

Managing research under constraints



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Outline of the presentation

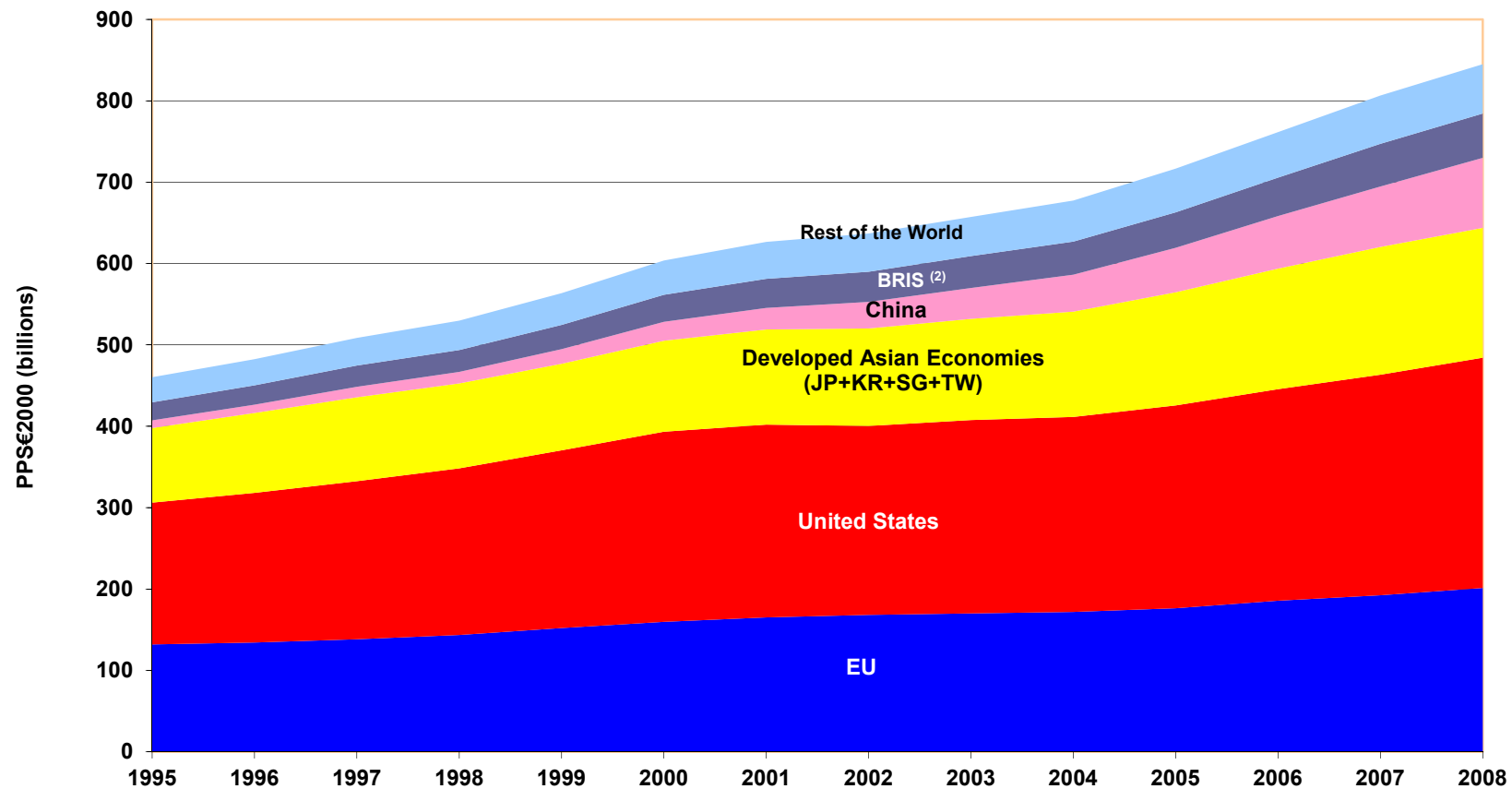
1. Relevance of tracking doctorate holders careers
2. Many audiences and stakeholders, various solutions
3. Country differences and diverse strategic organizational actorhood
4. Organizational dilemmas
5. Some issues linking careers and research management of HHRR
6. Managing resource under constraints.

1. Relevance of tracking doctorate holders careers

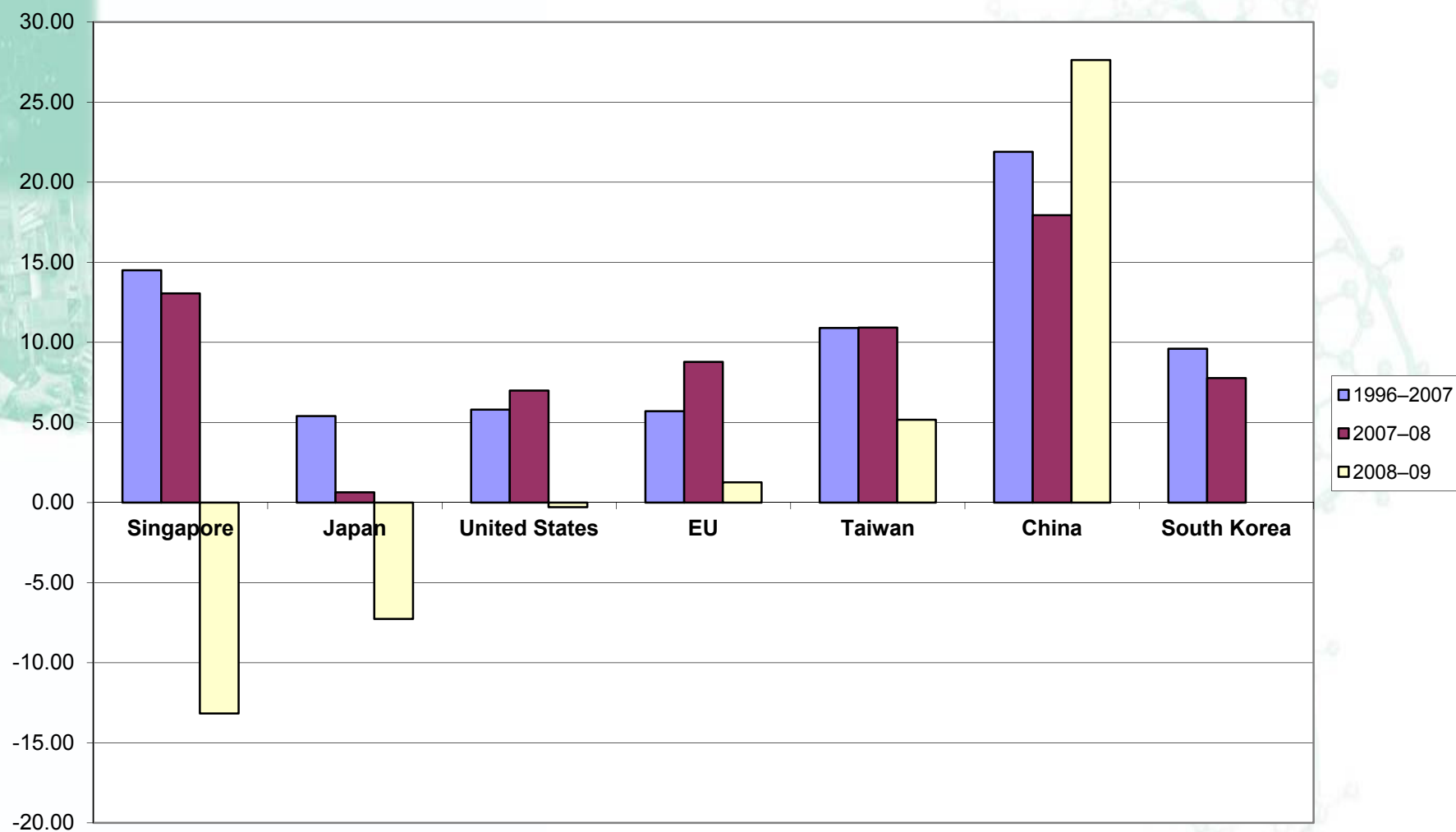
- In the context of the knowledge economy one dimension is R&D investments, but also investment in education (higher education).
- The increase of the research labor force is a relevant factor, but also the increase of the supply of highly-qualified people.

Evolution of World GERD in real terms (PPS€ at 2000 prices and exchange rates), 1995-2008

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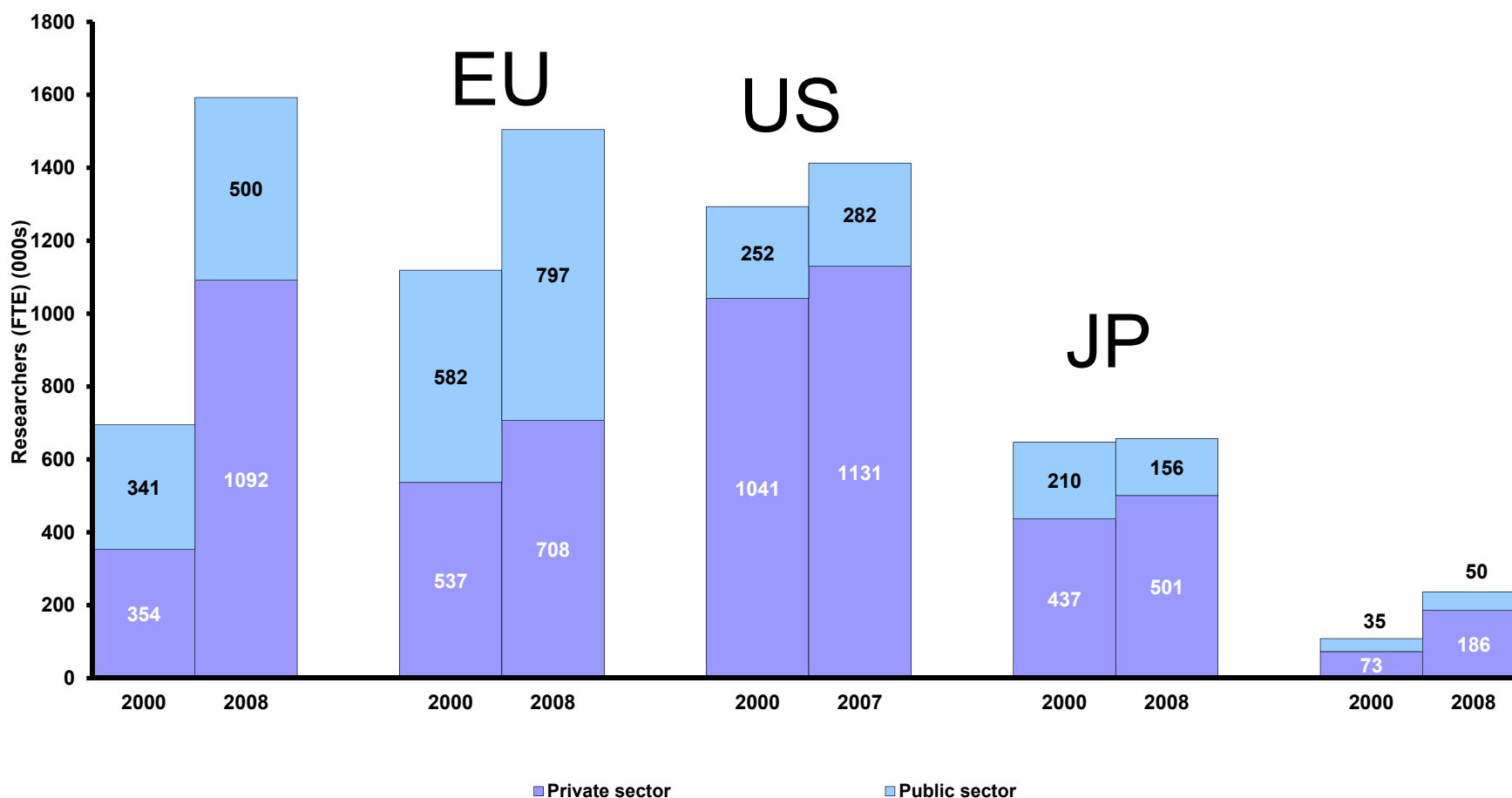


Annual growth rates GERD



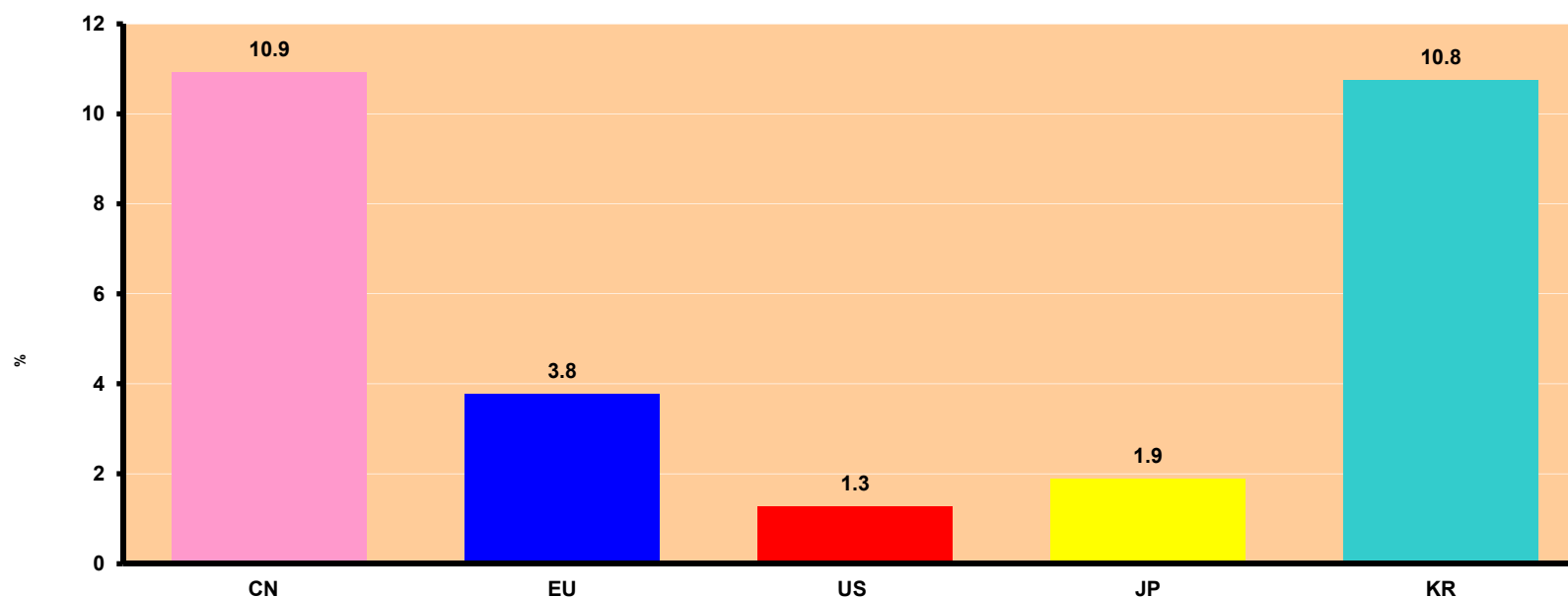
Researchers (FTE) broken down by public and private sector, 2000 and 2008 CN, EU, US, JP, KR

Researchers (FTE) broken down by public and private sector, 2000 and 2008 ⁽¹⁾



Total Researchers (FTE) - average annual growth (%), 2000-2008

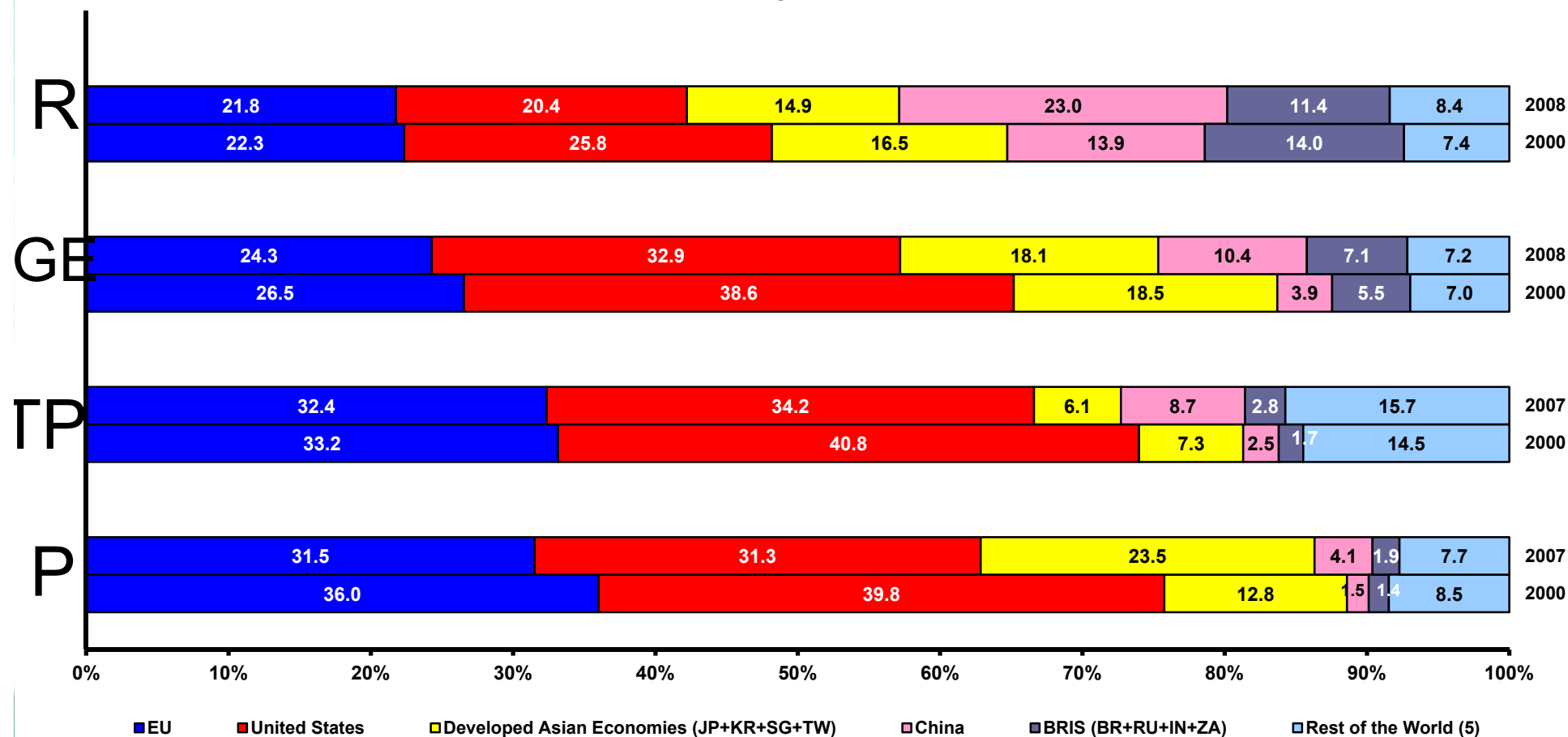
Total Researchers (FTE) - average annual growth (%), 2000-2008 ⁽²⁾



Participation in global R&D - % shares

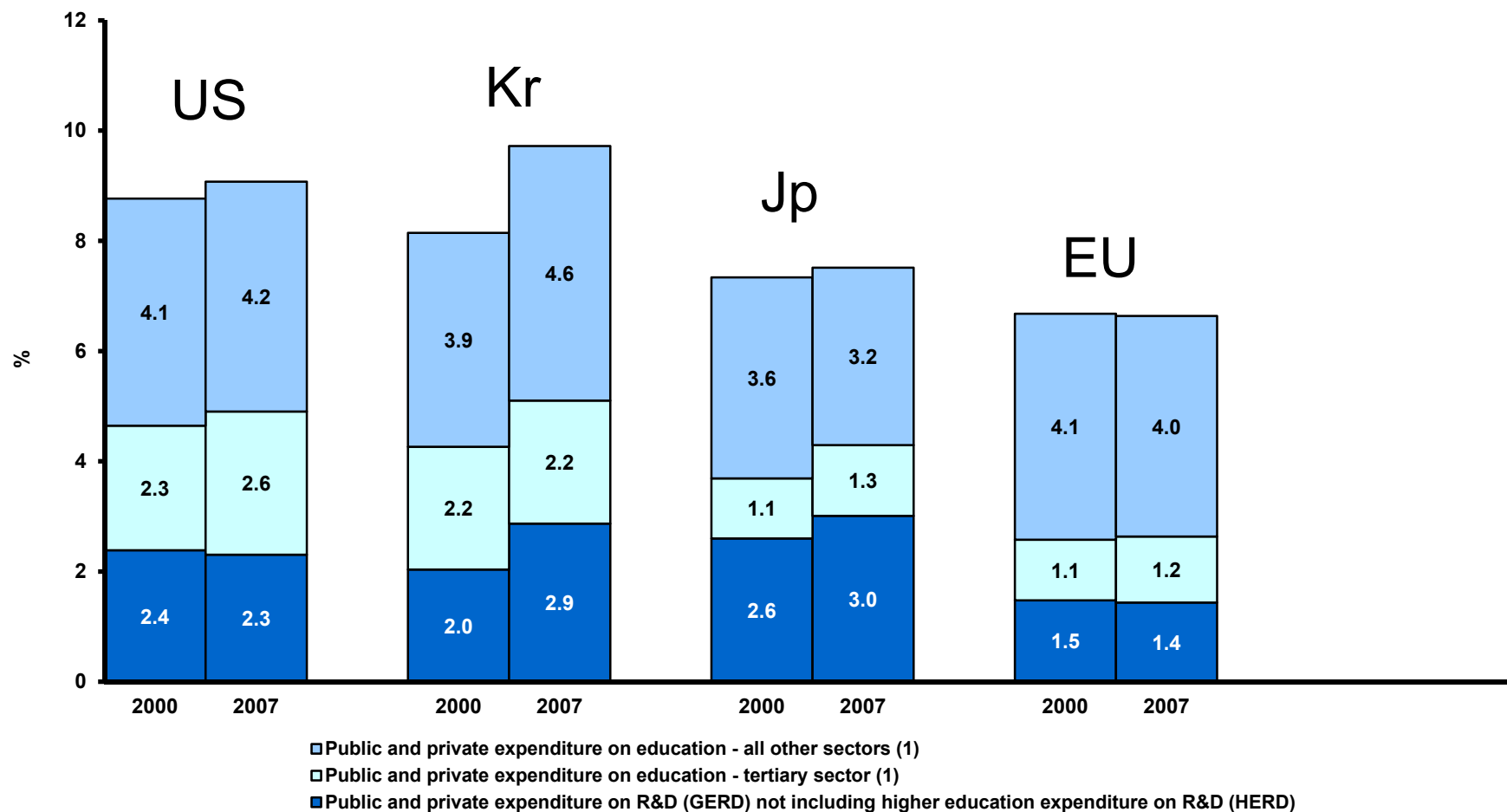
Researchers, GERD, Top Pub, Patents

Participation in global R&D - % shares



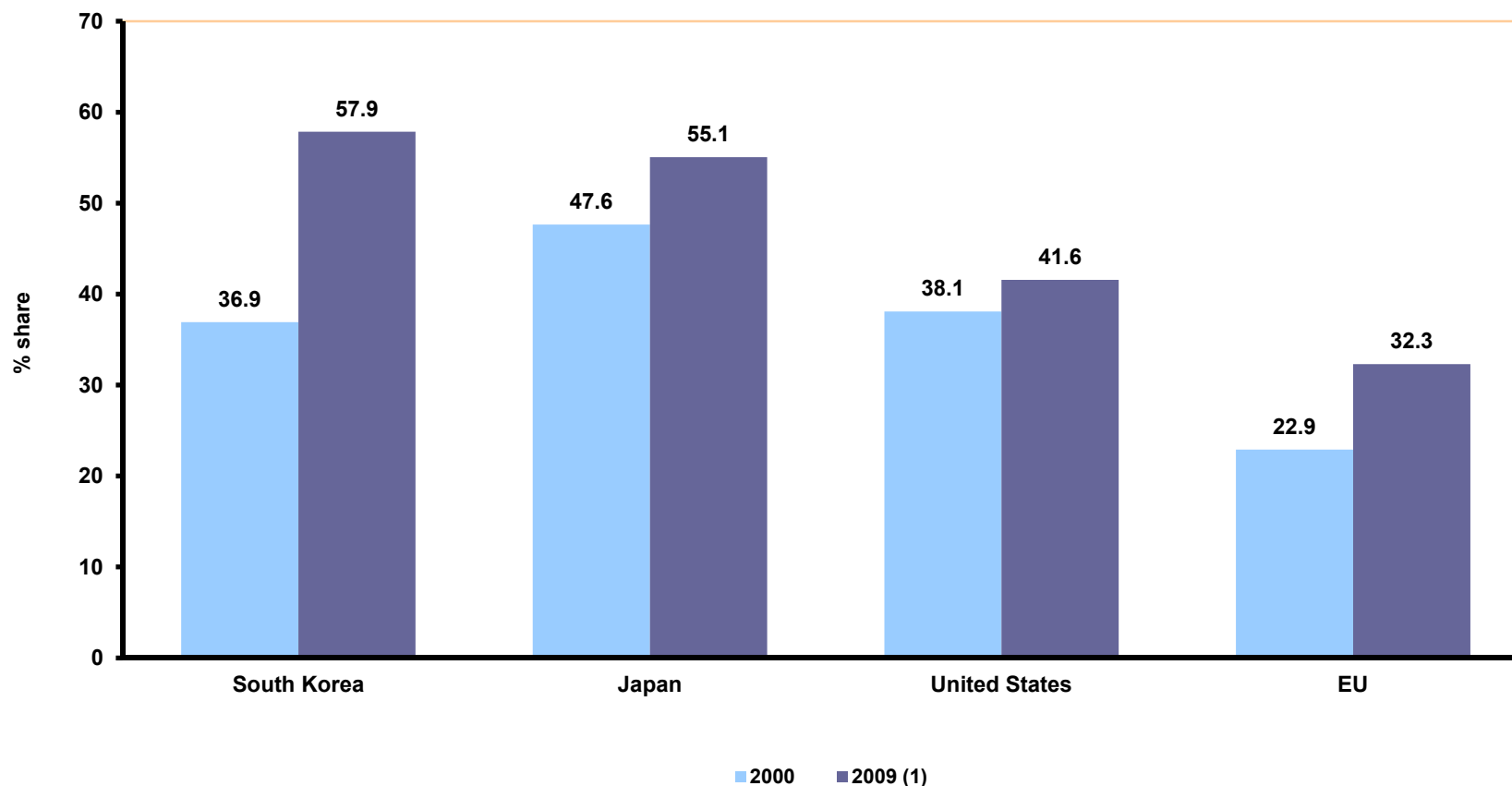
Investment in R&D and education as % of GDP, 2000 and 2007, US, Kr, Jp, EU

Investment in R&D and education as % of GDP, 2000 and 2007

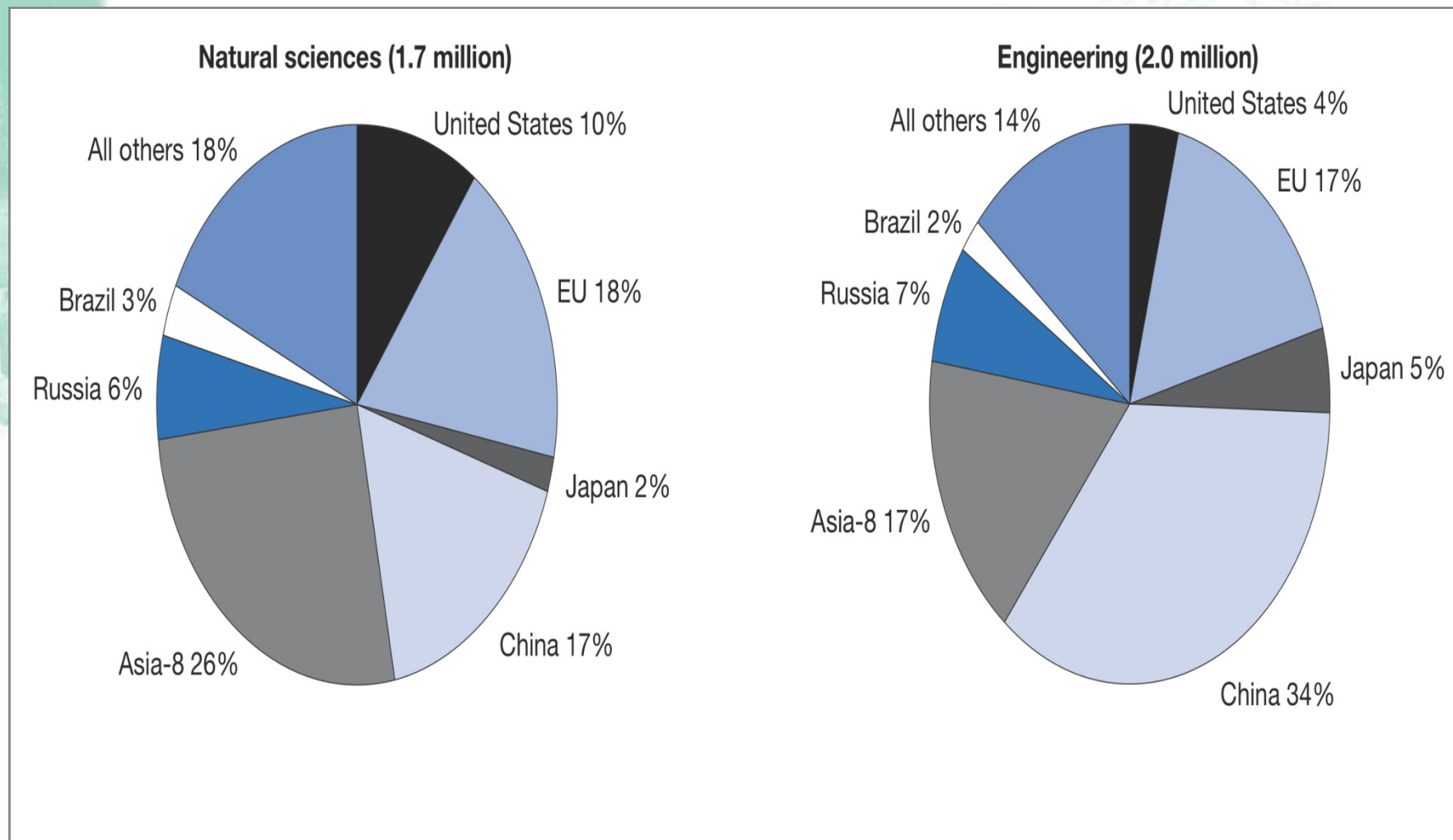


Share of population aged 25-34 having completed tertiary education, 2000 and 2009

Share of population aged 25-34 having completed tertiary education, 2000 and 2009 ⁽¹⁾



First university degrees in natural sciences and engineering, by selected region/country: 2008



1. Some historical facts on Doctorate

- In 1940, US was producing 186K graduates, 26K Masters and 3.200 PhDs.
- In the 50s, with the growth of fellowships, graduate education exploded.
- More than 50 years ago the US NSF started the collection of data on Doctorates Survey of Earned Doctorates (1957-58) and latter on tracking their careers (Survey of Doctorate recipients (1973)
- But we still have very little comparable data on the Doctorate holders supply and demand in the world economy

1. Some emerging policy issues

- Claims of shortage and overproduction,
- Basic knowledge is a public good, society should make a decision of the appropriate level of public investments, considering social return.
- Length of time in training and skills acquired
- Earning and returns to investments in education
- Matching areas,
- Transferability of skills,
- International and job to job mobility,
- Etc....

2. Different audiences and stakeholders

- In this context, doctorate holders and researchers' career tracking and monitoring have become important in order to inform decisions by different stakeholders and the public.
 - **Individuals** making decisions about entry in the labor market versus enrolling in a PhD program,...
 - **Governments and systemic stakeholders** concerned about supply and demand, the skills the economy need or the appropriate level of government support,...
 - **Institutions and organizations** managing their HHRR and competing for talent, ...

2.and various solutions

- And to provide support for the management of the research activities. E.g. the Spanish, Brazilian, and other countries initiatives for “Normalized Curriculum Vitae” (CVN):
 - CVN: Standardize CV to exchange research information of individual among research information systems (web based formats)

3. Global competition, nationally shaped

- PRI & Universities worldwide **compete for reputation** in local and global markets
- The attraction of talent has become a key dimension in this competition
- Trends for performance-based funding models incentivise the selection of the best possible academics
- However, diverse governance structures of universities, and resources, influence the choice of ways in which this can be achieved.
- Structural and Organizational features are essential to understand the diverse effects that the same variables might have.

3. Universities as organisations

- Universities and PRI can be characterized as “**professional bureaucracies**” (also “organized anarchies” and “political coalitions”), **as decentralized forms of organization which give a high degree of autonomy to individual professionals**, who concentrate power and status (Management has to relay).
- But, heterogeneity among countries is the rule regarding universities’ autonomy, funding allocation, discretion in the use of resources, employment relationships, etc. having very **different capabilities as strategic actors**.
- In some countries where universities are public and **compete very little among themselves**.
- Public policy (regulations and funding) is expected to be a key driver of changes and **more competitive funding is a general trend**, but the management of HHRR and the authority structures move slowly.

3. Science systems diversity

- Public Science Systems can be described along two dimensions (Whitley 2008):
 - According to the **centralization of provision of resources and control over scientific employment**, we can distinguish among state delegated and pluralist systems.
 - According to the **level of diversity of funding and competition among actors**, we can distinguish between stable (low competition) and competitive systems
- Different models will show **diverse levels relative authority** of: the state, the funding agencies, the PRO centers, the reputational elites, and the private interests, **then providing very diverse opportunities to the Organizations to act strategically.**

4. Organizational dilemmas

- Universities and research organizations even if there share with other bureaucracies some attributes they have specificities. **The organization of the academic enterprise shapes the academic work.**
- Organizations confront DILEMMAS (Blau 1973)
- The outcome of the dilemmas (in which the interest of various groups conflict) tend to be determined by the distribution of resources and power in the stratification systems.
- **The simple dilemma occurs when the accomplishment of two or more ends depends on the same scarce means, since the more of one end is attained the more of the other must be sacrificed.**

4. Recruitment dilemmas

- Faculty recruitments illustrate the dilemmas. To recruit good students an academic institution must have good faculty... to recruit good faculties.. good salaries.. large better but less attractive
- To recruit and keep good faculty, authority over that appointments should be decentralise (competence to judge candidates), but biases in selection decisions
- Universalistic values, shared by the community. The merit criterion is shared and unites the academic community. But the question is if select the best qualified or those belonging to the in-group: Loyalty to the institution.
- Faculty member with superior qualifications (more involved in research are less committed with their local institutions), but their presence strength their local commitment to the rest.
- **For the institution (in a world with restrictions) is better to hire people with less local links (but superior qualifications) because it contribute to academic standing (but bad for local commitments).**
- But some organizations respond to the dilemma between **mobility and loyalty** by developing a strategy based on rewarding commitment (inbreeding)

4. Some organizational dilemmas

- Understanding the organizational features is essential, for understanding the different solution to the dilemmas.
- Universities operate in the context of institutionally embedded organizational dilemmas
- We know little about:
 - whether, in practice, access to a permanent academic position is governed by merit and universalism or by more parochial and particularistic factors;
 - We also lack a proper understanding of how institutional incentives and mechanisms for assigning recognition shape access to a permanent job and the consequences of the organizational strategies in academic careers
 - And how universities cope with the dilemmas between **retention and turnover, loyalty and mobility, universalism and particularism**, etc..

Tracking careers of doctorate holders could help us to understand the issues above.

5. Institutional foundations of heterogeneity (I)

5 Variables for understanding the different models of markets and careers in institutional context:

- Control on the number of staff, vacancies, evolution and autonomous decision power for recruiting and hiring over time.
- The balance between central control and delegation on the subunits and if the decisions over recruitment and promotion are executive or collegial

The way in which those variables are defined create incentives to increase the value of loyalty confronting uncertainty.

5. Institutional foundations of heterogeneity (II)

- Institutional and organizational autonomy for individual negotiating of working conditions and salaries enhance or inhibit the development of one or other type of market.
- The way in which institutions are funded, the contribution of researchers to overheads and the evaluations systems influences the authority structures and facilitate or difficult the development of incentives
- The availability of information accepted on the reputation, prestige, quality and outputs of institutions and the reputational value different actors allocate to this information is also key variable.

5. General Features of models of academic careers based in **internal labor markets**

- Limited relevance of educational and training external credentials
- Early entry in low level of the organizational structure
- Relevance of the training in the job
- Aims of the probationary periods: learning competencies more than demonstrated competencies
- Low salary dispersion, among scales and over the career
- Relevance on the part of the salary associated to seniority (years in the job)
- Implicit contracts that links recruitment, access to a permanent job and loyalty to the group and organization
- Possible contradiction between the intrinsic transferability of researcher competencies and this type of market

5. General features of the models based on the “academic jobs markets”

- High levels of mobility in all stages of the career; mobility as precondition of the hiring and promotion
- Results as precondition for recruitment (but in junior recruitment could be relevant external educational credentials as sign of potential)
 - The distribution of prestige among departments and institutions of origin (granting the PhD) could be the key variable to explain recruitment and career advancement
- Final results of the process of selection is conditions by the markets. Departments compete among them to fill out vacancies, applicants decide where to apply, departments make offers and candidate decide among them.
- There are some “*tenure track positions*”, whit a probationary period in which the key is not training but fulfilling objectives (publication, funding, etc.)
- There are individual negotiation or working conditions and higher salary dispersion
- Strong competition among institutions for the Human resources of higher quality, because the effect in reputation, getting funding resources and god students.

5. Two Organizational strategies

Retención & promoción del talento *interno*



Atracción de talento *externo* & fomento de *movilidad*



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5. Problems identified in careers that limit results in countries and institutions in international competition

- In countries with significant presence of internal labor markets it is important to assess the **tensions between role of merit, mobility and particularistic factors in recruitment, getting tenure and promotion.**
- Beyond the data on careers ,we should provide them with meaning because the institutional structures and organizational features of the R&D systems in countries determines the dilemmas
- Inbreeding and internal labor markets, associated to a limited or lack of mobility (especially international mobility)
- In the last decades Japan & Spain (mentioned in Science and Nature) regarding inbreeding and limited mobility.
- This “career” problems are associated to structural and systemic features.

5. Traditional model of career in southern E (I)

- Low levels of Mobility, national and international, pre and postdoctoral. Mobility is not rewarded.
- Dominant model in the career (Bachelor, master, PhD, tenure and promotion) in the same organization. Permanence is linked to early entry, but not necessarily more productivity.
- Entry moment in career is through a training position
- Lack of a well-defined career structure, without postdoctorate and tenure track” as clear stages in career.

6. Traditional model of career in southern E (II)

- Management of HHRR is a centralized function (creation, transformation, etc) with little delegation in subunits (evaluation and selection)
- The extreme institutional dependence of positions approved by external actors (depending on budgetary decision) could introduce perverse incentives regarding assessment of candidates (lack of standards)
- The entry and promotion determined by the investments decisions of government
- Limited capability strategic planning of HHRR by the institutions reinforce the inbreeding

6. Initiatives that contribute to break the internal labour markets models and have increased diversification

- Funding systems based on outputs (improve the recruitment strategies)
- New R&D policies and instruments of funding to support the opening of labor markets
- Creation of new Research centers not directly dependent on the Government and with management of human resources not linked to civil servant status, etc
- Emergence inside traditional institutions of new units (Institutes & groups) in which new types of employees linked to contracted research exist simultaneous with traditional positions (risk of Dualization).

- Tracking doctorate career is a good mechanism for analysis and for providing better opportunities for the management of institutions in which human resources are central

Thanks a lot for your attention!

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