DOCTORAL STUDIES ORGANISATION

BASIC PRINCIPLES OF ORGANIZATION AND MANAGEMENT OF DOCTORAL STUDIES

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FACTORS INFLUENCING NATIONAL ACADEMIC RESEARCH PERFORMANCE

- Report: *Links between research policy and national academic performance*
- Science systems can be viewed as complex **eco-systems** with a number of vital balances that must be maintained and continually calibrated in order to secure stable, long term high performance. A national science system can be seen as a configuration of a number of interdependent elements which reinforce each other positively or negatively. A well balanced system has positive feedback mechanisms between its parts, while the opposite is present if central imbalances are allowed to persist.

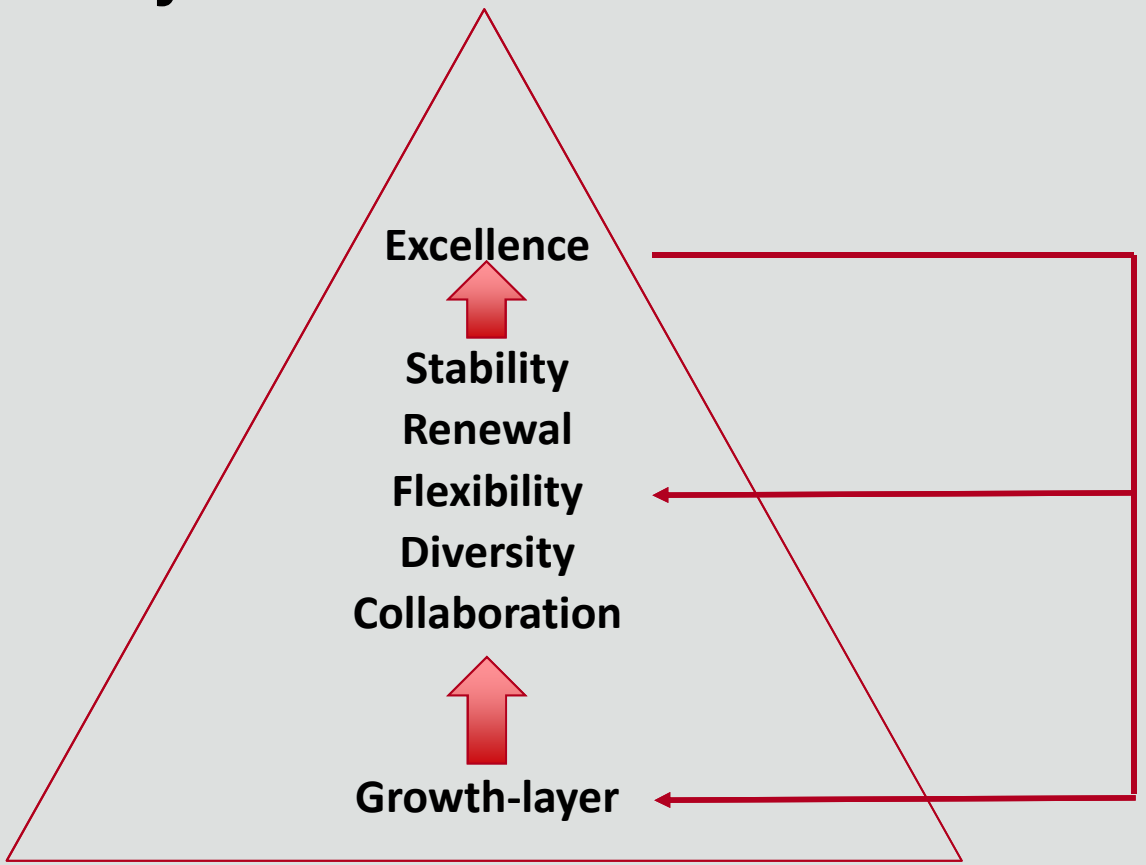
FACTORS INFLUENCING NATIONAL ACADEMIC RESEARCH PERFORMANCE

High performing national research systems succeed in balancing:

a diverse growth layer	⟷	room for excellence
stability	⟷	change
diversity	⟷	concentration
steering	⟷	protected space
renewal	⟷	continuity
flexibility	⟷	strong research culture

FACTORS INFLUENCING NATIONAL ACADEMIC RESEARCH PERFORMANCE

The Science eco-system



FACTORS INFLUENCING NATIONAL ACADEMIC RESEARCH PERFORMANCE

Following factors play important roles in securing these vital system-balances:

1. Institutional funding
2. Project funding
3. Excellence funding
4. **PhD education**
5. University governance
6. Internationalization

(7. Cross sectorial collaboration)

FACTORS INFLUENCING NATIONAL ACADEMIC RESEARCH PERFORMANCE

Institutional funding:

- Secures infra-structure, long-term stability, flexibility, diversity and a strong growth layer.
- If the institutional funding lacks incentives for individuals and institutions to strive for excellence, this type of funding may lead to stagnation if the research culture is weak.

Project funding:

- Draw out the best ideas and encourage research collaboration.
- Balance between large grants to support the top of the system (concentration of resources) and smaller grants draw the balance towards the growth layer and increased diversity of the system (dilution of resources).
- Balance between funding for curiosity-driven research vs. funding for more strategic or applied research.
- Long time horizons increase flexibility, protected space and explorative research, while shorter horizons may lead to more ‘safe’ research.
- A high share of project funding creates large administrative costs and potential unintended effects.

FACTORS INFLUENCING NATIONAL ACADEMIC RESEARCH PERFORMANCE

Excellence funding:

- Stimulating a small number of excellent performers will have positive effects on the vitality, attractiveness, and productivity of the whole science system.
- Combine the benefits of institutional and project funding, but may also have unintended effects if they become too dominant (excessive concentration of funding, reduced diversity and a more vulnerable growth layer).

PhD education:

- Socializes PhD candidates to research.
- Reproduces faculty = the primary source of renewal of the scientific community = lies at the core of any nation's research capacity.
- The volume must be calibrated carefully as it may harm the balance between continuity and renewal in the staff composition.

FACTORS INFLUENCING NATIONAL ACADEMIC RESEARCH PERFORMANCE

University Governance:

- The *external* university governance defines the autonomy of the research institutions and can limit or increase the room to maneuver at the Higher Education Institutes (HEI).
- The *internal* university governance at the central level may secure healthy system balances within the institutions (incentive systems), but can at the same time create risks of increased bureaucratization, standardization and allow adaptive organizational forms to develop.

FACTORS INFLUENCING NATIONAL ACADEMIC RESEARCH PERFORMANCE

Internationalization:

- Plays an important role in explaining research performance.
- Is mainly driven by internal scientific dynamics.
- Lies at the core of strong research cultures (within the hard sciences in particular; increased competition for positions, access to additional funding).
- May threat the stability and continuity of science systems which serve other, more nationally oriented, functions than pure academic research (education and knowledge exchange).

Cross sectoral collaboration:

- Public-private research collaborations may lead to high citation impact for individual publications, but it is unlikely to be a main driver of aggregated national performance.

PHD EDUCATION AT THE UNIVERSITY LEVEL

PhD education – characteristics

- Is the *solar plexus* of the activities within a full university
- Integrate research with education at the Higher Education Institute (HEI) in question
- Reproduces faculty staff
- Regenerates the scientific community
- Provides experts to the society at large

PHD EDUCATION AT THE UNIVERSITY LEVEL

PhD education – balance points and anchoring

- Embedded in institutional strategies and policies
- Balance between post-doctoral and pre-doctoral research
- Achieving critical mass in all its programmes
- Balance between different sources of finances; internal and external (funding bodies)
- Connection between different education levels at the HEI itself, or its partner(s), providing progression
- Supervision capacity and other support structures
- Retention within the academia; employability outside the academia

PHD EDUCATION IN THE RESEARCH ECO-SYSTEM

CONCLUSION

PhD education

- is an integral part of the research eco-system
- stands for renewal in the research system
- has to be strategically calibrated for critical mass and balanced with post doctoral research for each subject area
- delivers experts to the academia and to the society at large according to their demands
- is important in the activities of all full-blown universities