A Consideration of the Financial System of the National Universities
A Structural Analysis of Operating Grants

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Background to this paper

◎ **Starting in April 2004, the Japanese national universities became National University Corporations.**

◎ **All grants from the Ministry of Education, Culture, Sports, Science and Technology (MEXT) have been standardized as operating grants to be used freely.**

◎ **Since 2005, operating grants have decreased according to a uniform rule (decreases are expected to continue until fiscal 2009).**

◎ **Special educational research budgets are allocated on a competitive basis.**

◎ **Starting in fiscal 2010 a results-based system for decisions on allocation of operating grants will be introduced.**

◎**Regional universities are concerned about major cuts in operating grants.**

Aims

◎ In considering Japan's future, the modality of universities as higher education and the modality of the country's governance (especially grants) are of the utmost importance.

◎ While educational philosophy and the theory of human capital are debated, there is almost no analysis of educational finance.

◎ The modality of grants to each university (should the allocation basis be efficiency or fairness?) has hardly been debated.

Content of this presentation

(1) Clarification of the operating grant system

◎ Finances after the transition to National University corporations

◎ Consideration of universities with affiliated hospitals

◎ Allocation of operating grants

◎ Special grant to enhance education and research

(2) Analysis of factors for decisions on operating grants

◎ Students or faculty? ◎ Efficient or equitable?

(3) Conclusions

(Addendum) Operating grants and existing performance indicators

◎ Education, research, social contribution, preliminary analysis

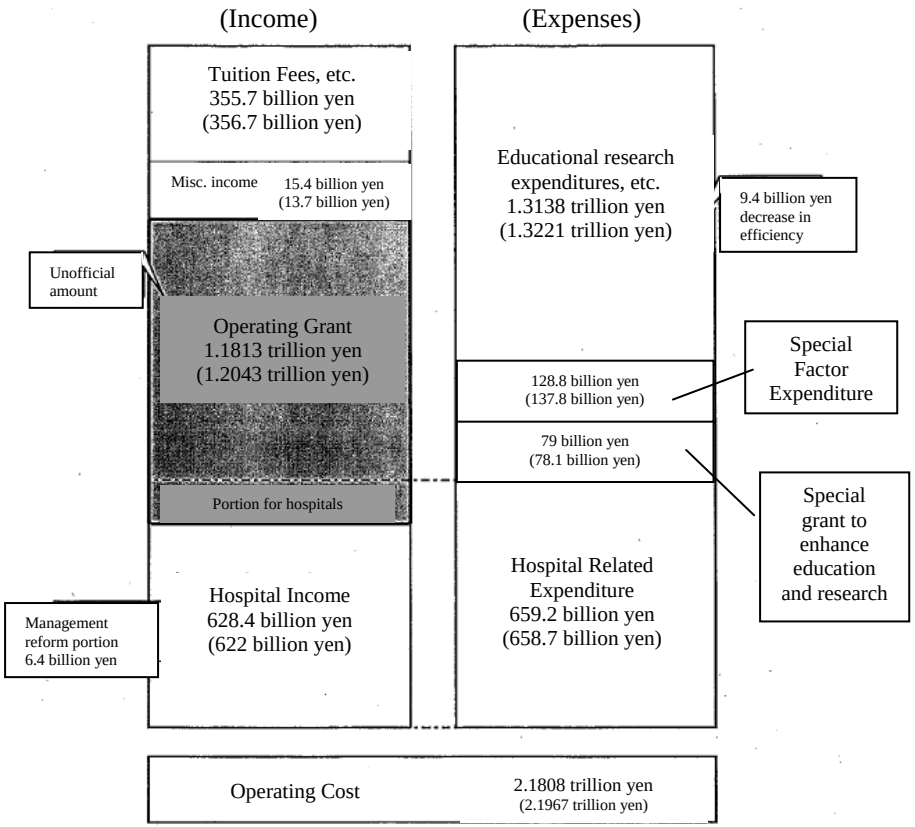
<Remaining topics>

→ Information provision for a modality of effective fund allocation.

(1) Clarification of the operating grant system

◎ Finances after the transition to National University corporations

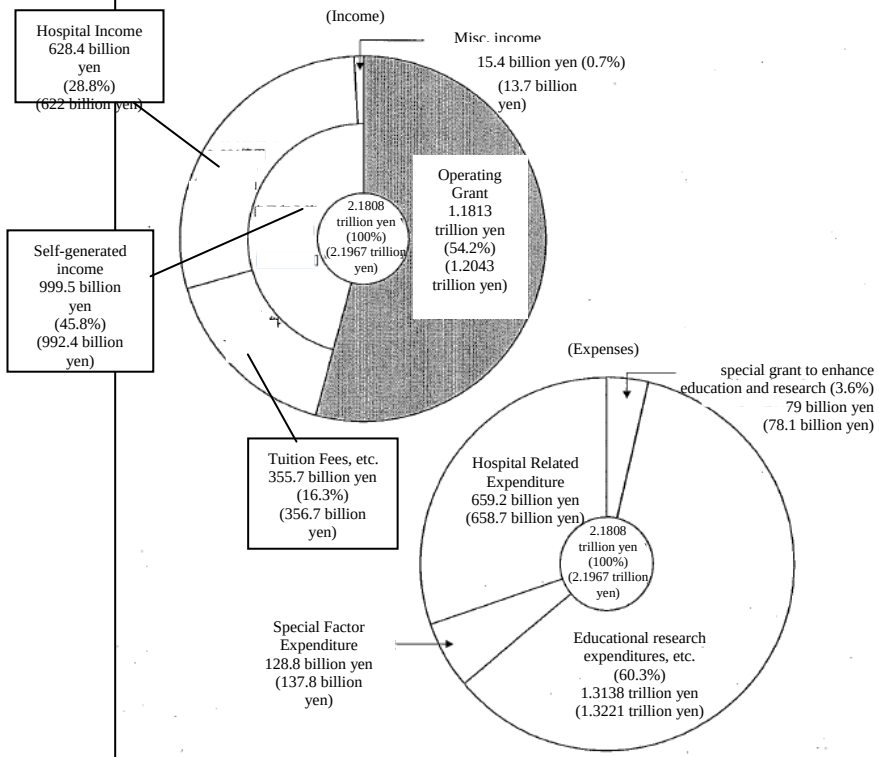
Overview of Planned FY2008 Budget for National University Corporations
(90 corporations including inter-university research institutes)



1. In this chart, outside funding (contract research income, income from donations, income from patent royalties, etc.) and other income that falls outside of the calculation for operating grants is not included.
2. Figures in parenthesis are the amount for the previous fiscal year.
3. Amounts for "Educational research expenditures, etc." and "special grant to enhance education and researchs" for the previous fiscal year are partially combined.

Structure of Planned FY2008 Budget for National University Corporations
(90 corporations including inter-university research institutes)

FY2007 Operating Grant Budget Amount	FY2008 Operating Grant Planned Amount	Year-on-year change	Rate of change
1.2043 trillion yen	1.813 trillion yen	-23 billion yen	-1.9%



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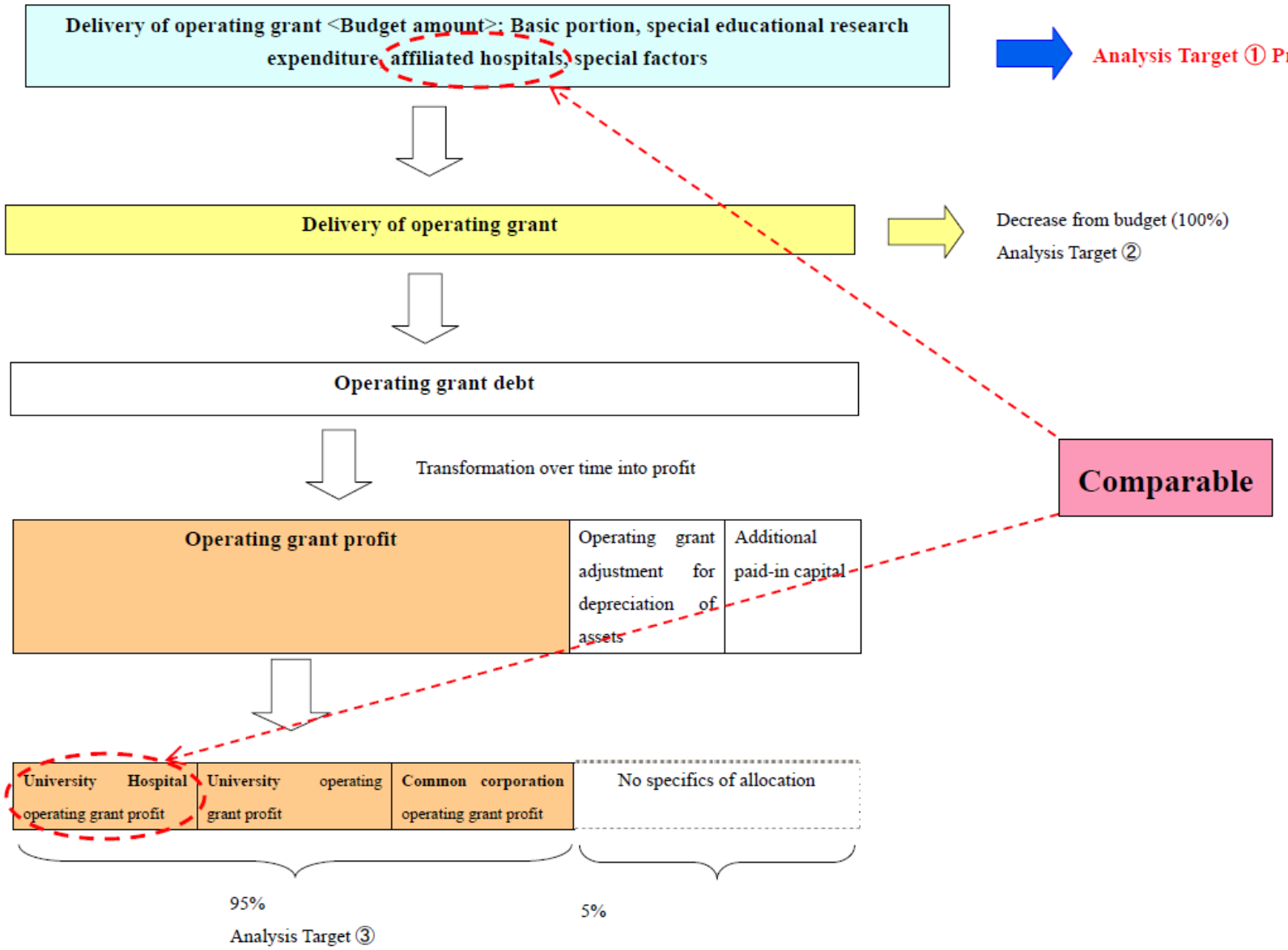
Flow of accounting procedures for operating grants and analysis



2006

Unit: ¥1000	University	Budget	Grant amount	Final account	Budget－Grant amount	Budget－Final account	Grant amount－Final account	Budget	Final account	Budget－Final account	Budget	Final account	Budget－Final account
University type		Operating grant	Operating grant	Operating grant				Non-hospital	Non-hospital	Non-hospital	hospital	hospital	hospital
Large universities	Hokkaido University, Tohoku University, University of Tsukuba, Chiba University, The University of Tokyo, Niigata University, Nagoya University, Kyoto University, Osaka University, Kobe University, Okayama University, Hiroshima University, Kyushu University	540459818	540458900	503972500	918	36487318	36486400	512559223	429281520	83277703	27900595	74690980	-46790385
Mid-sized universities with affiliated hospital	Hirosaki University, Akita University, Yamagata University, Gunma University, Kanazawa University, University of Fukui, University of Yamanashi, Shinshu University, Gifu University, Mie University, Tottori University, Shimane University, Yamaguchi University, The University of Tokushima, Kagawa University, Ehime University, Kochi University, Saga University, Nagasaki University, Kumamoto University, Oita University, University of Miyazaki, Kagoshima University, University of the Ryukyus	309506525	309495100	294768000	11425	14738525	14727100	298989190	235754600	63234590	10517335	59013400	-48496065
Medical universities	Asahikawa Medical College, Tokyo Medical and Dental University, Hamamatsu University School of Medicine, Shiga University of Medical Science	33825077	33824900	32365700	177	1459377	1459200	29711877	19459200	10252677	4113200	12906500	-8793300
Science and engineering focused universities	Muroran Institute of Technology, Obihiro University of Agriculture and Veterinary Medicine, Kitami Institute of Technology, Tokyo University of Agriculture and Technology, Tokyo Institute of Technology, Tokyo University of Marine Science and Technology, The University of Electro-Communications, Nagaoka University of Technology, Nagoya Institute of Technology, Toyohashi University of Technology, Kyoto Institute of Technology, Kyushu Institute of Technology, National Institute of Fitness and Sports in Kanoya	73305634	73305000	70851900	634	2453734	2453100	73305634	70851900	2453734			
Liberal arts universities	Otaru University of Commerce, Fukushima University, Tokyo University of Foreign Studies, Tokyo University of the Arts, Hitotsubashi University, Shiga University, Osaka University of Foreign Studies	24735757	24735400	23758400	357	977357	977000	24735757	23758400	977357			
Education university	Hokkaido University of Education, Miyagi University of Education, Tokyo Gakugei University, Joetsu University of Education, Aichi University of Education, Kyoto University of Education, Osaka Kyoiku University, Hyogo University of Teacher Education, Nara University of Education, Naruto University of Education, Fukuoka University of Education	52520300	52519900	50474700	400	2045600	2045200	52520300	50474700	2045600			
Graduate school	The Graduate University for Advanced Studies, National Graduate Institute for Policy Studies, Japan Advanced Institute of Science and Technology, Nara Institute of Science and Technology	102434835	102433800	97078000	1035	5356835	5355800	102434835	97078000	5356835			
Mid-sized universities without affiliated hospital	Iwate University, Ibaraki University, Utsunomiya University, Saitama University, Ochanomizu University, Yokohama National University, Shizuoka University, Nara Women's University, Wakayama University	59732036	59731700	58012100	336	1719936	1719600	59732036	58012100	1719936			

・ Data for Toyama University is not included in the comparison due to difficulties in adjustment.

◎ Consideration of universities with affiliated hospitals
Rules for calculating operating grants for university-affiliated hospitals

○ Operating grant for university-affiliated hospital (budget) =

General physician expenditure (fixed in fiscal 2004 budget) - Income of affiliated hospital

+ Special factors expenditures for affiliated hospital + Expenditure for payback of obligations

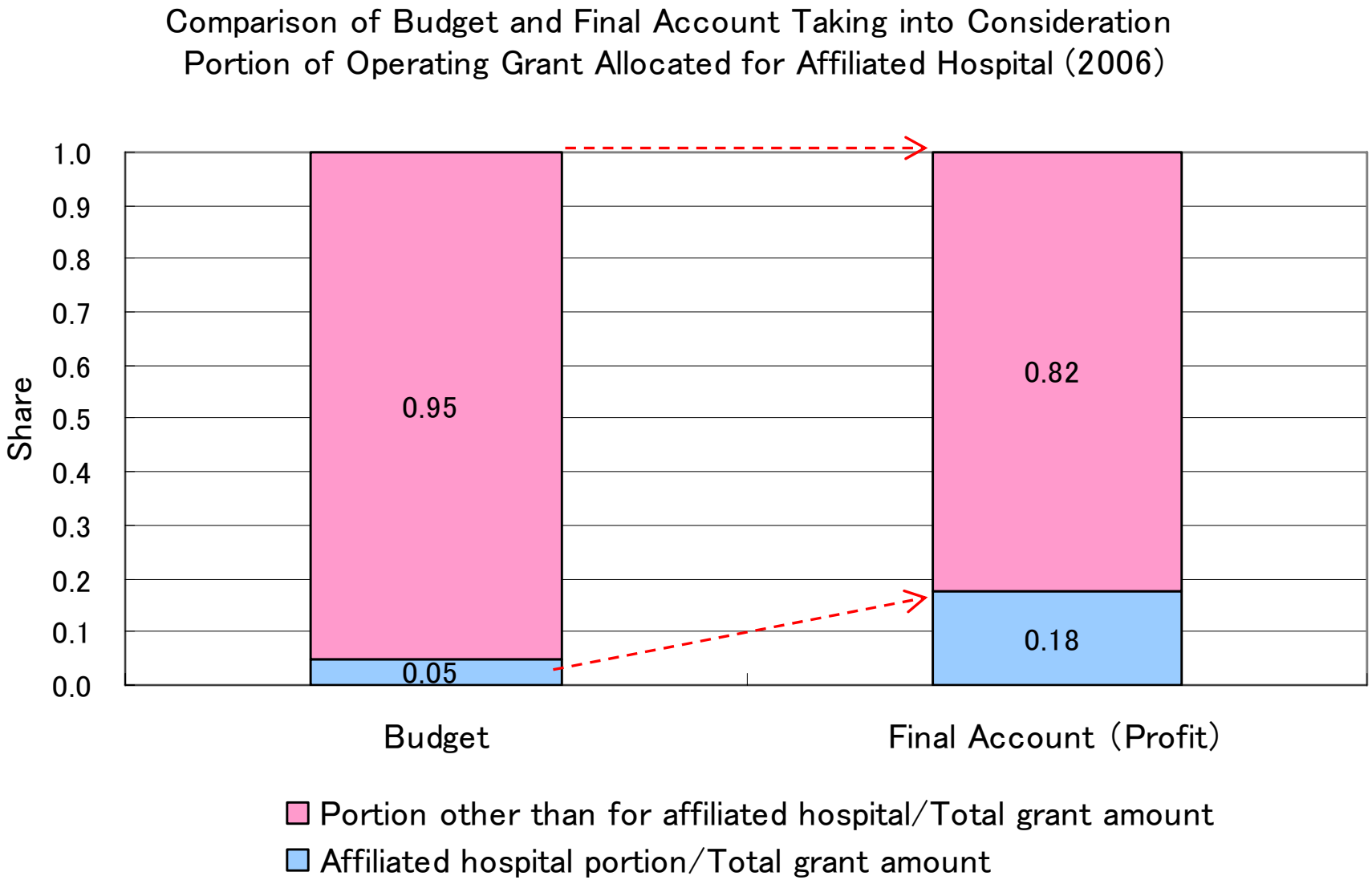
・ Income of affiliated hospital = Income of affiliated hospital one fiscal year earlier (budget)

+ Administrative reform amount (2% of estimated amount for fiscal 2004 affiliated hospital revenue)

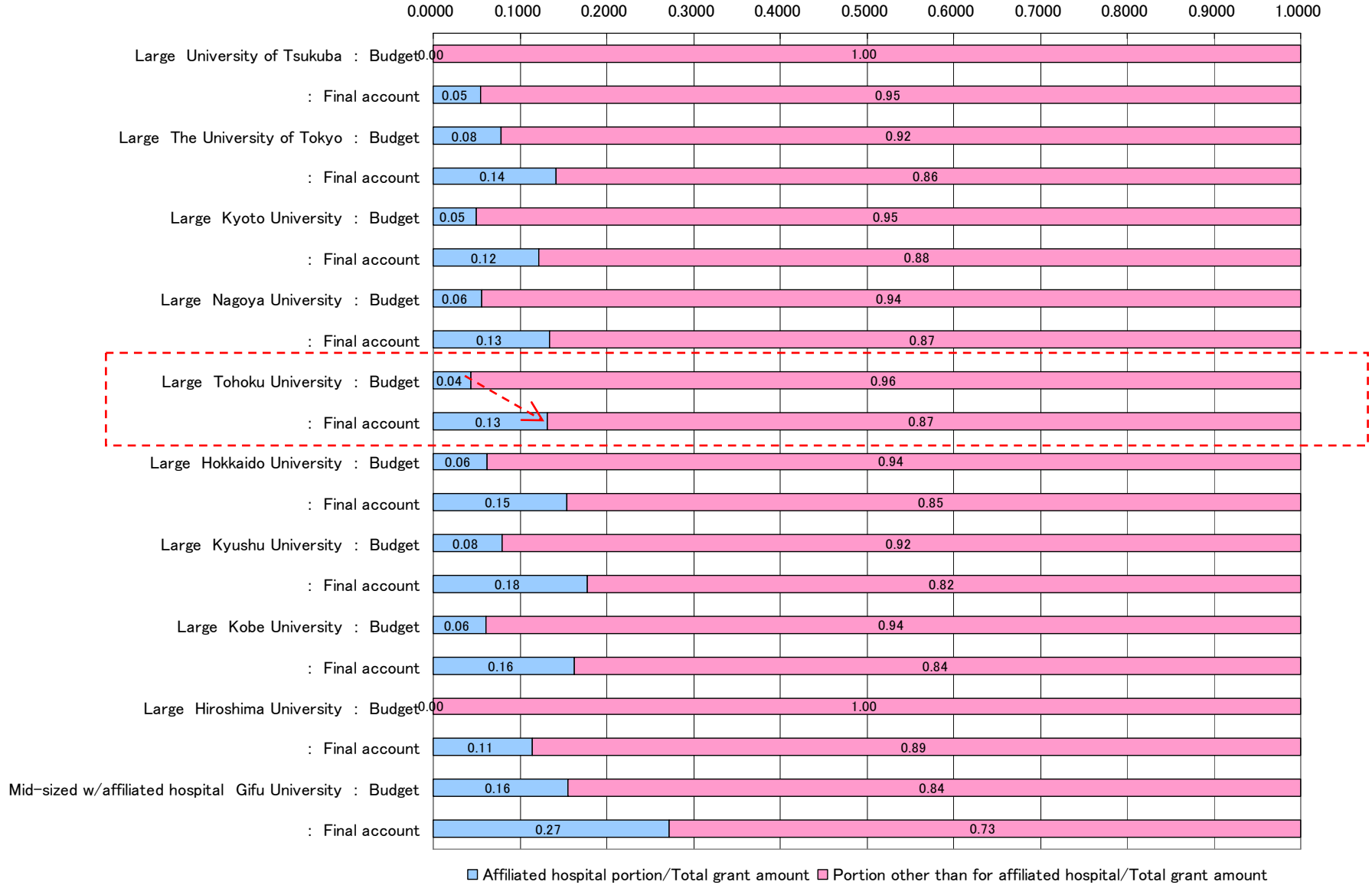
○ Affiliated hospital operating grant profit (final account)

→The results of projects carried out using operating grant obligation entrusted by the government are dissolved obligation profit.

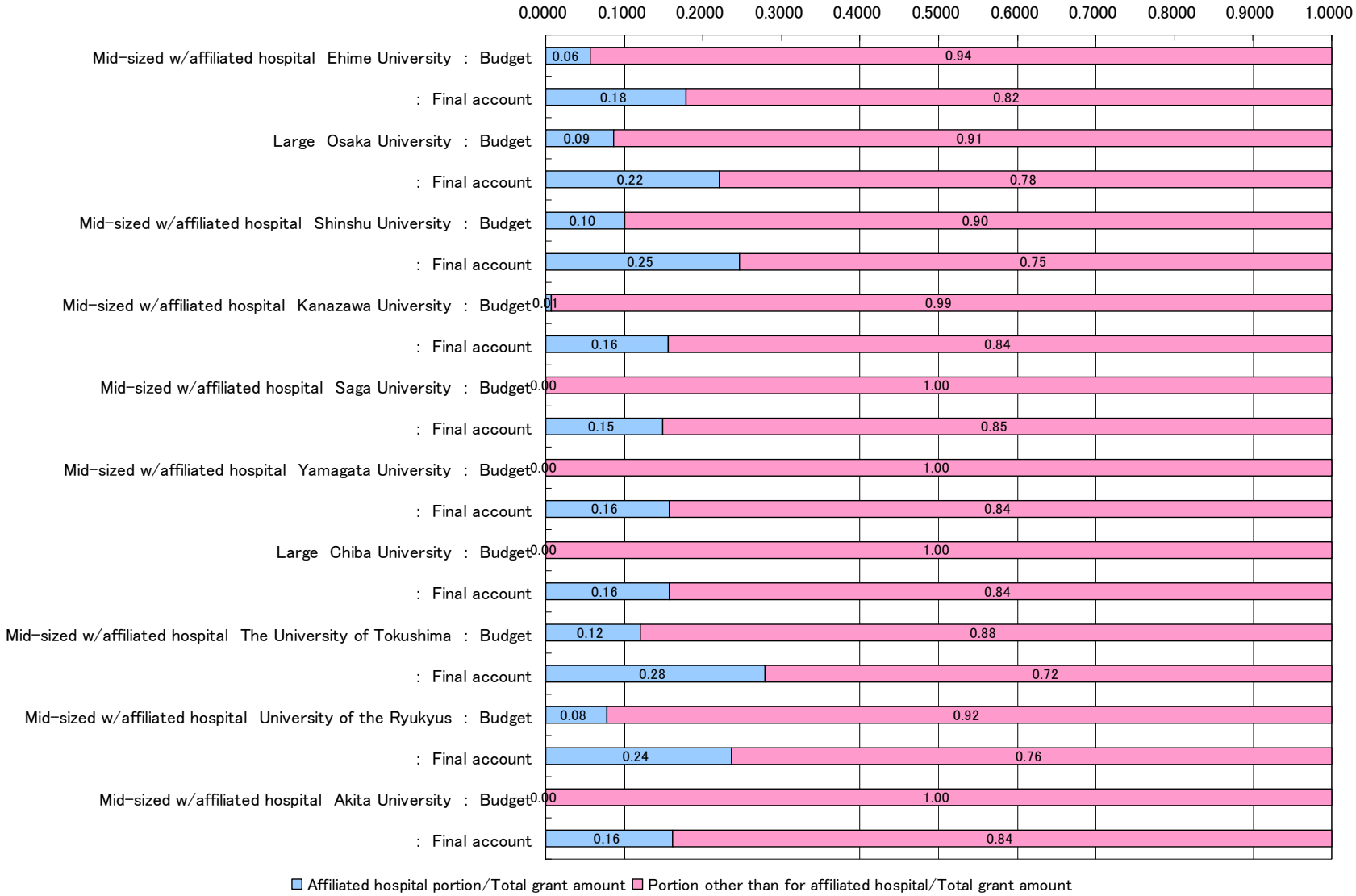
Affiliated hospital and other grants (macro chart)



Comparison of Operating Grant Budget and Final Account for Affiliated Hospital Portion and Non-Hospital Portion ① (2006) In ascending order of increase from budget to final account



Comparison of Operating Grant Budget and Final Account for Affiliated Hospital Portion and Non-Hospital Portion ② (2006) In ascending order of increase from budget to final account



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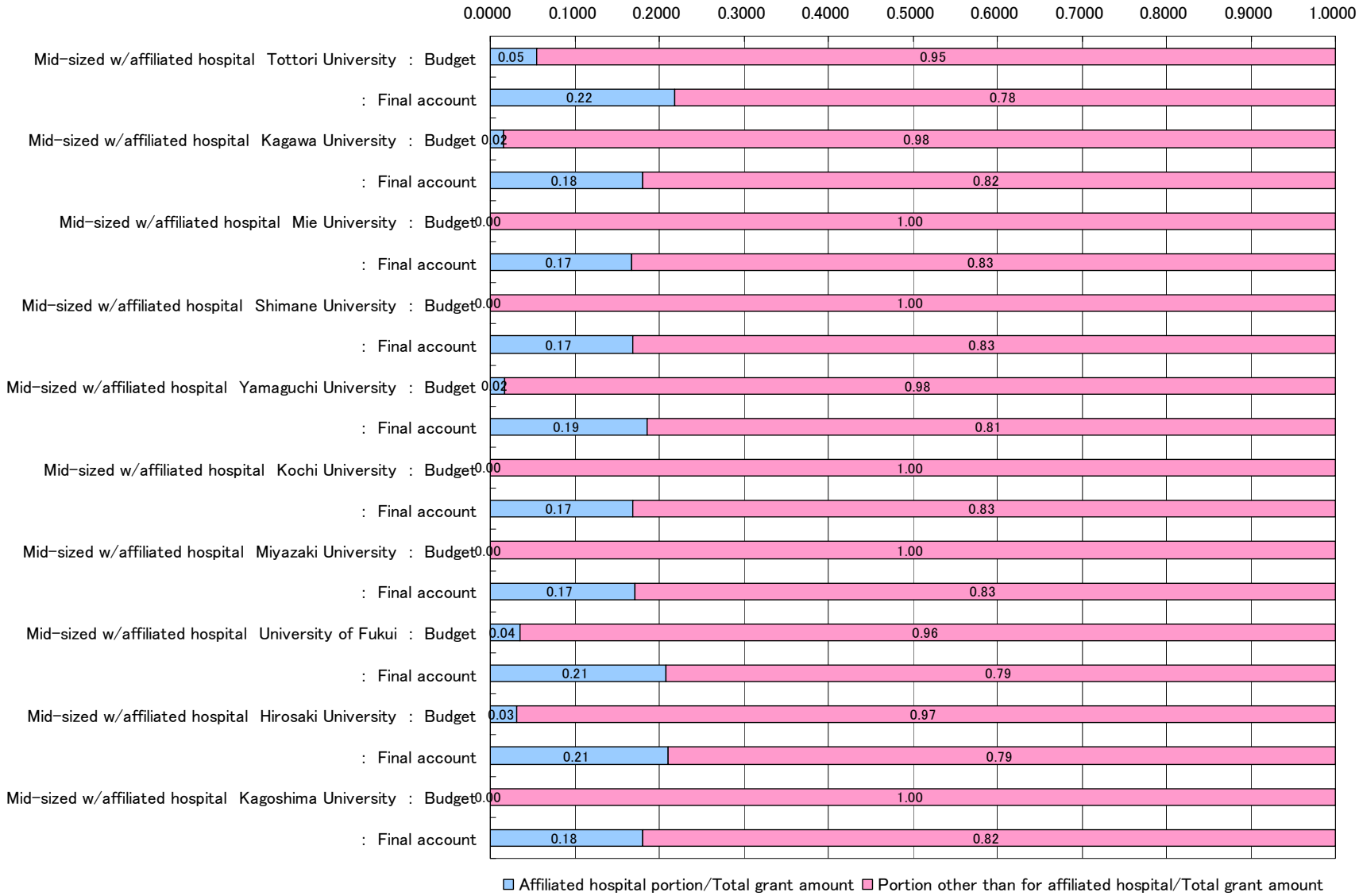
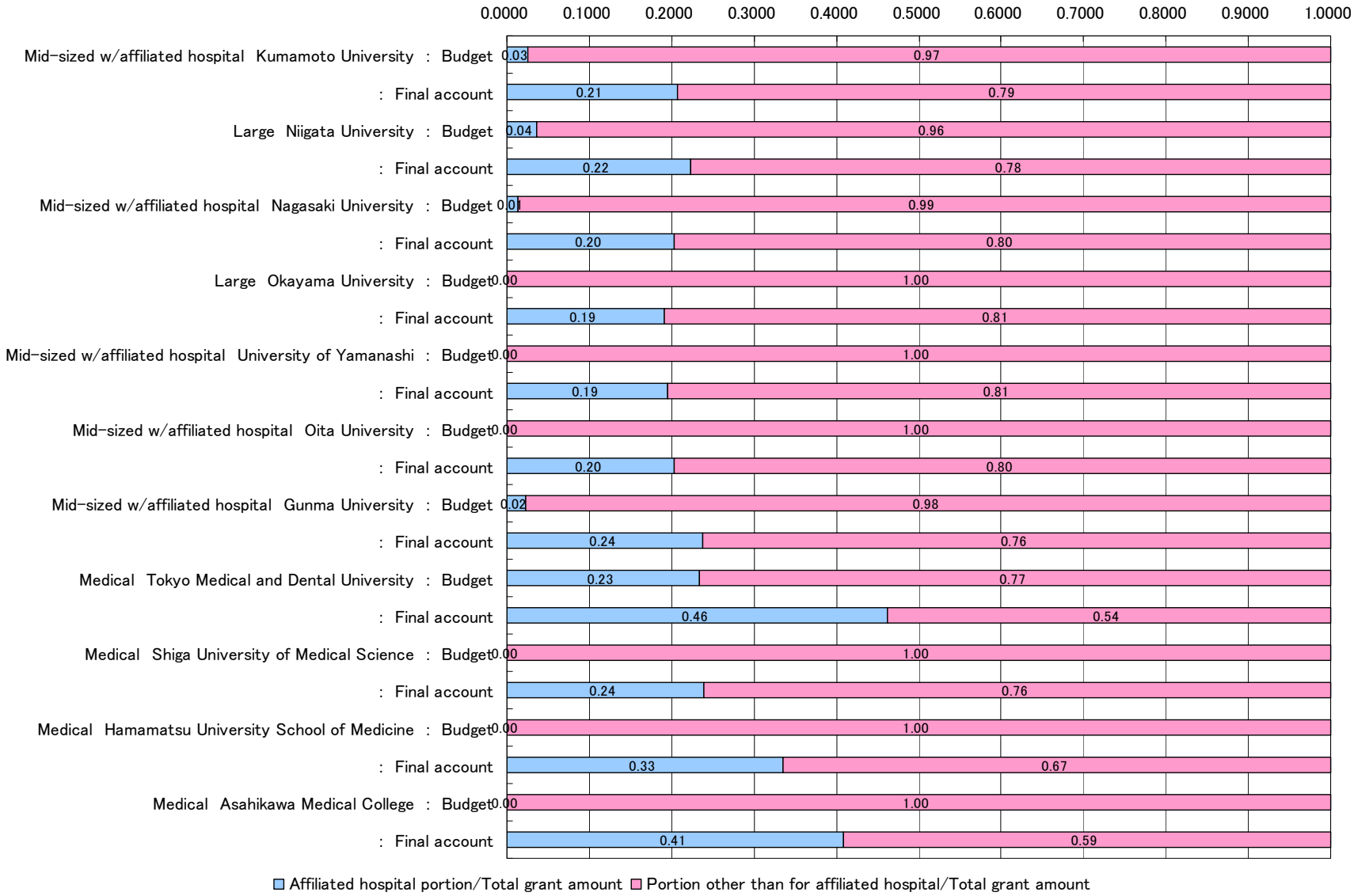


Comparison of Operating Grant Budget and Final Account for Affiliated Hospital Portion and Non-Hospital Portion ④ (2006) In ascending order of increase from budget to final account



Summary of Comparison of Grants Taking into Account Affiliated Hospitals

- **Macro: Comparing the budget and final account for grants, affiliated hospital grant (budget) < affiliated hospital grant profit (final account)**

- **Micro: Budget < Final account in the approximate order of Large < Mid-sized with affiliated hospital < Medical universities. For single-department medical universities, the difference between the amount allocated and the amount that became income is large.**

→Because hospital related expenditures (personnel expenditures, educational/research expenditures) included in the basic grant (budget) are included in the operating grant income for affiliated hospitals, it is not possible to simply compare the budget and final account.

→ Adjustment for accounting differences requires increased transparency of contents.

Consideration of Changes in Affiliated Hospital Income

In calculation of grants, a 2% increase in income is assumed -> Verify!

Affiliated hospital profit (PL)

→ Profit defined as receivables from providing medical care（because treatment from April to March is reported, this includes insurance claims that will be collected the following fiscal year).

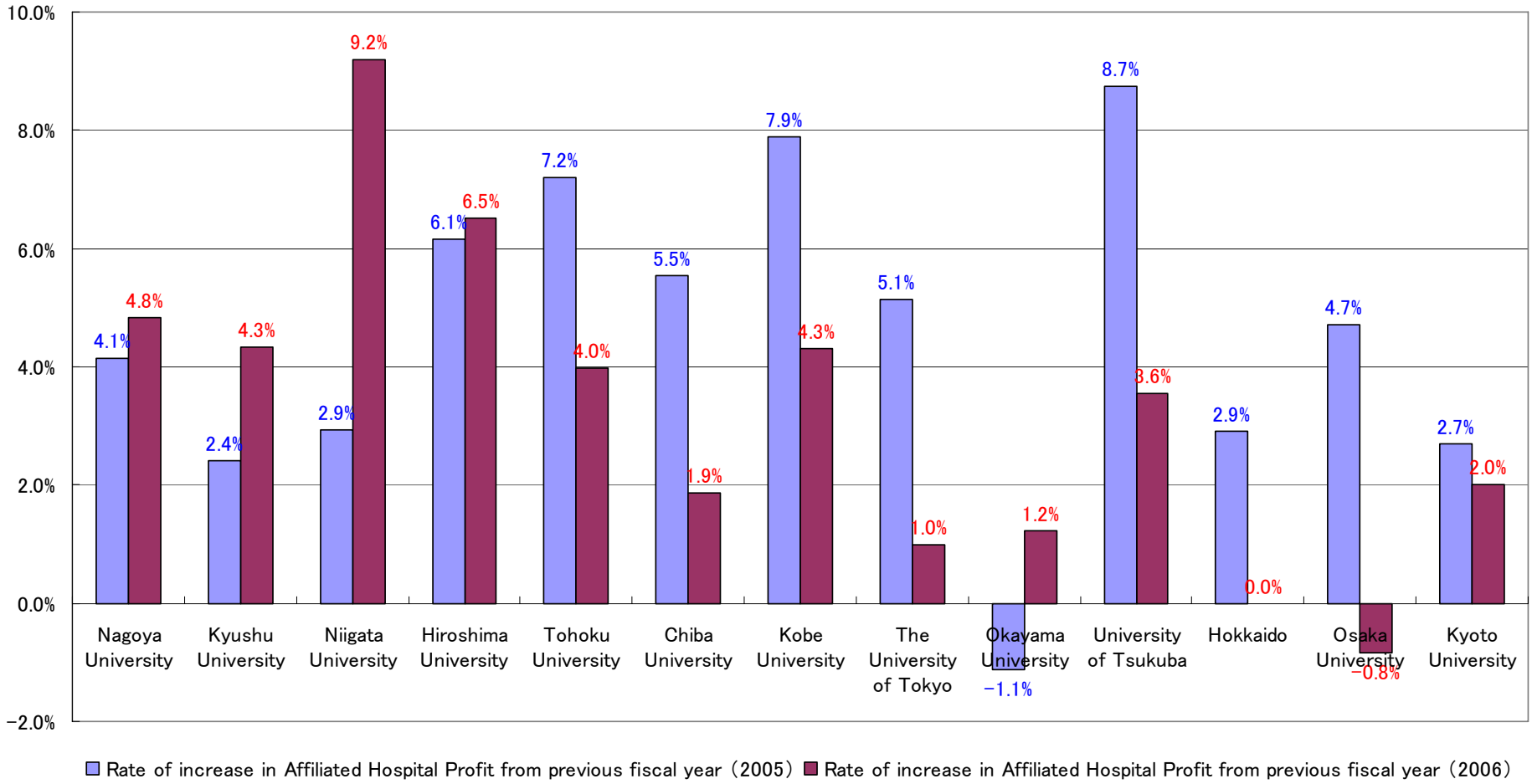
Affiliated hospital income (cash flow statement)

→ Indicates how much funding was attained through affiliated hospital affairs.

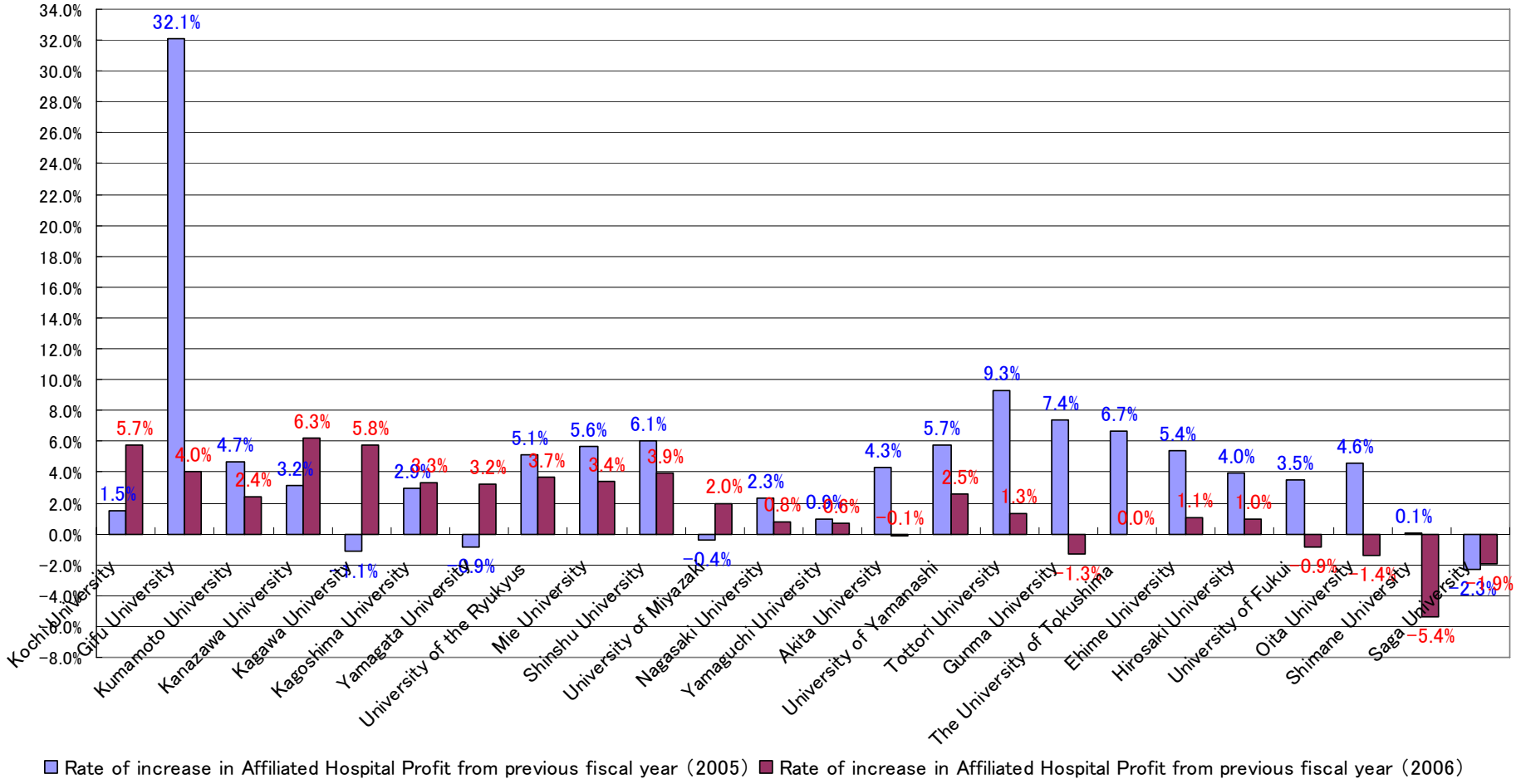
◎ Below, the amount of affiliated hospital profit is analysed as a final amount.

◎ Important to note that income ≠ profit .

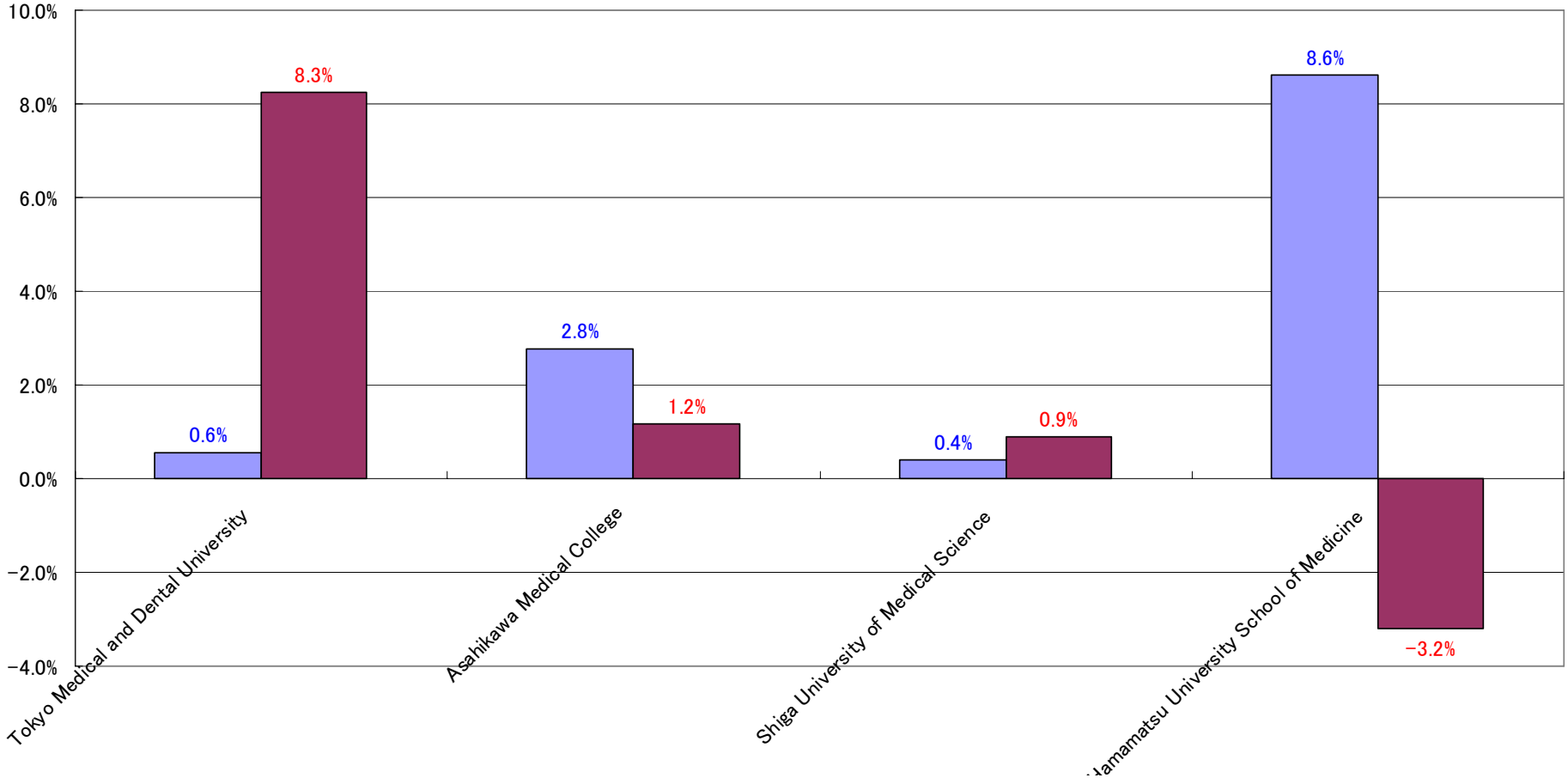
Percent Change from Previous Fiscal Year for Affiliated Hospital Profit
(Large universities)



Percent Change from Previous Fiscal Year for Affiliated Hospital Profit
(Mid-sized universities with affiliated hospital)



Percent Change from Previous Fiscal Year for Affiliated Hospital Profit
(Medical universities)



Summary of Percent Change from Previous Fiscal Year of Affiliated Hospital Profit

- **Looking at the percent change from the previous fiscal year in affiliated hospital profit, we see that most universities are achieving over 2% growth.**
- **Depending on the university, some achieve over 2% growth two years in a row. However, some cannot maintain growth in consecutive years, while others actually reverse growth.**

◎ The incentives for 2% increase in income is working.

◎ There is a need to clarify the basis and handling of accounting for this 2%.

◎ However, expenditures are increasing along with the increase in income (increase in medical services provision) and it is not clear whether or not management efficiency is improving.

Consideration of Changes in Medical Service Expenditure

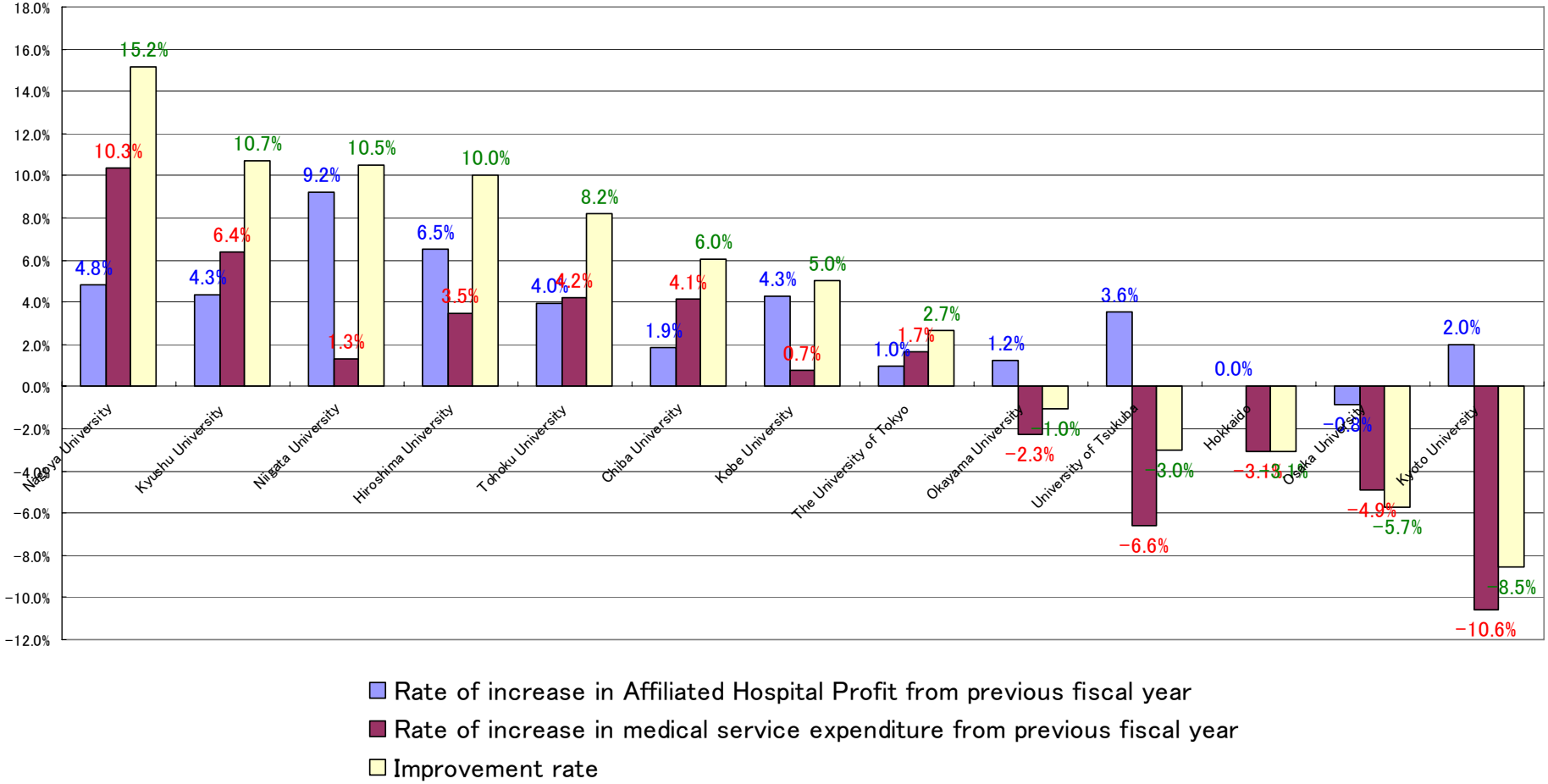
In calculation of grants, assumed to be same amount as previous year
⇒Verify!

General medical service expenditures（budget）(used in calculation of grants)

Medical service expenditure (final account）
Different concepts.

⇒◎ Below, changes in the amount of medical service expenditure is analysed.

Percent Change from Previous Fiscal Year for Affiliated Hospital Profit and Physician Expenditure and Rate of Improvement (Large universities, 2006)

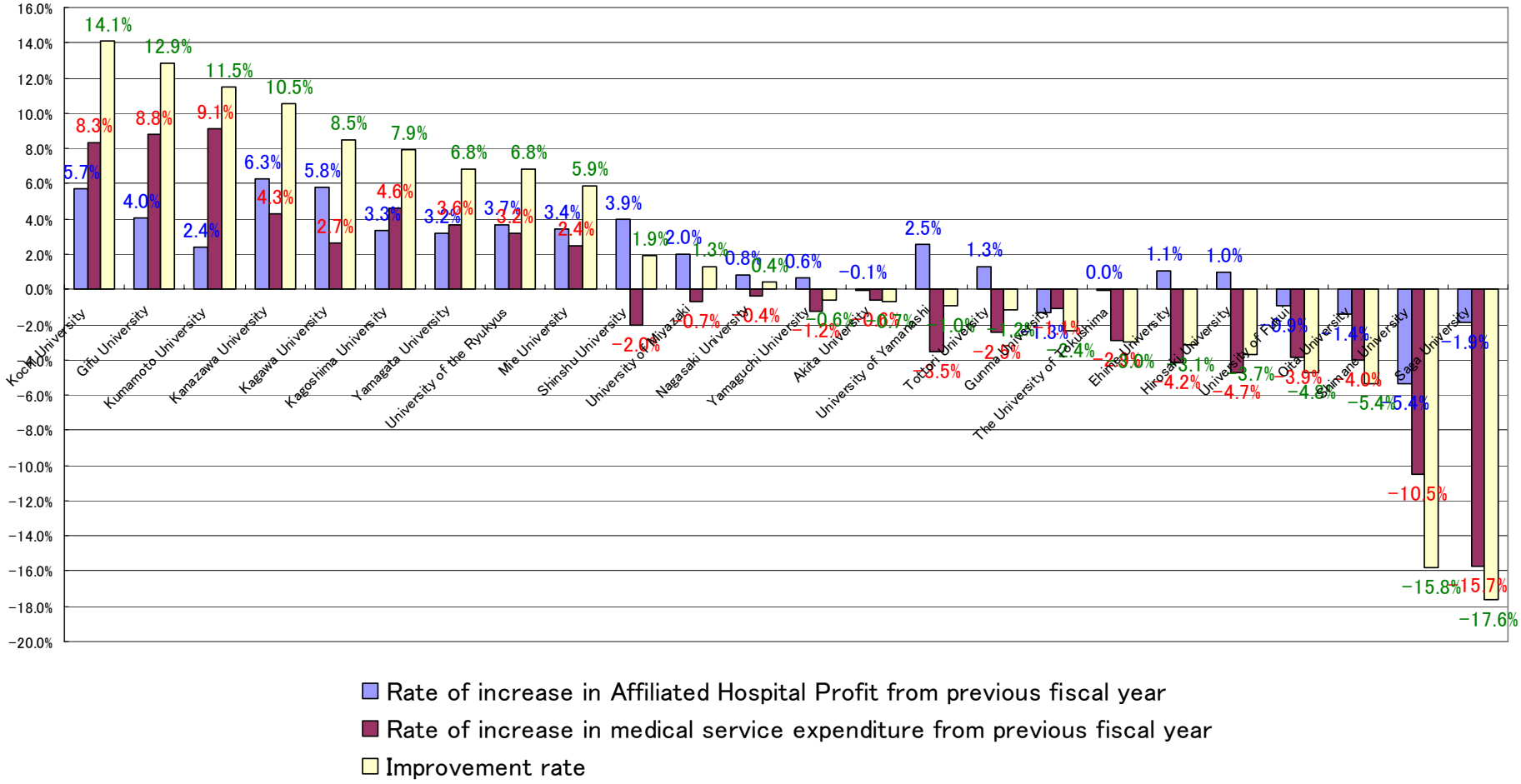


Rate of increase in Affiliated Hospital Profit from previous fiscal year

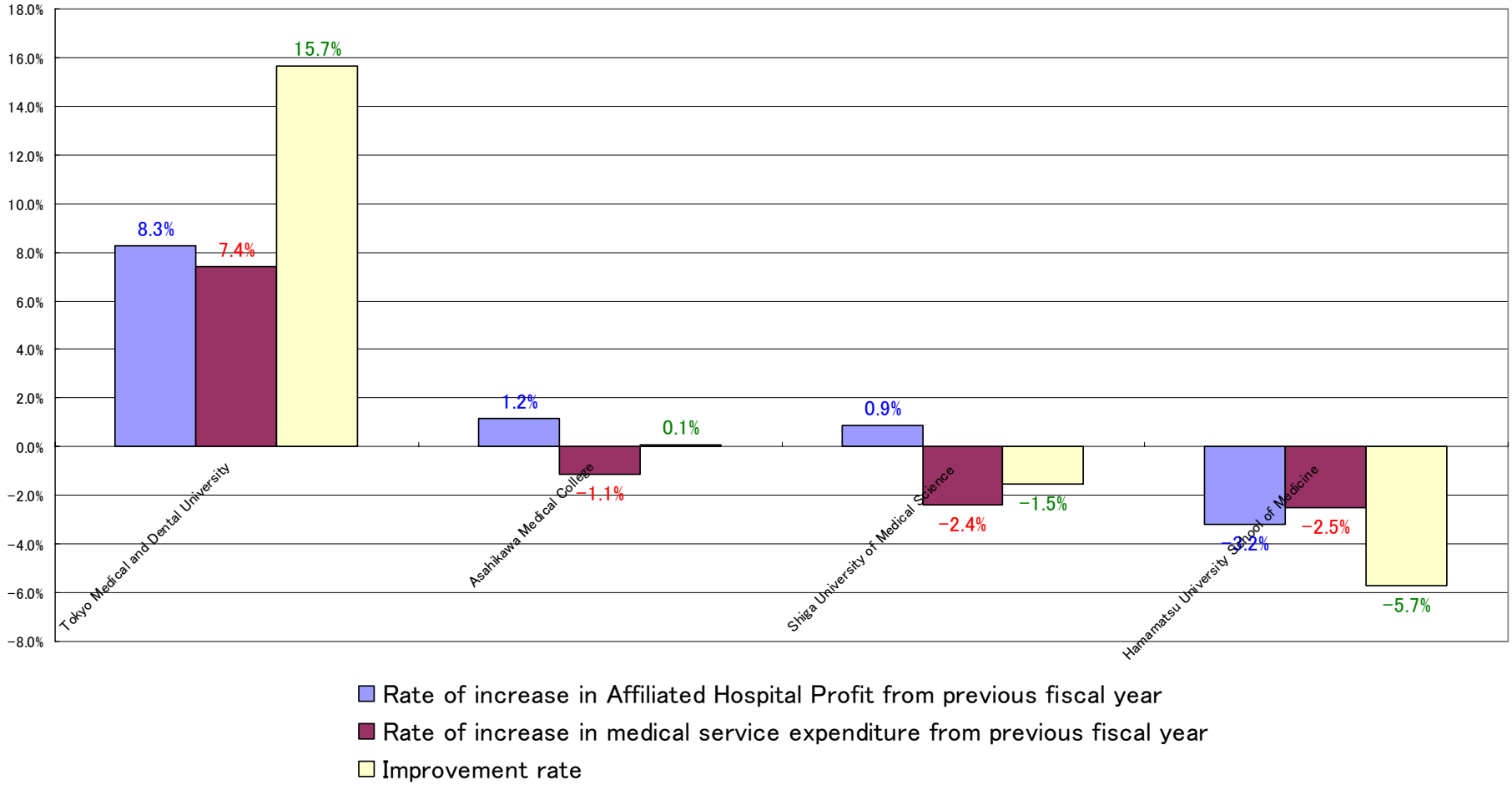
Rate of increase in medical service expenditure from previous fiscal year

Improvement rate

Percent Change from Previous Fiscal Year for Affiliated Hospital Profit and Physician Expenditure and Rate of Improvement (Mid-sized universities with affiliated hospital, 2006)



Percent Change from Previous Fiscal Year for Affiliated Hospital Profit and Physician Expenditure and Rate of Improvement (Medical universities, 2006)



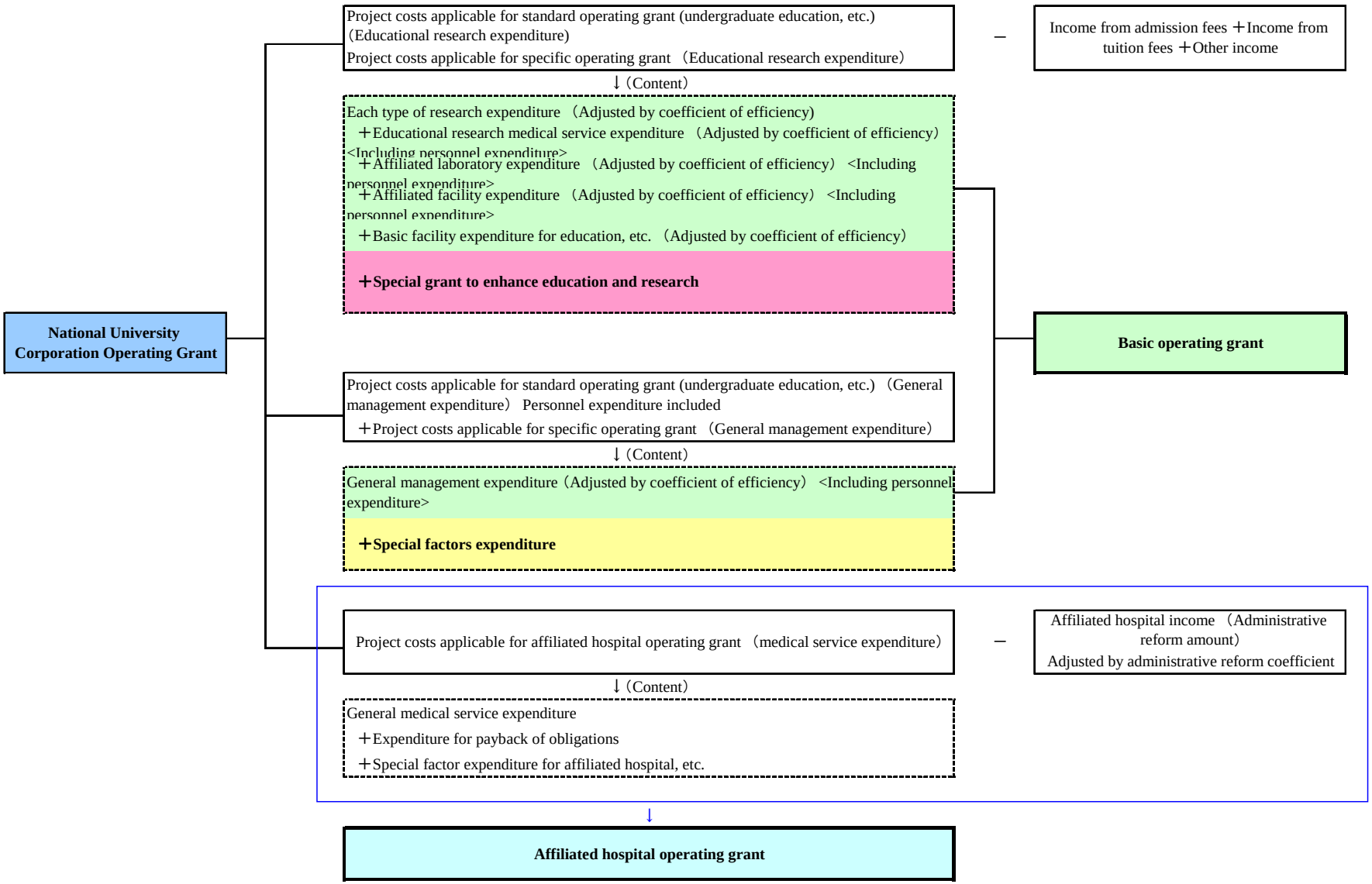
Summary of Percent Change from Previous Fiscal Year of Affiliated Hospital Profit and Medical Service Expenditure

- **Although affiliated hospital profit is increasing for virtually all universities, there is wide dispersion in increases and decreases in medical care expenditure.**
- **It is possible that gaps in the management status of university hospitals are appearing as a result of each university's local circumstances.**

- **Summary (Overall)**
- **Assumptions made in budget calculations (fixed expenditure, 2% increase in income) are not necessarily being met.**
- **＝＞ There is a need for ingenuity in budget calculation in the future.**

◎ Operating Grant Allocation

Mechanism for grant calculation



◎ Special grant to enhance education and research

- **Competitive portion of operating grants（6～7%）**
- **Allocation according to an application and review method.**
- **Overview of fiscal 2007**
- **Purpose：To provide focused support to ambitious efforts tailored to the individual nature of each university of other educational institution that meet the needs of new educational research.**
- **Estimated amount：approx. ¥84.5 billion (¥84.488 billion)**
  （80.049 in previous fiscal year）
- **Portion for continuing projects：¥60.788 billion**
- **Portion for new projects: ¥23.710 billion**
- **70% of the total amount goes to continuing projects**

(2) Analysis of factors for decisions on operating grants

(1): Are operating grants determined according to the number of faculty members or the number of students in a university?

→ In general, they seem to be determined according to the number of faculty members.

(2): What are the factors for decisions on the competitive portion and Special grant to enhance education and research?

(3): Are there other relationships with operating grants?

→ In terms of a substitution relationship, one could probably describe the allocation as emphasizing equitability.

◎ Students or faculty?
Case 1: Without corporate dummy

- **Target of analysis：85 national university corporations, 2004-2006**
- **Data： Taken from "Financial Analysis of All National Universities in Japan. "Jibu et al. 1st Policy-Oriented Research Group, National Institute of Science and Technology Policy (NISTEP), Ministry of Education, Culture, Sports, Science and Technology (MEXT). (Jan. 2008)**

○ Explained variable: Operating budget

Basic portion; competitive portion, total amount

○ Explanatory variable: number of faculty members or number of students

Case (2) With Corporate Dummy

○ Corporate dummy variable

D1：Large universities （13 corporations）

D2：Mid-sized universities with affiliated hospital（24 corporations）

D3：Medical universities （4 corporations）

D4：Mid-sized universities without affiliated hospital（9 corporations）

D5：Science and engineering focused universities （13 corporations）

D6：Liberal arts focused universities （7 corporations）

D7：Education universities （11 corporations）

D8：Institutes for graduate study （4 corporations）

- Refer to "Financial Analysis of All National Universities in Japan" for information on corporation types.

Result: Case 1 Without Corporate Dummy

Basic portion		
	Coefficient	P-value
Constant	-1812263125	0.000***
No. of faculty	16197385	0.000***
Adjusted R-squared	0.9594	

Basic portion		
	Coefficient	P-value
Constant	-3020000000	0.000***
No. of students	1807811	0.000***
Adjusted R-squared	0.7587	

Competitive portion		
	Coefficient	P-value
Constant	-174000000	0.000***
No. of faculty	807560	0.000***
Adjusted R-squared	0.7561	

Competitive portion		
	Coefficient	P-value
Constant	-200000000	0.000***
No. of students	85586.05	0.000***
Adjusted R-squared	0.5386	

Operating grant		
	Coefficient	P-value
Constant	-2680000000	0.000***
No. of faculty	20674399	0.000***
Adjusted R-squared	0.9557	

Operating grant		
	Coefficient	P-value
Constant	-4140000000	0.000***
No. of students	2296682	0.000***
Adjusted R-squared	0.7487	

***,**, * means significant at the 1, 5 and 10 percent levels, respectively.

Result: Case 2 With Corporate Dummy

Case (1) Number of Faculty

	Basic portion		Competitive portion		Operating grant	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Constant	-490000000	0.1092	-68168921	0.1603	-922000000	0.0263
NT*DU1	16087754	0.000***	798268	0.000***	20498245	0.000***
NT*DU2	12911182	0.000***	571155	0.000***	16603779	0.000***
NT*DU3	18116126	0.000***	984303	0.000***	26445043	0.000***
NT*DU4	11432650	0.000***	378323	0.006***	14144718	0.000***
NT*DU5	16752684	0.000***	642039	0.000***	19535464	0.000***
NT*DU6	12944677	0.000***	861470	0.004***	16581651	0.000***
NT*DU7	12509268	0.000***	438244	0.016**	15167262	0.000***
NT*DU8	8599485	0.000***	503366	0.124	10972447	0.000***
Adjusted R-squared	0.9716		0.7730		0.9683	

Case (2) Number of Students

	Basic portion		Competitive portion		Operating grant	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Constant	-240000000	0.7655	-26150258	0.7041	-591000000	0.5707
NS*DU1	1845986	0.000***	87494	0.000***	2347098	0.000***
NS*DU2	1284101	0.000***	54048	0.000***	1653597	0.000***
NS*DU3	4577797	0.000***	228047	0.007***	6731530	0.000***
NS*DU4	784576	0.000***	21889	0.100	968171	0.000***
NS*DU5	1319642	0.000***	47421	0.008***	1551632	0.000***
NS*DU6	721467	0.011**	41786	0.086*	926034	0.012**
NS*DU7	873530	0.000***	24044	0.194	1057481	0.000***
NS*DU8	5343513	0.008***	240895	0.162	6437983	0.013**
Adjusted R-squared	0.8348		0.6158		0.8302	

***,**, * means significant at the 1, 5 and 10 percent levels, respectively.

Summary of Results of Analysis

Result: Case without dummy

◎ In all estimates, both the number of faculty and the number of students had a significant positive relationship.

◎ “Basic portion,” “competitive portion,” “total amount”

There was a relatively strong relationship for “basic portion”

◎ Number of faculty or Number of students

There was a relatively strong relationship for “number of faculty”

Result：Case 2 with dummy

◎ Essentially the same trend

◎ Efficient or Equitable?

Factors determining grant content: substitute, complementary relationship

◎ Factors determining Special grant to enhance education and research (competitive)

Case	Explained variable	Explanatory variable of interest
1	Special educational research expenditure	Special educational research expenditure for previous fiscal year
2	Special educational research expenditure per faculty member	Special educational research expenditure per faculty member for previous fiscal year
3	Special educational research expenditure per student	Special educational research expenditure per student for previous fiscal year

Other explanatory variables are breakdown of operating grant, basic grant, affiliated hospital, and special factors. Target of analysis: 85 national university corporations from 2004 to 2005.

Results

Special grant to enhance education and research		
	Coefficient	P-value
Constant	10800000000	0.000***
Basic portion	-0.9356	0.000***
Affiliated hospital expenditure	-0.0030	0.986
Special factors expenditure	-0.1261	0.015**
Special educational research expenditure (-1)	-0.5454	0.000***
Adjusted R-squared	0.9614	

Special grant to enhance education and research/No. of faculty		
	Coefficient	P-value
Constant	1514674	0.000***
Basic portion/No. of faculty	-0.0388	0.171
Affiliated hospital expenditure/No. of faculty	-0.0730	0.781
Special factors expenditure/No. of faculty	-0.0315	0.115
Special educational research expenditure(-1)/No. of faculty(-1)	-0.3963	0.000***
Adjusted R-squared	0.8330	

Special grant to enhance education and research/No. of students		
	Coefficient	P-value
Constant	132157	0.003***
Basic portion/No. of students	-0.0589	0.020**
Affiliated hospital expenditure/No. of students	0.3181	0.101
Special factors expenditure/No. of students	0.1056	0.007***
Special educational research expenditure(-1)/No. of students(-1)	-0.2072	0.039**
Adjusted R-squared	0.6899	

***,**, * means significant at the 1, 5 and 10 percent levels, respectively.

Summary of Results of Analysis

- **Negative relationship with special educational expenditure of previous fiscal year**

→ Substitution relationship

→ The result: equitable allocation.

→ However, taking into consideration that the duration of research projects extends over multiple fiscal years, an analysis that considers those fiscal years is probably necessary.

(3) Conclusions

Allocation relationship of Special grant to enhance education and research（Competitive allocation portion）

◎ From the estimated result, we see that there is a mechanism that allocates expenditure this year to areas where allocation the previous year was low. In other words, it is possible that the national government has leeway in allocation of Special grant to enhance education and research and allocates funds in a given year to universities where the previous year's allocation was low (unallocated).

＝＞ As a result, expenditure is being allocated equitably. (Of course, many research projects are multi-year, and it is necessary to take this cycle into account.)

→ The truly desirable role played by Special grant to enhance education and research can be considered to be the buffer role of managing inexpediencies that arise as a result of the introduction of rules to streamline grants. It serves as a pork barrel budget.

→ Accountability is necessary to ensure the transparency of review methods and verify the results.

Special grant to enhance education and research and Existing Performance Indicators (Addendum)

Is there a relationship between allocation of Special grant to enhance education and research and performance indicators?

◇ **Explained variable**

Competitive portion of grants per student/faculty member

→ **2005 and 2006**

◇ **Explanatory variables**

Educational indicators: No. of faculty/No. of students; Educational expenditure/No. of students

Research indicators：Research expenditure/No. of faculty;（Articles in English＋Articles in Japanese）/No. of faculty;

No. of scientific research grants accepted/No. of faculty; No. of patents published/No. of faculty

Social contribution indicators：Profit from contract projects, etc. (excl. from national government)/No. of faculty;

Profit from donations/No. of faculty

→ **Financial data from each national university corporation, MEXT website, and Jibu et al., "Financial Analysis of All National Universities in Japan. " (Jan. 2008)**

Results

◎ Educational indicators

Special grant to enhance education and research/Students

	Coefficient	P-value
Constant	612000000	0.000***
No. of Faculty/No. of Students	4260000000	0.009***
Educational expenditure/No. of students	-2088395	0.002***
Adjusted R-squared	0.064	

◎Research indicators

Special grant to enhance education and research/Faculty

	Coefficient	P-value
Constant	-47184165	0.342
Research expenditure/No. of faculty	210537	0.000***
Articles in English＋Articles in Japanese/No. of faculty/No. of faculty	-253000000	0.007***
No. of scientific research grants accepted/No. of faculty	-26203207	0.524
No. of patents published/No. of faculty	126000000	0.882
Adjusted R-squared	0.348	

◎Social contribution indicators

Special grant to enhance education and research/Faculty

	Coefficient	P-value
Constant	-93197559	0.072
Profit from contract projects, etc. (excl. from national government)/No. of faculty	526	0.008***
Profit from donations/No. of faculty	438	0.000***
Adjusted R-squared	0.259	

***,**, * means significant at the 1, 5 and 10 percent levels, respectively.

Summary of Analysis Results

- **Results：**
- **For educational indicators, allocation depended on faculty more than educational expenditure.**
- **For research indicators, allocation depended on number of articles more than research expenditure.**
- **For social contribution indicators, allocation depended on contract profits and donation profits.**
- **＝＞ From these results, we are able to confirm the trends in the allocation of educational research expenditure, but it is not possible to discuss the pros and cons.**
- **There is a need for transparent discussion in future.**

(4) Remaining Topics

◎ In the future, creation of indicators will be crucial for performance-based allocation.

◎ Maintaining information for research indicators is relatively feasible, but it could also be argued that research can take place with external funds or Japan Society for the Promotion of Science funds.

＝＞ In that case, one issue is separation of educational and research expenditures.

◎ It will be necessary to maintain information for educational indicators. Evaluation of educational programs, surveys of student satisfaction levels: refer to overseas case examples.（Australia: LTPF）

◎ Maintaining information for social contribution indicators will be crucial (the key point is to grasp areas that are not reflected in research performance). ＝＞ At regional universities where research performance can be expected to be comparatively low, the question of how much social contribution indicators they possess will determine the importance of the existence of regional national universities. ＜＝ Crucial importance of maintaining information for social contribution indicators.