thus, the board helps to secure support for the development of the advised institution. The board’s reputation is only used situationally for quality assurance.
- **Absorption of organizational uncertainty**: The tendency to adopt successful instruments to absorp uncertainty that penetrates an organization due to demands from its environment increases if those uncertainties grow. Organizations absorb such uncertainties by making decisions that exclude alternative possibilities thereby creating security for themselves, which they then rarely question, leading to a certain inertia. The advisory board as part of a complex structure of quality instruments can be used to reject external decision-making impositions.

- **Irritation versus uncertainty absorption**: On the one hand, advisory boards generate irritation by drawing attention to possibilities that have not been taken into account by previous decisions of the organization. In this way, they generate a willingness to change within the organization. This is countered, on the other hand, by the task of helping to process new events that are perceived by the organization itself in its environment. This advice from the advisory board does not serve to make the organization more sensitive, but rather to absorb uncertainty, e.g. by making recommendations that can be accepted or neglected.
- **Absorption of uncertainty for funders**: The goal of absorbing uncertainty through consulting work can also be seen with the funders. They perceive uncertainty with regard to their competence in assessing the scientific quality or (practical) relevance of research projects, which is to be contained by the advisory service. By focusing on both the organization and the respective li organizational environment, advisory boards can perform this dual function.
- **Safeguarding change** and mitigating the impetus for change: Boards can serve to promote as well as to prevent organizational change. In the first case, an advisory board emphasizes the significance of perceived irritations (e.g., emerging issues, new methods, changing expectations) and provides a translation into organizational logics through its position as a critical friend. This makes it easier for members of the organization to productively introduce irritations into existing contexts and to modify them accordingly. However, the distance of the advisory board from the organization can also have a negative impact if general trends are recommended despite the lack of concrete benefit for the specific organization. Yet, as the advisory boards do not have decision-making power, their vote can ultimately also be rejected. If the organization aims to prevent change, an advisory board can act as an ally, relieving the organization of the burden of conflict by combining professional and symbolical authority: Irritations from the environment (e.g., from political actors), which both the organization and the advisory board perceive as inappropriate, are skillfully rejected by the board in such a way that this refusal does not reflect negatively on the organization.

Critical Points and Dysfunctionalities
Various critical points and dysfunctionalities were identified:

- **Uncertain role in tandem with other instruments of quality assurance**: Scientific advisory boards represent only one of various scientific bodies for quality assurance or development. Their interaction with other bodies, especially with the advisory boards staffed mainly by practitioners, can cause frictions in some cases.
- **Conflicts of interest**: The pool of potential board members at the highest reputational levels (who are

the ones usually requested) is limited, even with the ongoing internationalization of recruitment. Therefore, there may be an accumulation of posts among advisory board members. Here, the typical scientific tension between cooperation and competition can come into play: The discussion with peers opens up not only the possibility of benefiting from expertise on a reciprocal level, but also the opportunity to develop ideas in competition with others.

- **The chair person**: The person chairing the advisory board may assume a central function because he or she has the strongest connection to the organization being advised or because he or she is able to define his or her own role and thus the direction of the entire board due to a lack of fixed procedural mechanisms. Conversely, this means that the (temporary) loss or inactivity of the chairperson can result in a (temporary) dysfunctionality of the whole board.
- **Loss of critical distance**: A long membership period can lead to a decreasing distance from the institution being advised. *Critical friends* can thus become *best friends.* This dysfunctionality can be minimized by limiting terms.
- **Reactions to work overload**: Relevant is the proportion of time invested in advisory boards by their members, as this work time cannot be invested directly in other scientific work. It can be assumed that some of the advisory board activities also serve to improve or prepare future scientific work, for example through direct interaction and networking, information on future research projects, innovative approaches, etc. Nevertheless, advisory board work consumes time during which other scientific (i.e. career-advancing) activities are suspended. This time investment is particularly high for highly reputable members of the science system, as they often serve on several boards.

Whether the invested time could be reduced (and thus capacities for teaching and research could be freed) by limiting requirements for quality assurance is a fundamental question in the German advisory board system – and beyond. At the very least, one could ask whether functional equivalents exist that place less strain on the resources of the science system. However, this question can also be asked the other way around: There is a strong belief among bodies of science administration and politics that the existence of a reputable advisory council guarantees the quality development of an institution. Since the science system is well supplied with mandatory reporting and auditing procedures, the appointment of a scientific advisory board may be an elegant and clever technique to protect scientific institutions from an additional increase in quality-controlling bureaucracy.
If the two opposing arguments are to be brought together, the conclusion is that a fundamental inventory of the extensive quality assurance and development instruments in the German science system is needed. Such a review should not only look at performance aspects, but also at the costs incurred.

For the time being, a proliferation of scientific advisory boards seems likely due to their diversity and adaptability, but also due to isomorphic efforts to absorb uncertainty by organizations. If the quality of the boards's work can be ensured will largely be determined by membership recruitment and appropriate activation of members. In some contexts, this will presumably require a reduction in the amount of time invested in board activities.