

University Operating Grant Reform

-Japan's Issues, Overseas Case Studies-

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R e s e a r c h t h e m e

Government's "Strategic Plan 2007" (June 2007)

(1) Operating grant should be allocated to universities based on their efforts and performances on the next medium-term plan starting in FY2010

(2) The allocation will be done from the point of efforts for education and research, and internal management reform



Identify agenda and strategy for reform of operating grant funding system with analyzing the possibility of performance-based funding in Japan

Outline

1. Current system of operating grant funding and its problems
2. Current system of education and research evaluation and problems
3. Funding systems among major OECD countries
4. Simulation of new funding rules
5. Conclusion

1.1 Current structure of operating grant

FY2006 Budget Total 1,221.5 billion yen



Budget figures for grant

FY2004 1,241.6 billion yen

FY2007 1,231.7 (-0.8%)

FY2006 1,221.5 (-0.8%)

FY2007 1,204.4 (-1.4%)

FY2008 1,181.3 (-1.9%) + own revenue 999.5 billion yen

B: Special allowance

C: special grant to enhance education and research

D: Grant for hospital

1.2 Funding rule of operating grant

Total grant for each university =
+ General grant (administration
+ **education & research** + others)
+ Special allowance + special grant to enhance
education & research + grant for hospital
- own revenue

Education & research = previous year's
 $\times \alpha \times \beta \times \gamma$

α : efficiency coefficient

β : education & research coefficient

γ : organizational coefficient

1.3 Line-item budget in old days

Structure of budget of national university from FY1964 when its special account was established

- 1. Expense for administration and management**
- 2. Expense for education and research**

General portion

based on number of teachers by type

based on number of students

Special grant for education and research

✕General portion abolished in FY2000

Double structure

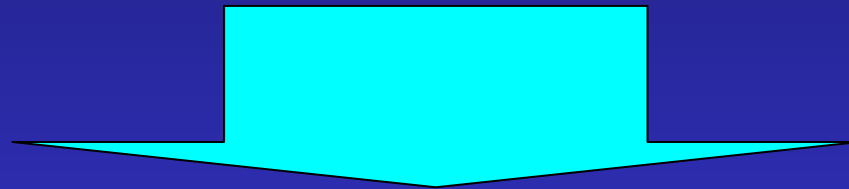
1.research university, graduate university

2.education university, undergraduate university

1.4 Problems of current funding rule

**Current funding inherits old funding rule,
namely related to number of teachers**

Cannot assess equity and rationality of funding



- 1. Not transparent on funding process**
- 2. Not fair and equitable competitive environment**
- 3. No incentive for improve efficiency and quality**

2.1 National university and evaluation

1. Self Check-up Evaluation (School Education Law)

2. Accreditation assessment (SE Law, every 7 years)

3. Corporate evaluation (Corporatized National University Law)

(1) Annual evaluation (performance measurement)

**(2) Overall evaluation for medium-term plan
(to what extent goals are achieved)**

2.2 Time frame for overall evaluation

FY2007
4th year

FY2008
5th year

FY2009
6th year

FY2010
1st year

**University /
performance
report** →

**Accreditation & Evaluation
Agency / education and
research evaluation** →

**University Evaluation
Committee / Overall
evaluation** →

**Results should be
linked to funding
on the next
Medium-term plan**

2.3 What are evaluated as overall evaluation

1. Quality of education and research

2. Improvement and efficiency in management

3. Improvement in financial position

4. Self-check up and assessment, reporting

5. Others (capital management, security)

- 
- (1) Education : ① Organization and implementation
② Contents ③ Method ④ Achievements ⑤ Employment
- (2) Research : ① Research activity and implementation
② Performance and result

2.4 Example of assessment

[Quality of education] Self-evaluation + Accreditation Agency

- **Score for each 5 items : ①much better than expected result
②better than expected ③on average ④worse than expected
4 grades score (case of self-evaluation)**
- **Evidence data to support the above evaluation required
(eg: number of students and teachers, number of degree,
employment)**

[Management] Self-evaluation + Univ. Evaluation Committee

- **Score for to what extent goals are achieved : ①excellent
②better ③good ④not enough ⑤improvement required
5 grades score (Univ. Evaluation Committee)**

2.5 Problems of education and research evaluation

- 1. Increase in paper work**
(a number of evaluation items, most of them qualitative and abstractive)
- 2. Indicators presented when the game is almost over**
- 3. Almost no indicators to assess across universities**
(assess to what extent qualitative goals, mainly related to process are achieved)
- 4. Basics of evaluation, namely “Logic Model” not applied**

Is the current evaluation sufficiently credible for resource allocation ?

3.1 Funding rules of general grant among OECD

	Line-item Negotiation	Block Formula			Competitive Negotiation
		Incremental	Indicator-based	Performance-based	
Education research together	Japan (Old System)	Japan (general grant)	Germany (states) US (states)	Germany (some states) US (some states) Finland	Japan (special grant) Finland (development)
Education research separated			Ed/Australia Ed/UK Ed/Nether Ed/France Ed&Re/ Sweden	Ed&Re/ Au Re/UK Re/Netherlands	

3.2 Performance-based funding in state governments, US

Survey	Number	States which introduce performance-based funding
1997	10 (20%)	Colorado, Connecticut, Florida, Kentucky, Minnesota, Missouri, Ohio, South Carolina, Tennessee, Washington
2001	19 (38%)	Arkansas, California, Colorado, Connecticut, Florida, Idaho, Illinois, Kansas, Louisiana, Missouri, New Jersey, New York, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas

Burke (2002)

1. Tennessee, pioneer of p-based funding in 1978, its number increasing but some states abolished (Some states such as Tennessee and Missouri continuously implementing)
2. Amount of dollar for p-based funding , at maximum, 5% of the total general grant
3. The number and type of performance indicators vary from state to state, in South Carolina, the number 14, score for each indicator graded with 1, 2 and 3, then average score calculated, universities grouped into 5 based on the average score, amount of grant adjusted with this final result

3.3 Major education and research grants in Australia

Comprehensive reform undergoing by Higher Education Support Act 2003

[Education: Commonwealth Grant Scheme (CGS)]

- New funding rule since 2005
- Every year the number of students supported by the government is decided by the negotiation between the government and university, and agreement is made with some flexible measures for over or under enrollment)
- Grant for each university is calculated by multiplying student numbers with government contribution (unit cost) by type of subjects

[Education: Learning and Teaching Performance Fund (LTPF)]

- Performance-based funding newly introduced in 2006

[Research: Research Training Scheme (RTS)]

- Funding based on indicators (number of papers, research revenue, number of degrees), 8 universities get 70% of the total fund
- New funding rule will be introduced in 2009 with focus on research quality

3.4 How to allocate money in LTPF

(1) **7 performance indicators** by 4 subjects (health, humanities, law & economics, science)

Satisfaction : ①graduate generic skills, ②graduate good teaching,
③overall graduate satisfaction

Outcomes: ④full-time employment, ⑤part or full-time further study

Success: ⑥progress rate, ⑦retention rate

(2) Adjusted indicators calculated by regression analysis and other technique to control external factors such as unemployment rate, then standardization of adjusted indicators to produce composite indices

(3) **Expert Panel** reviews the results and provide a report to the Minister and makes recommendations on specific amounts of funding for each university

(4) The minister makes the final decision

[Funding result for FY2006]

the total amount 54 million AU dollars (2% of CGS)

13 universities out of 40 received (1.1~10.4 million AU \$)

3.5 Issues of CGS and lessons

1. Reviews including public consultations were done in 2006, then the some improvements were included in FY2007 Budget, for instance, the number of subjects which is used for the allocation was reduced from 14 to 7 (more flexible), penalty for excess enrollment was eliminated

2. It is criticized the amount of CGS cannot catch up the increase in wages price, although it increases every year.

3. The government's contribution which is taken as a unit cost by subject doesn't mean the full cost of teaching. The ratio of contribution to the teaching cost varies from subject to subject, but it is estimated 70% on average in University of New South Wales

It seems difficult that the amount of operating grant is indexed to the increase in wages or price because the total resource is decided politically in the budget process. The structure of teaching cost varies from university to university.

In this context, it is rational and transparent to allocate resources based on the relative cost by subject and the number of students.

3.6 Issues of LTPF and lessons

1. LTPF was allocated in 2006, 2007 and 2008. It is improving every year because a number of public consultations are done
2. The technical problems include (1) the difficulty to measure the quality of teaching, the credibility of surveys to measure students satisfaction, (2) side effects and manipulation of evaluation
3. It is suggested that the resource allocation should be done based on to what extent the teaching performance is improved, rather than the level of it, and the amount of allocation is volatile every year

At the moment, there is little decisive evidence that LTPF contributes to the improvement in teaching performance, but most of stakeholders think LTPF results in that people focus on how to improve the quality of teaching and how to improve it (eg. guidance and training program for teachers)

✘ Australia has been developing about 300 performance indicators including raw and adjusted on students, teachers, finance, research and outcomes since the beginning of 1990s

3.7 Performance of performance-based funding

[Burke and Modarresi (2000)]

- In the US, views on performance-based funding are divided
- The goal of accountability moved from accounting for expenditure to demonstrating performance in the mid-1980s
- The lack of agreement on the means of assessing students' achievements
- Stressed efficiency and quality and slighted equity and choice indicators
- The importance of adopting enough but not too many indicators
- Dilemma of performance funding, its desirability and its difficulty

[Morgan (2004)]

- There has been relatively little opposition to the research assessment exercise
- However, the high cost in time as well as money in preparing submissions

[Liefner (2003)]

- A number of interviews with universities in Switzerland, UK and USA
- The link between performance-based budgeting resource and the success of universities must be weak
- Universities with a large number of highly motivated and qualified faculty will be successful regardless on the form of resource allocation
- Help to adjust the organizational structure of universities more quickly to emerging needs and opportunities

4.1 Previous researches on funding simulations

Shima (2003) "Funding Rule of National University"

- **Estimated allocations based on proposed funding rule before corporatization**
- **Confirmed proposed funding rule doesn't make a significant difference in terms of amount of money**
- **If "Education expense" for FY1998 are allocated based on the number of students and unit cost by subject, the estimated allocation differs from the actual allocation by 37% on average**

Yoshida (2003) "Funding System of University Grant"

- **Current expense excluding salary for FY1996 allocated based on the number of students and unit cost by subjects**
- **Losers: regional large universities, new medical college, new teaching college**
Winners: newly established universities, old teaching college

4.2 Purpose of simulation and assumptions

- 1. Estimate allocations for each university based on indicators-based rule and performance-based rule**
- 2. Analyze to what extent the new allocation differs from the actual one, then the relationship between various funding rule and allocation results**

[Some assumptions]

- ① Original data taken from each university's final accounts for FY2006, estimate expenditure for teaching and that for research excluding hospitals**
- ② Convert above figures to expenditures in terms of budget base, then obtain the total expenditure for teaching and research respectively**

4.3 Simulation for teaching grant

Sim1 : Number of students

- ① Estimate a unit cost per student by dividing the total teaching expenditure of a single subject college with her number of students, then get the average
- ② Estimate the adjusted number of students by multiplying the number of students with a unit cost by 4 subjects
- ③ Get the new allocation by multiplying the total teaching expenditure with the ratio of the adjusted number (②) to the total adjusted number of students

Sim2 : Performance-based

- ① Score each university performance with 4 grades based on 3 indicators (Ratio of increase in teaching expenditure, FY2004→06, Teaching expenditure per student, FY2006, Number of GP award, FY2003~07)
- ② Multiplying the adjusted number of students with the weight of 120%, 100%, 50% and 0% according to performance produces the performance-adjusted number of students, then allocate the total teaching expenditure into each university

Sim3 : Student 90% + performance 10%

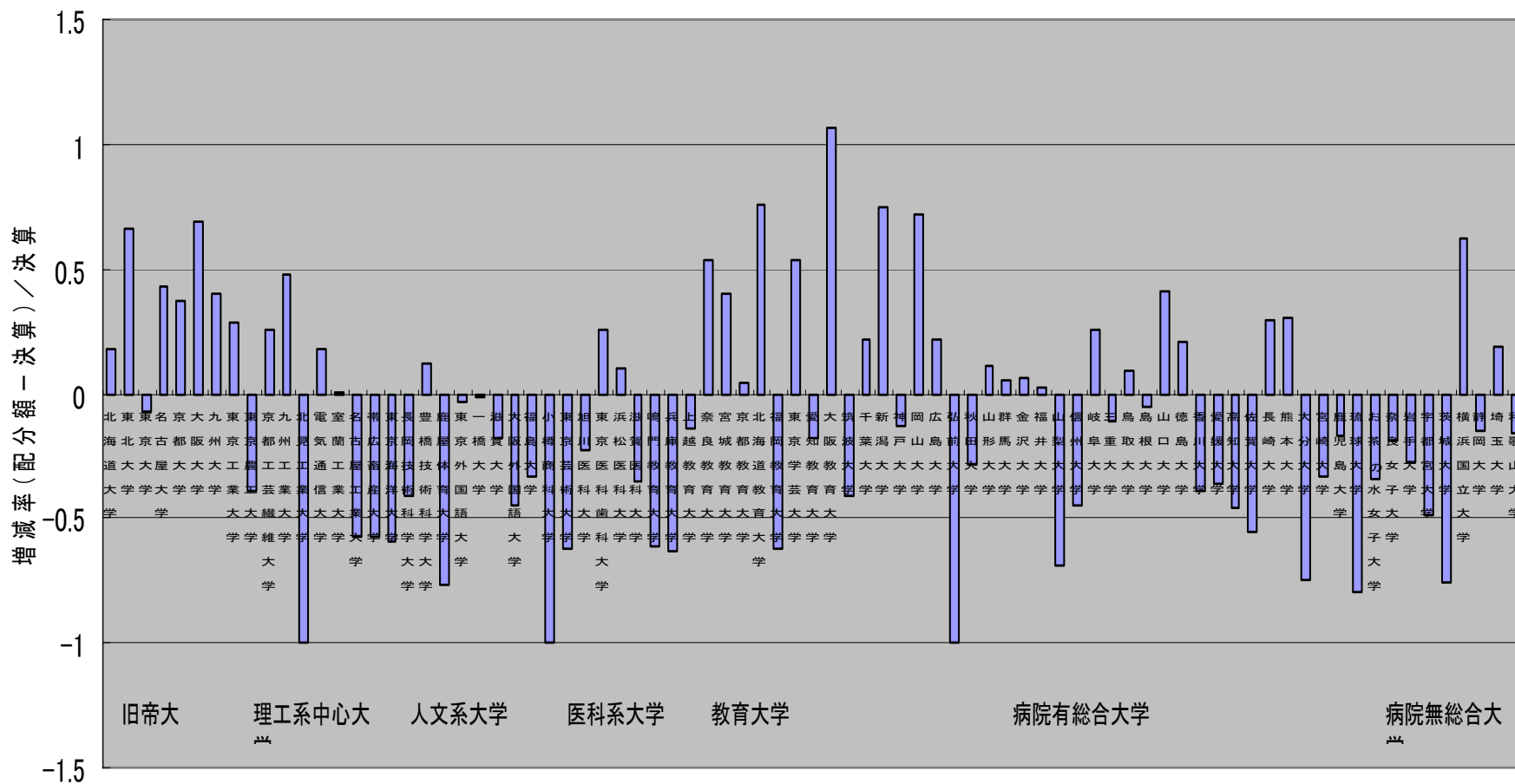
4.4 Teaching unit cost by subjects

(thousands yen)

Subject	All relevant universities				Simulation	
	No of U	Lowest	Highest	Average	No of U	Average
Humanities	8	428	1,607	784	6	526
Science	12	348	1,617	783	6	629
Education	11	728	2,000	1,136	11	1,136
Medical	4	1,042	1,354	1,177	4	1,177

4.6 Simulation 2 : Performance-based

教育経費シミュレーション(業績基準)



Regional
large Univ.

Science
Col

Humanities
Col.

Medical
Col.

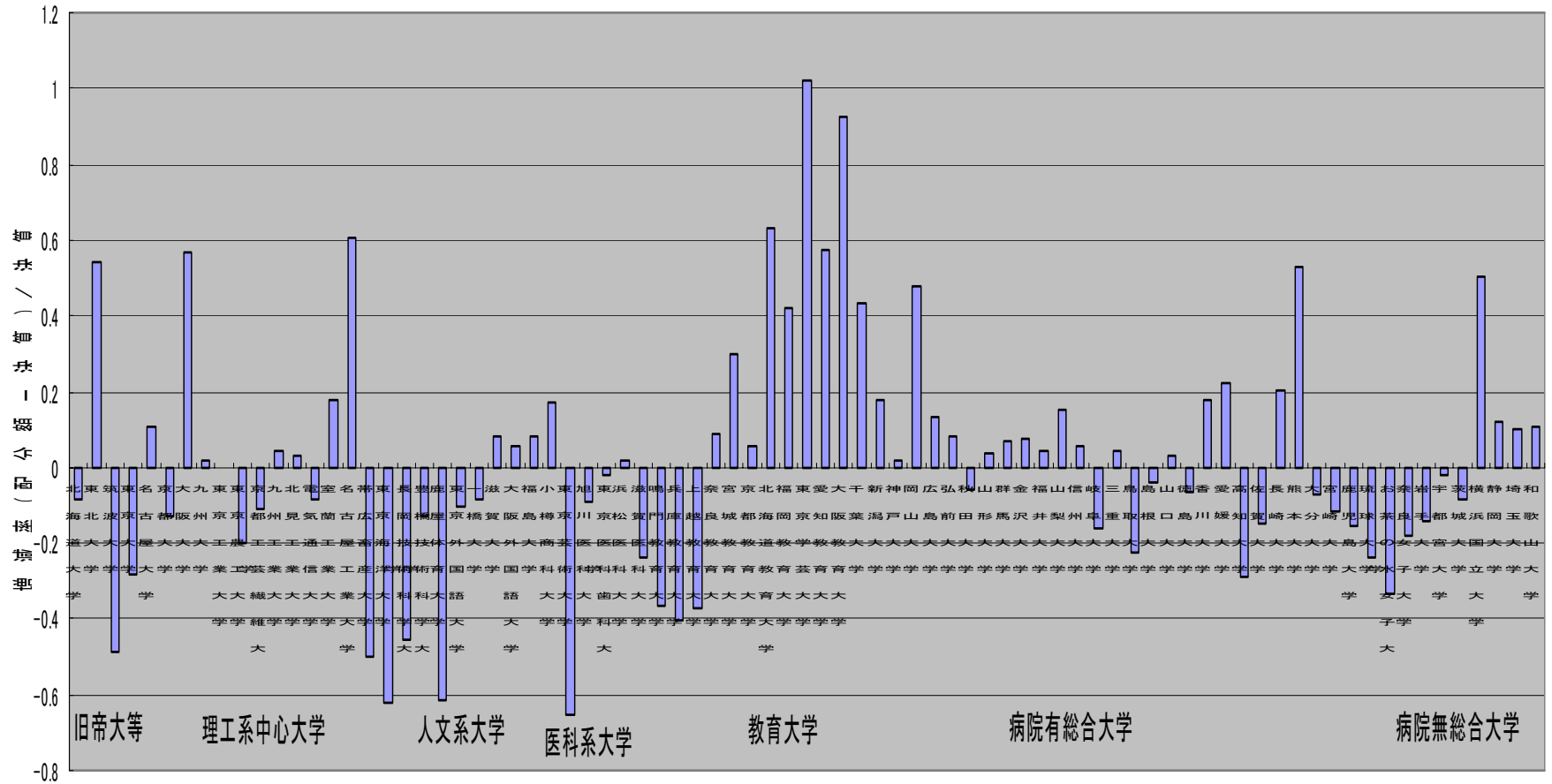
Education
Col.

Univ. with
medical

Univ. without
medical

4.7 Simulation 3 : Students 90% + performance 10%

教育経費シミュレーション(学生数90%+業績10%)



Regional
large Univ.

Science
Col

Humanities
Col.

Medical
Col.

Education
Col.

Univ. with
medical

Univ. without
medical

4.8 Findings in the simulations

1. In the case of the number of students, lower a unit cost than the national average. more resource allocation. the rate of deviation from the actual allocations varies by types of universities, in particular colleges for education it is high

Average rate of deviation

Humanities: $\Delta 17\%$ Science: $\Delta 15\%$ Regional large universities: $\Delta 11\%$ Medical: $\Delta 8\%$ Local universities: $+5\%$ Education: $+30\%$

2. In the case of education performance, the number of universities which lost money is larger than that in the case of student number, and winners are spread over nationally

4.9 Simulation for research grant

Sim1 : Number of teachers

- Allocate resources based on the number of teachers adjusted by the unit cost of research by subjects

Sim2 : Teachers + doctoral students

Sim3 : Research revenue from "Competitive Grant"

- Allocate based on the average share of research revenue (FY2004~06)

Sim4 : Research performance

- Allocate based on two indicators (research revenue per teacher, number of citation) which classify universities into 4 grades

Sim5 : Teachers 50% + performance 50%

Sim6 : Actual grant 50% + performance 50%

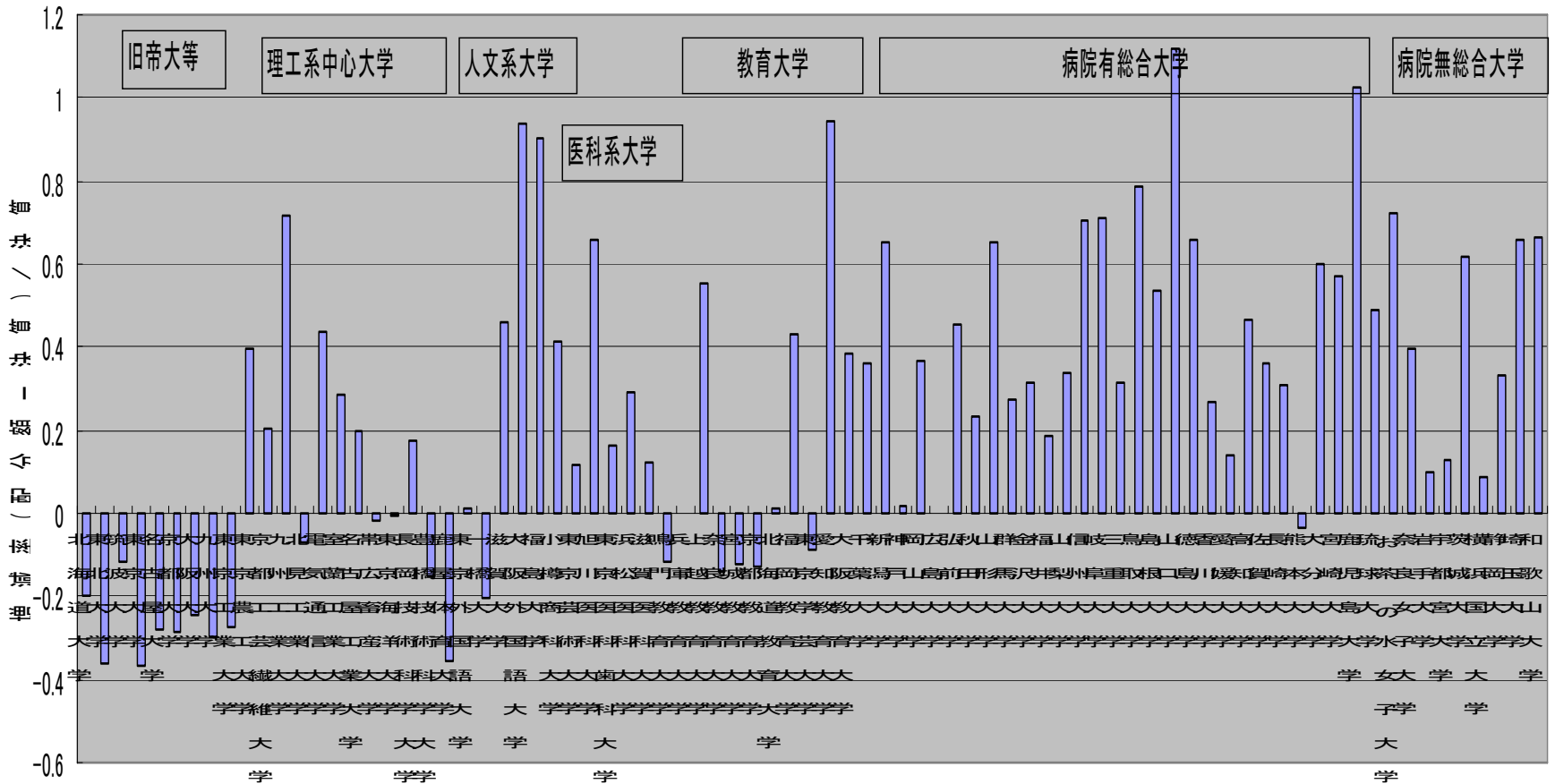
4.10 research unit cost by subject

(thousands yen)

Subject	All relevant universities				Simulation	
	No of U	Lowest	Highest	Average	No of U	Average
Humanities	8	2,393	5,712	4,050	6	3,548
Science	12	7,034	13,978	9,225	6	7,885
Education	11	2,389	5,222	4,236	11	4,236
Medical	4	7,036	10,462	9,122	4	9,122

4.11 Simulation 1 : Number of teachers

研究經費シミュレーション(教員数基準)



Regional
large Univ.

Science
Col

Humanities
Col.

Medical
Col.

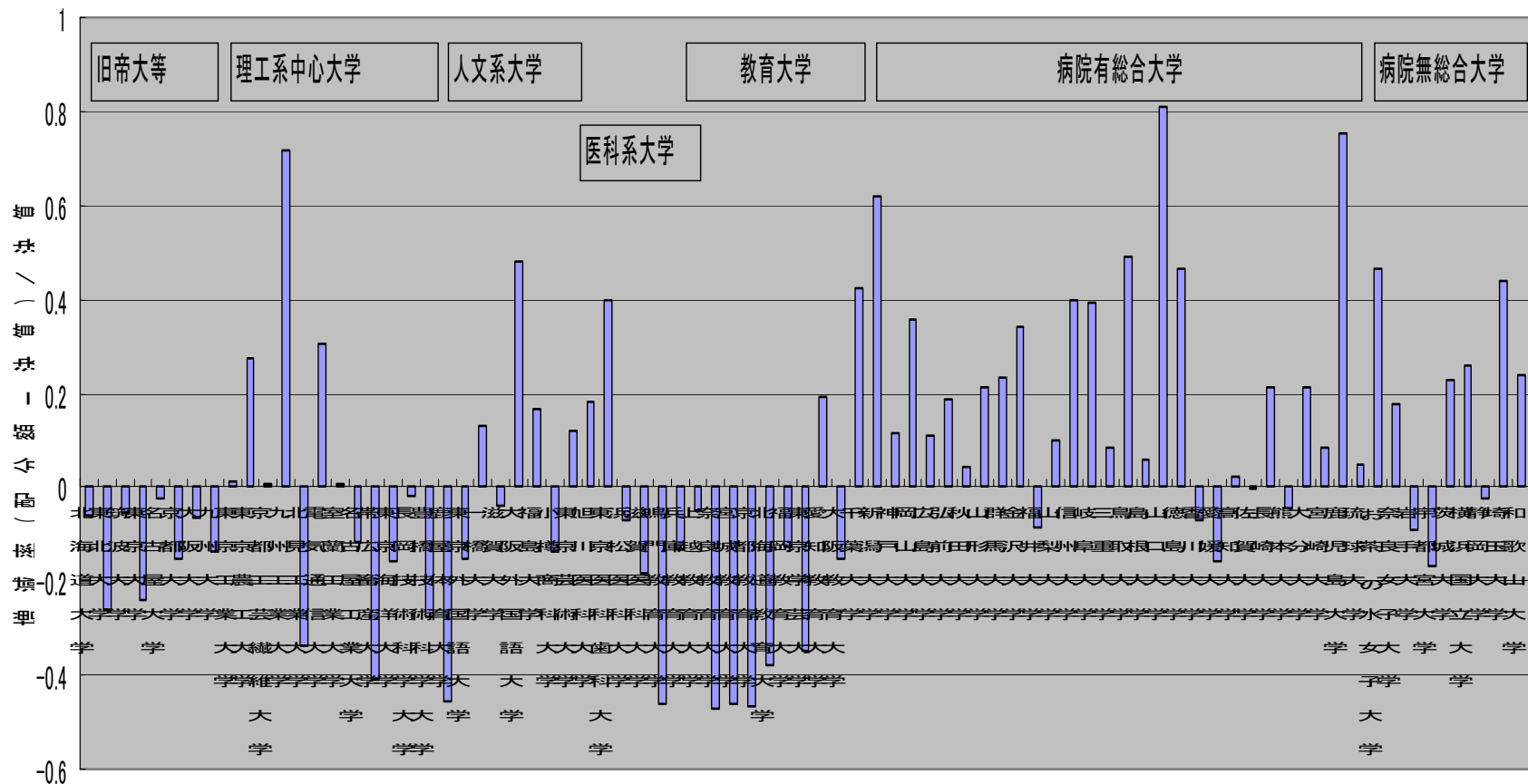
Education
Col.

Univ. with
medical

Univ. without
medical

4.12 Simulation 2 : Teacher + doctoral

研究経費シミュレーション(教員数+博士課程学生数)基準



Regional
large Univ.

Science
Col

Humanities
Col.

Medical
Col.

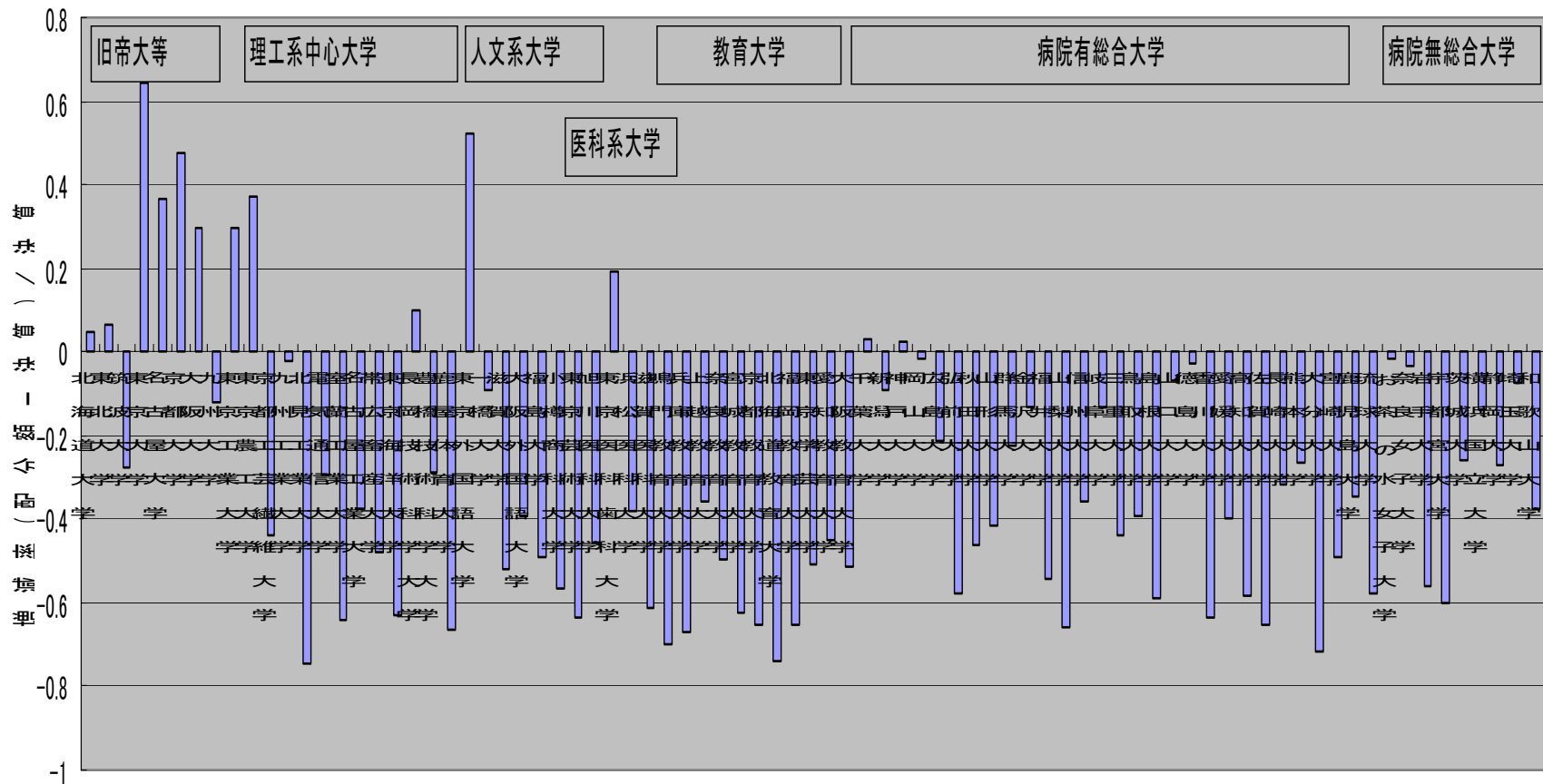
Education
Col.

Univ. with
medical

Univ. without
medical

4.13 Simulation 3 : Research revenue

研究経費シミュレーション(科研費基準)



Regional
large Univ.

Science
Col

Humanities
Col.

Medical
Col.

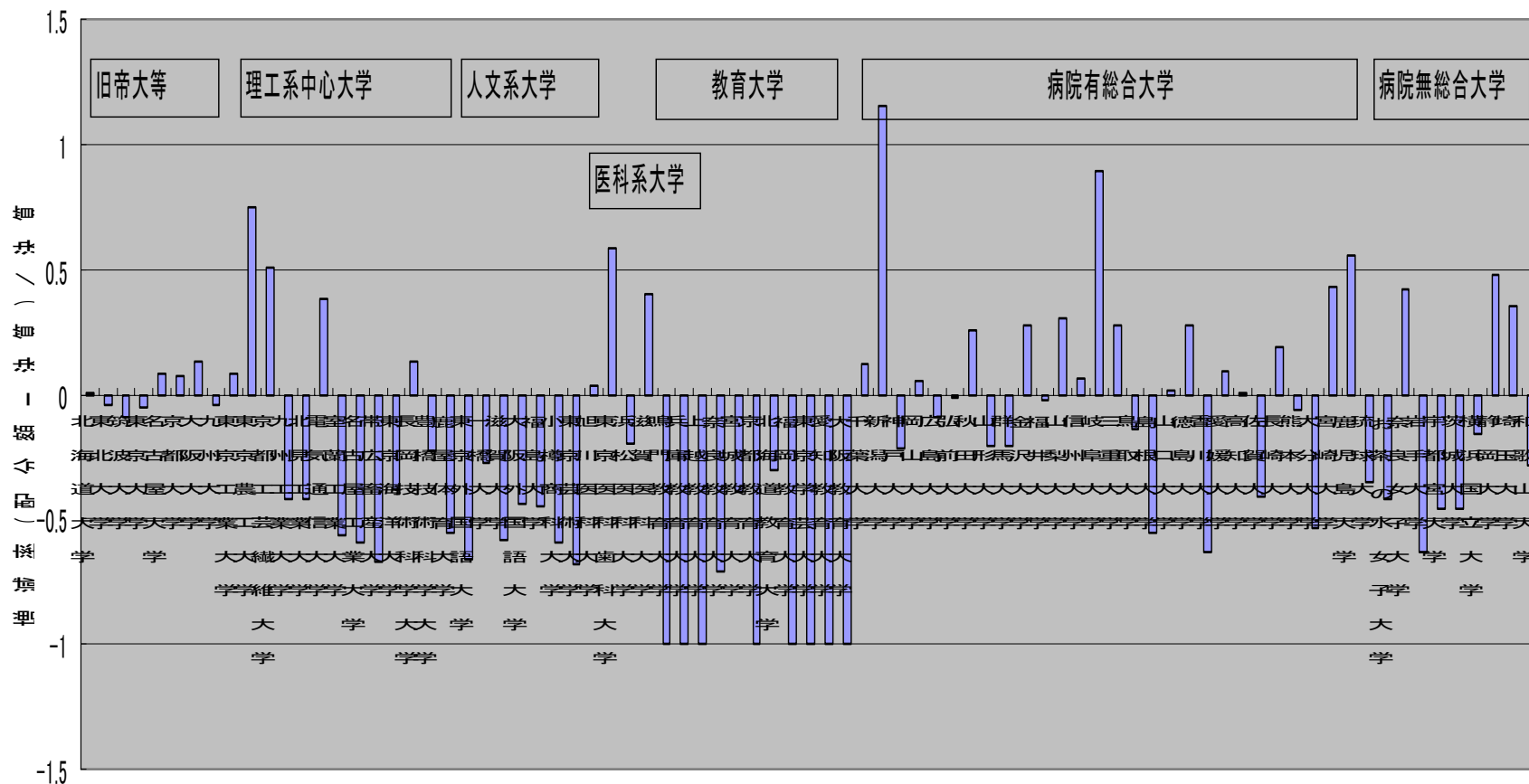
Education
Col.

Univ. with
medical

Univ. without
medical

4.14 Simulation 4 : Research performance

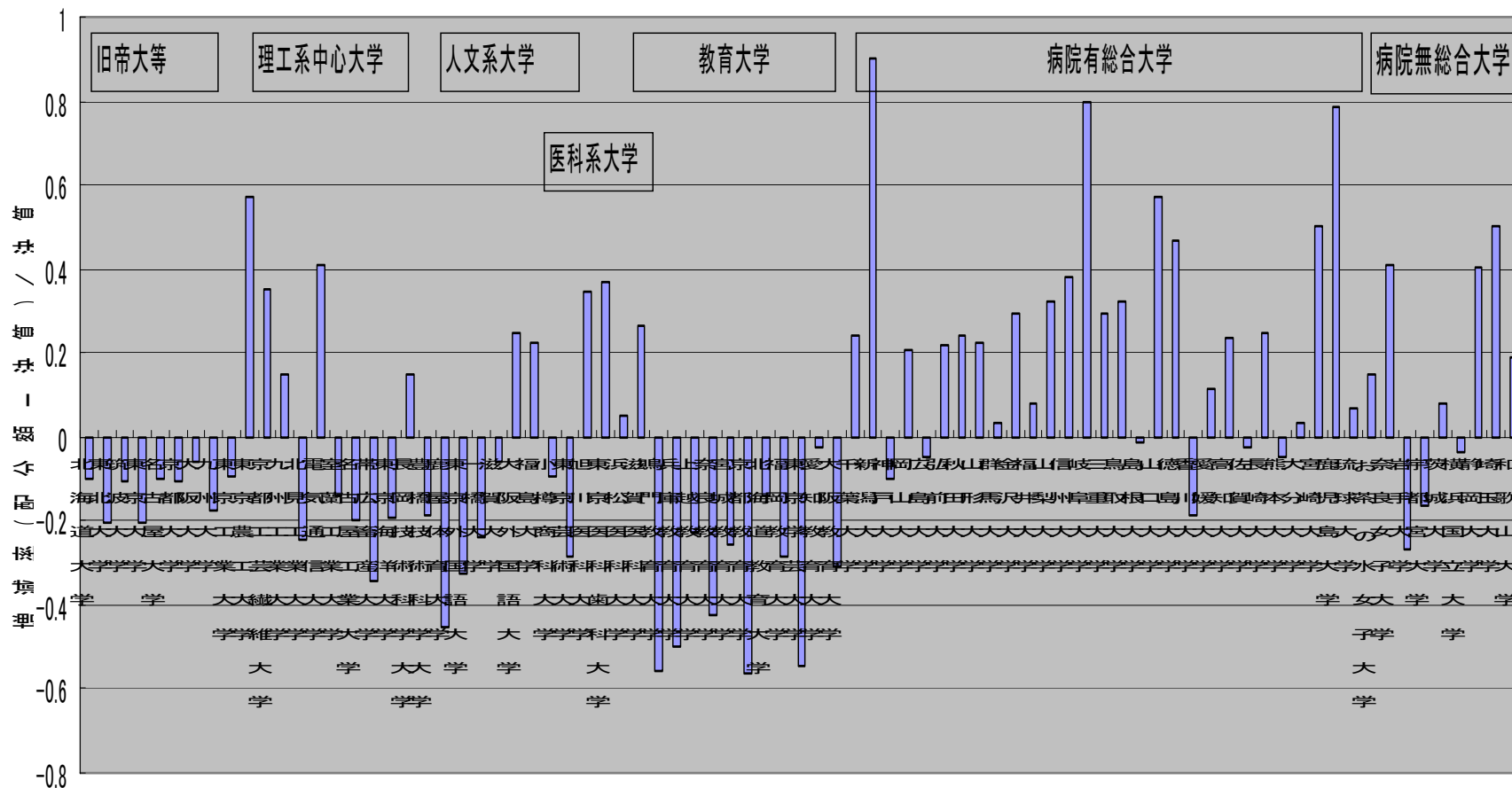
研究経費シミュレーション(2指標成果基準)



Regional large Univ. Science Col. Humanities Col. Medical Col. Education Col. Univ. with medical Univ. without medical

4.15 Simulation 5: Teacher 50% + performance 50%

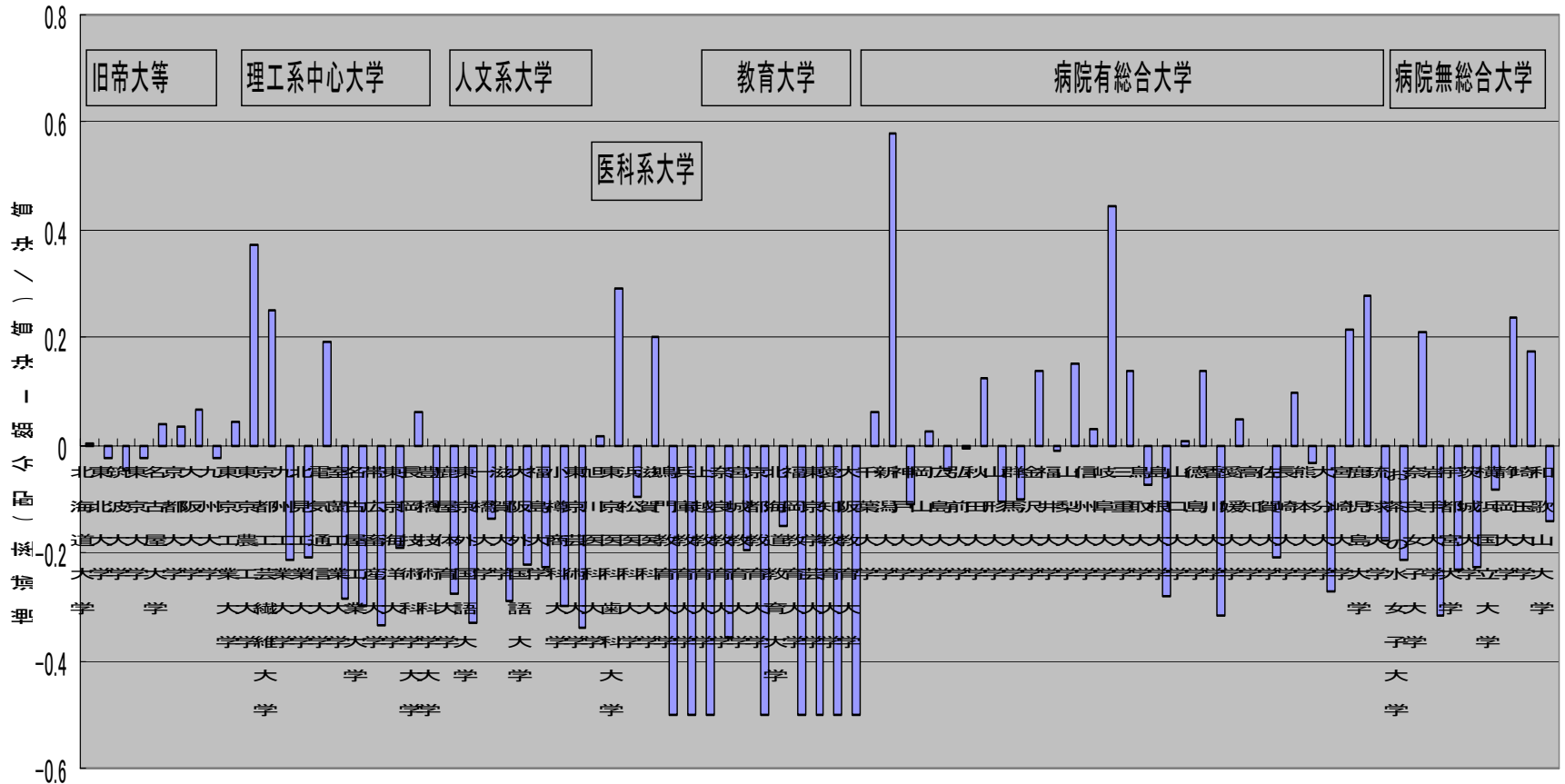
研究経費シミュレーション(50%教員数、50%成果基準)



Regional large Univ. Science Col Humanities Col. Medical Col. Education Col. Univ. with medical Univ. without medical

4.16 Simulation 6: Actual 50% + performance 50%

研究経費シミュレーション(50%研究総経費、50%成果基準)



Regional
large Univ.

Science
Col

Humanities
Col.

Medical
Col.

Education
Col.

Univ. with
medical

Univ. without
medical

4.17 Correlation coefficients between changes in funding

	E-S1	E-S2	E-S3	R-S1	R-S2	R-S3	R-S4	R-S5	R-S6
Edu-Sim1	1.000								
Edu-Sim2	0.408	1.000							
Edu-Sim3	0.991	0.525	1.000						
Res-Sim1	0.040	-0.15	0.015	1.000					
Res-Sim2	-0.04	0.127	-0.02	0.753	1.000				
Res-Sim3	-0.05	0.439	0.168	-0.19	0.294	1.000			
Res-Sim4	-0.13	0.241	-0.09	0.143	0.486	0.438	1.000		
Res-Sim5	-0.08	0.095	-0.06	0.674	0.790	0.224	0.828	1.000	
Res-Sim6	-0.13	0.241	-0.09	0.143	0.486	0.438	1.000	0.828	1.000

4.18 Findings in the simulations

Funding rules make differences for resource allocations, because they are affected by the characteristics of universities such as research university or cost of research (←the current operating grant doesn't take into account it)

- ① In the case of students, universities except regional large ones get more
- ② In the case of teachers and doctoral students, science and education in addition to regional large universities lose money
- ③ In the case of competitive research revenue, only regional large ones win
- ④ In the case of research performance, education, humanities, most science lose money, but among other types winners and losers coexist
- ⑤ In the case of teachers 50%+research performance 50%, education, regional large universities, a half of humanities and science lose money
- ⑥ In the case of actual result 50%+research performance 50%, education, humanities, a half of science lose money, among others types, winners and losers coexist

5.1 Conclusions: problems

1. The current rule of operating grant for universities

- ① The fairness and equity on allocation cannot be verified, thus the rule is not transparent
- ② Little incentive for efficiency and quality (in particular outputs and outcomes cannot be assessed against input)

✘ For instance, even if universities get more money in relation to the number of students and teachers, it may be acceptable if their performances are better than others. However there seems little evidence to support this

2. The current system of education and research evaluation focus on processes of each university, rather than outputs and outcomes which are comparable across universities

5.2 Conclusions: agenda for reform

- 1. If you focus on performances and results, you have to establish a fair and equitable environment for competition. In particular, grant for education should be separated from grant for research, then universities are required to compete each other to strengthen their strengths**
- 2. First of all, we have to discuss how to measure the quality or outcomes of education and research, and collect performance data (stakeholders are required to discuss issues by comparing performances with cost of services)**
- 3. Performance-based funding has not only technical problems but also side effects. We have to keep its limitation in our mind. If you want to improve education and research, you need the comprehensive reform including human resources management and corporate governance**