Research funding in Industry-University Collaborations in Japan

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Outline

1. Introduction

2. Outline of Policy for I-U Collaboration in Japan

3. Research funding and performances of I-U collaborations

4. Finding and future works

University-Industry Collaboration Policies and National University Patent

Enactment of Science and Technology Basic Law in 1995

The 1st S&T Basic Plan
"cooperation and exchanges among industrial, academic, and governmental circles"

The 2nd S&T Basic Plan
"Improvement of environment of tech-transfer from public research organizations"

The 3rd S&T Basic Plan
"Building a progressive industry-university-government collaboration system"

'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10

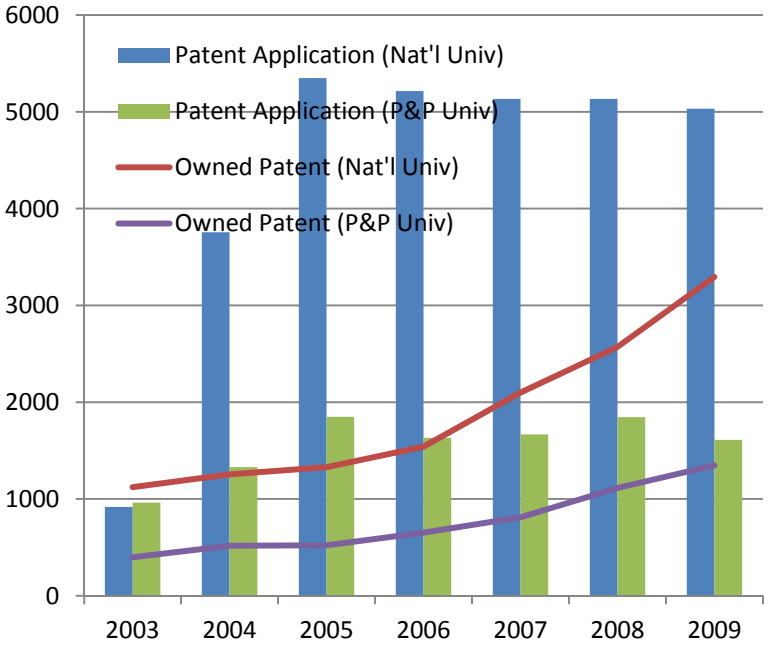
Act on the Promotion of Technology Transfer from Universities to Private Business Operators (Japanese TLO Act)	Act on Special Measures for Industrial Revitalization (Japanese Bayh-Dole Act)	Intellectual Property Basic Act	National University Corporation Act	Amendment of Basic Act on Education
Promotion of Tech Transfer from Universities via Accredited TLOs	Entrusting Patent Rights from Public Research Funds to Trustees	Promotion of Transfer of Public R&D Results to Private Firms	Turning National Universities into Independent Entities	University's New Mission: Social Contribution

- Before 2004, the patents created faculties of National Universities were owned by MEXT, and many of them were transferred/entrusted to Japan Science & Technology Agency (JST) or TLOs for Tech-Transfer.
- Japanese National Universities(JNUs) have started to own patents created by their faculties since 2004, and got involved in Tech-Transfer activities directly.

NISTEP NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY POLICY

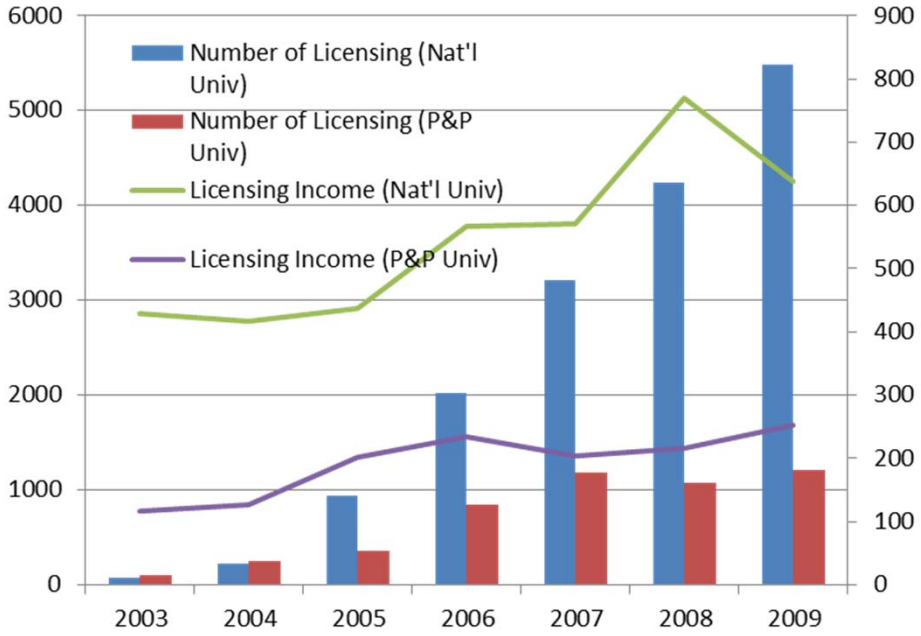
University Patents and Their Licensing

University Patent (Applied and Owned)



Source: MEXT Survey (2010)

Licensing and Income (JPY Million)

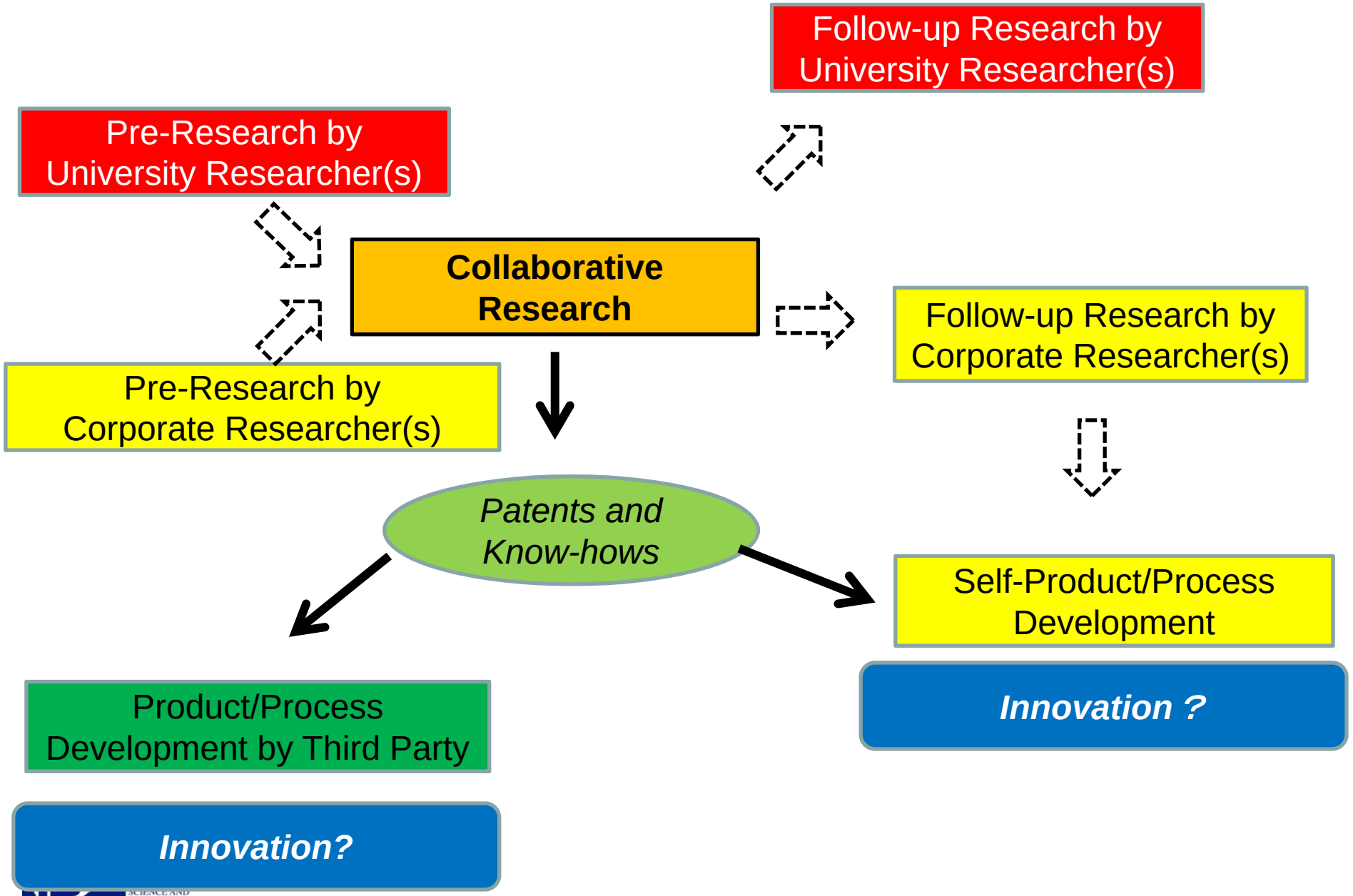


Source: MEXT Survey (2010)

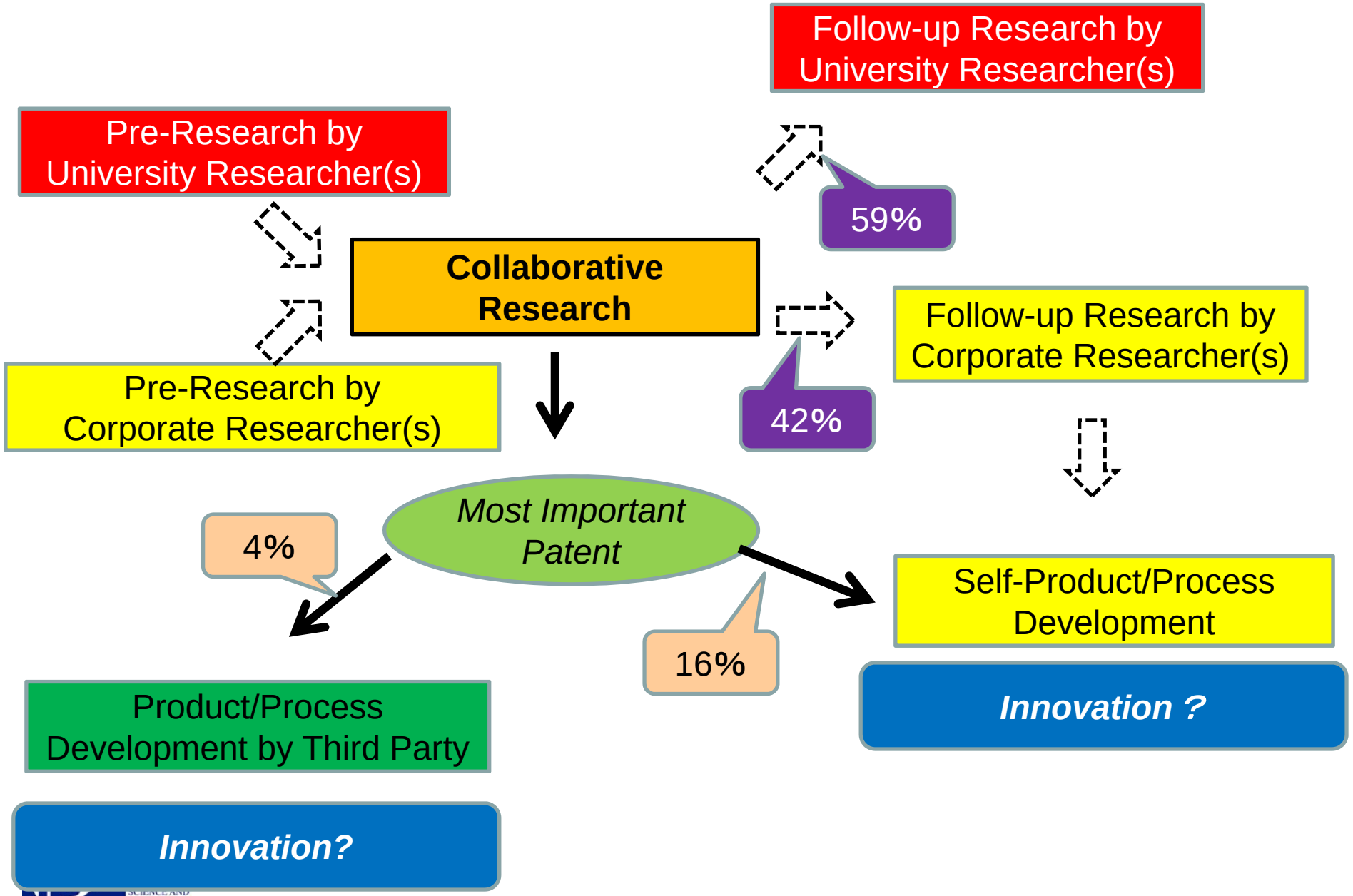
The number of patent application was rapidly increased in FY2004,
and the number of filed patents has been gradually increased in JNUs.
In addition, the number of collaborative research between university and industry have been increased.

How much extent do the outcome of university-industry collaborative research contribute to innovation creation in the firms?
There are plenty of case studies on this. But, how much is it as a whole?

Possible Flow of Collaborative Research between Industry/University



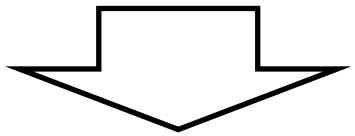
Preliminary Results on Collaborative Research Flow



Purposes of analyses on research funding using Industry-University Collaboration Survey

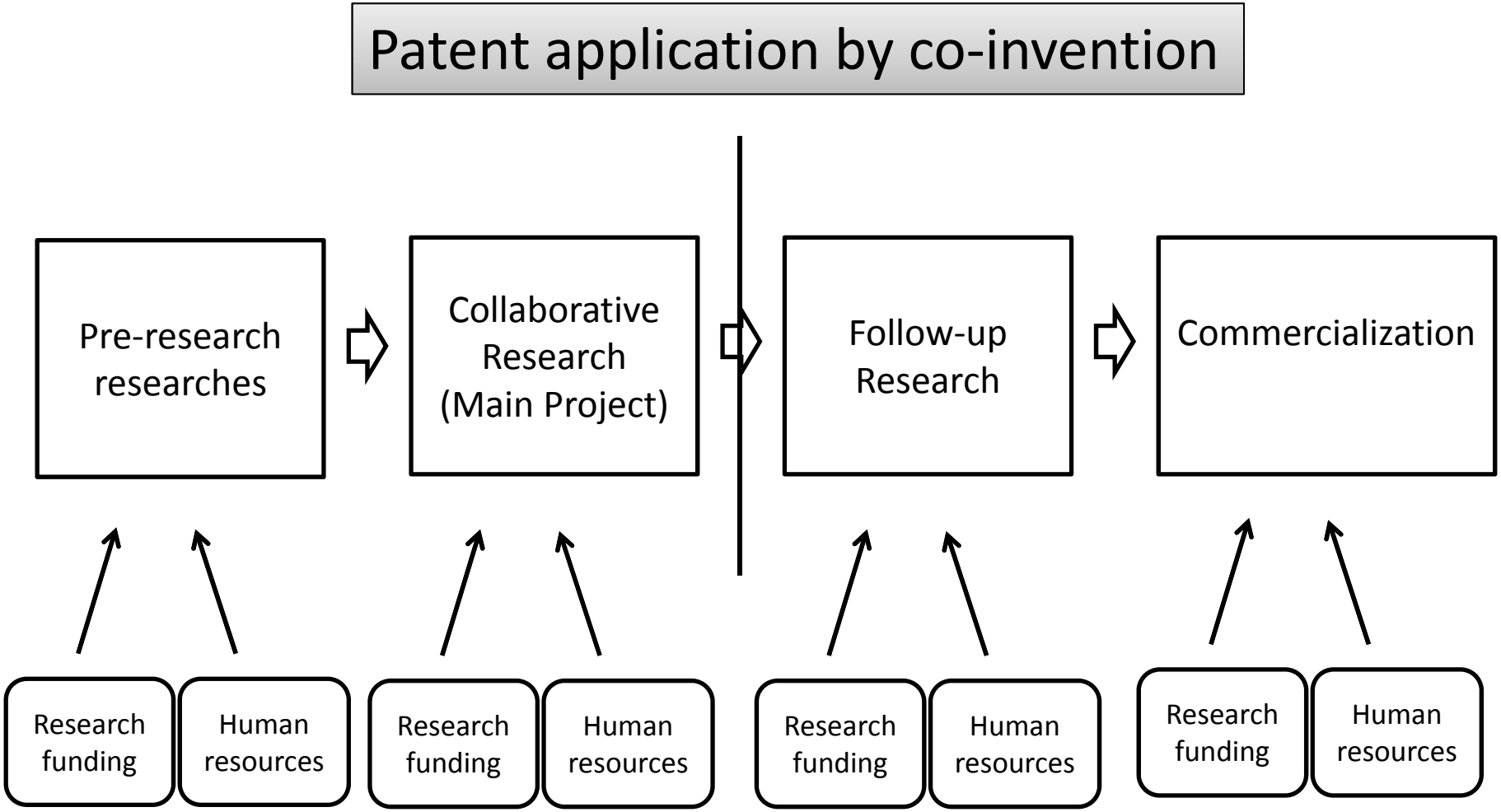
To elucidate

- Structure of inputs such as research funding into I-U collaboration projects
- Relations between variations of funding and outputs of I-U collaboration projects, and
- Relations between research funding and project management



How to input research funding into I-U collaboration projects for effective management.

Process of Industry-University collaborations



Variations of research funding in Japan

1. Organizations which project members belong to

2. Competitive funding for organizations
3. Grant in aid of JSPS
4. JST
5. NEDO
6. Other competitive funding

Competitive research grants

7. Contract based research funding
8. Local government

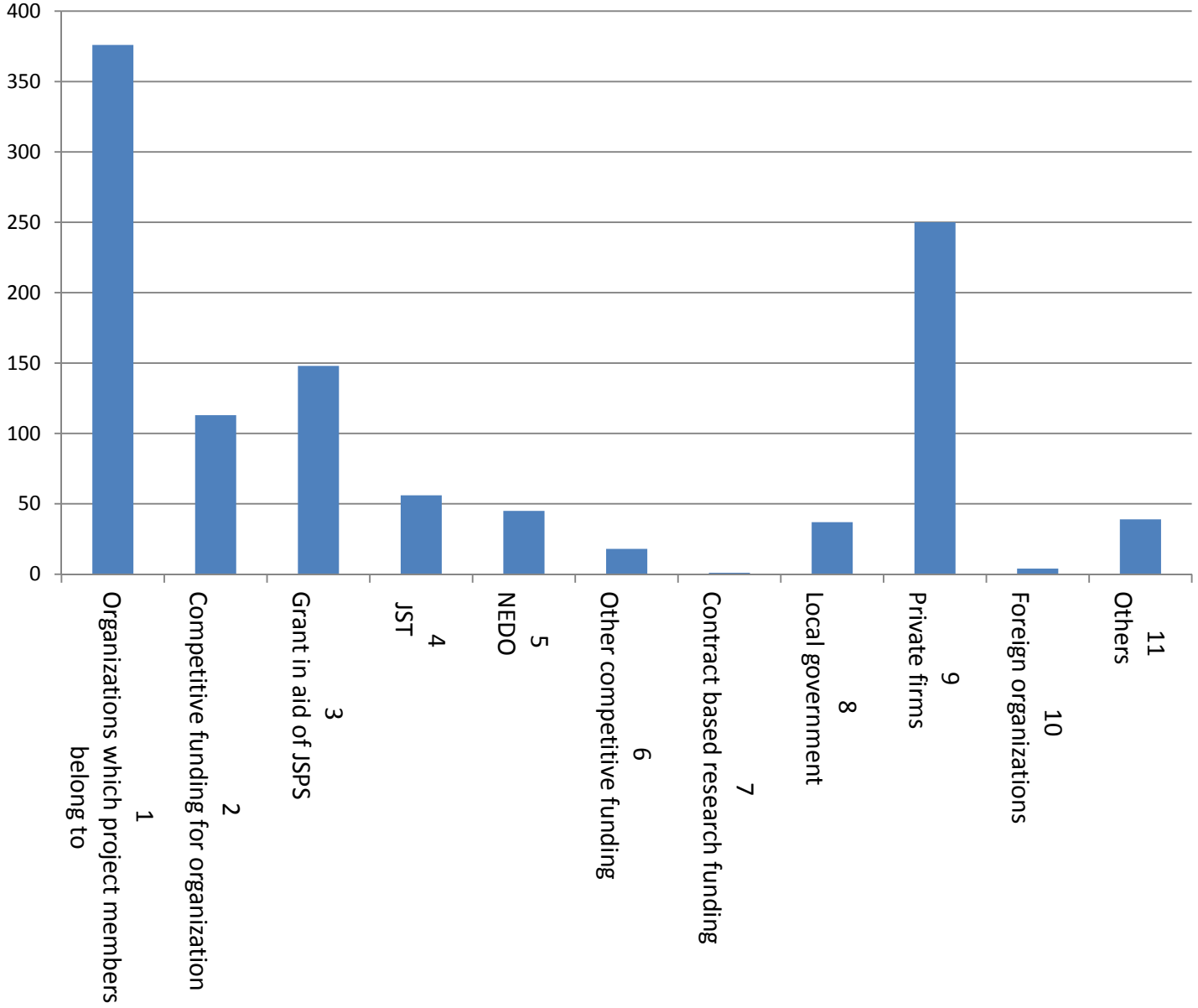
9. Private firms

10. Foreign organizations
11. Others"

Generally curiosity-driven

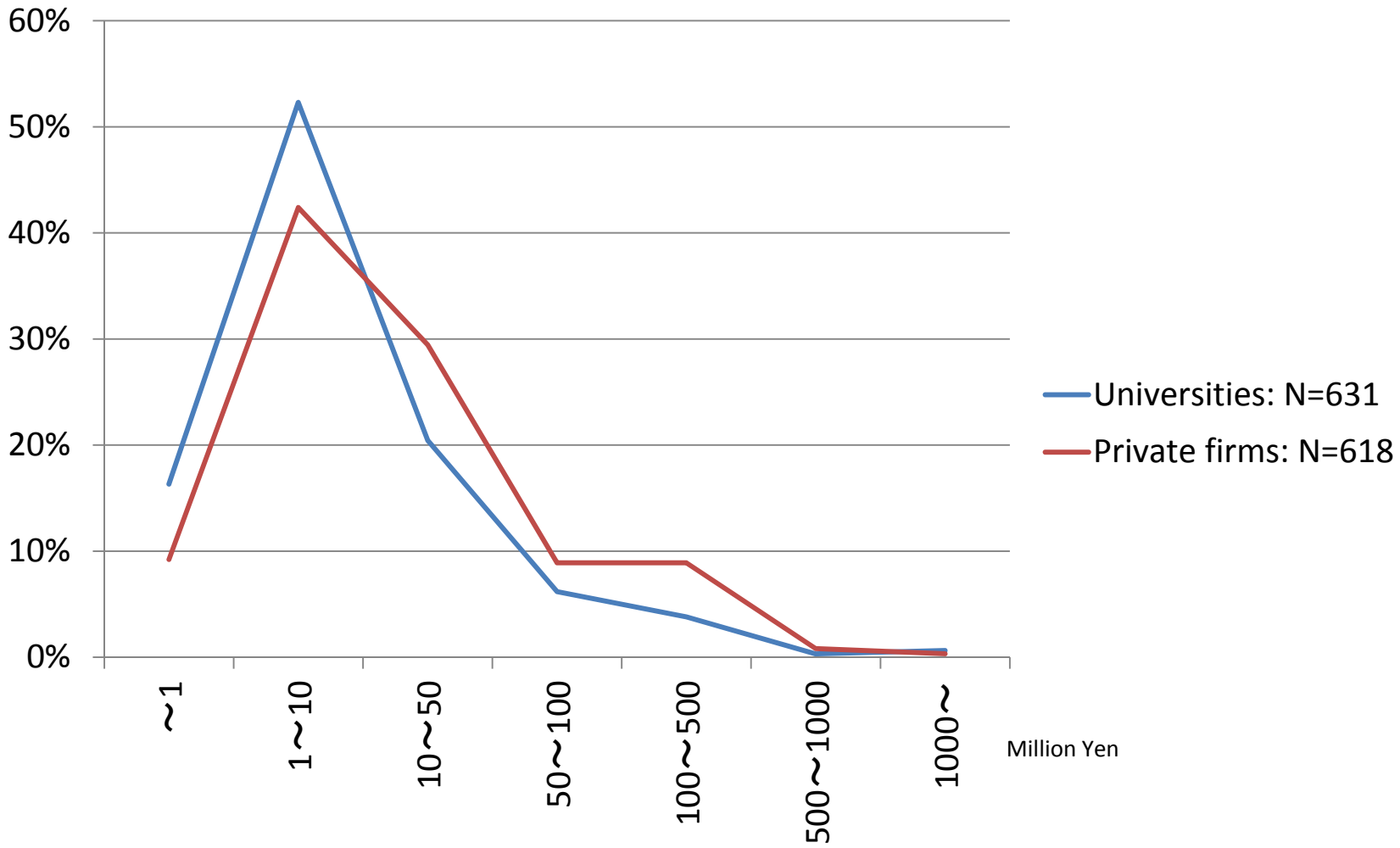
Generally mission-oriented

Funding sources of pre-researches: Universities

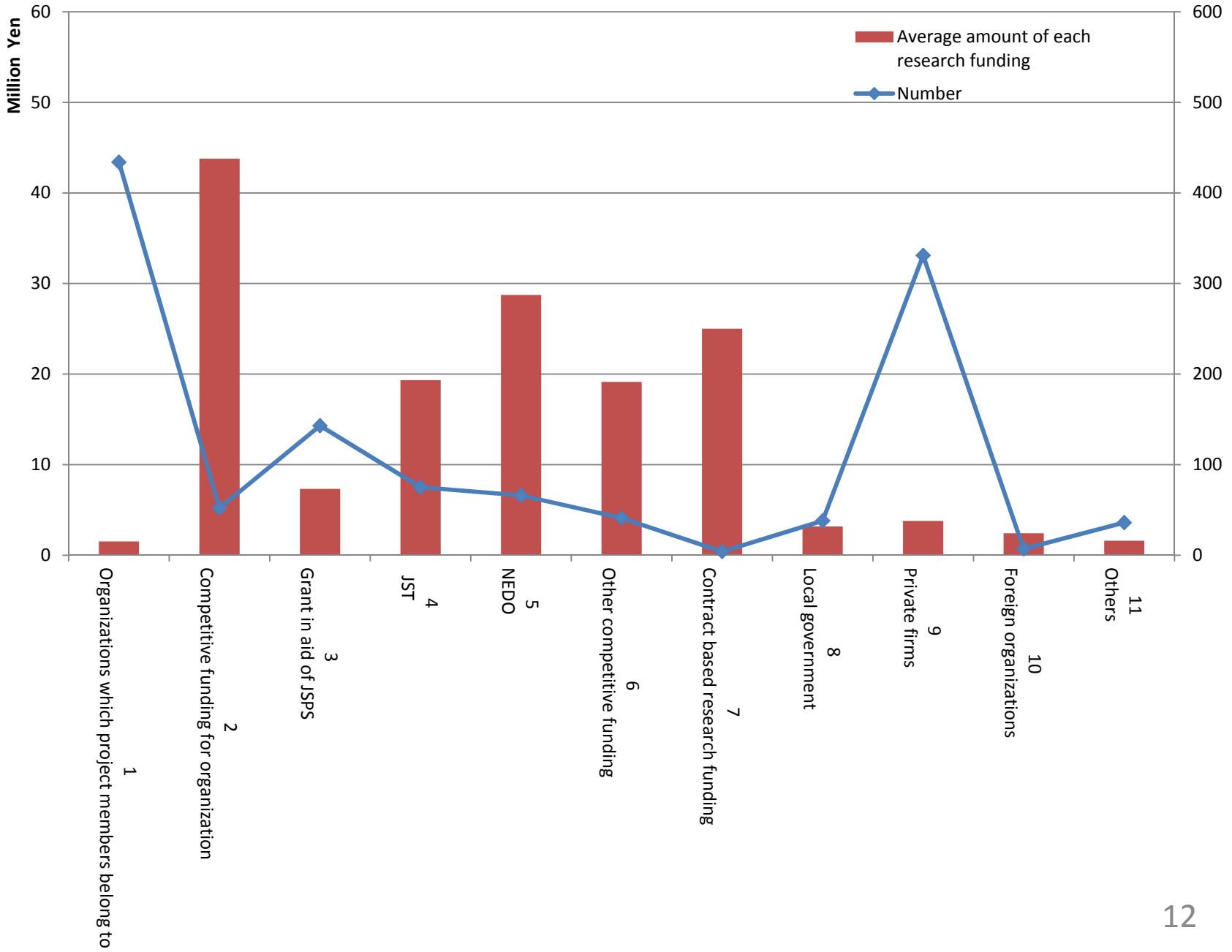


N=524

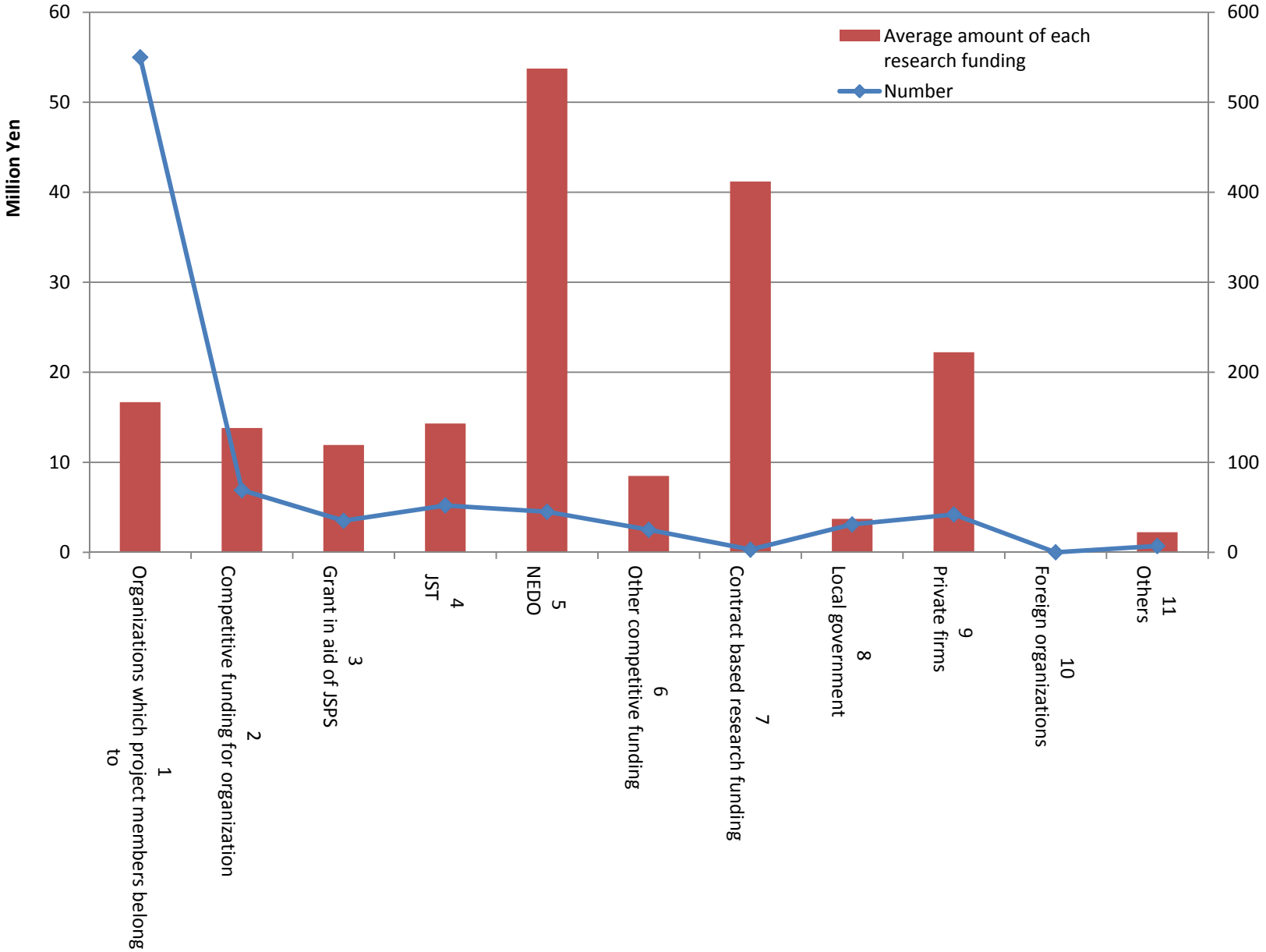
Scale of research funding of main projects of Industry-University collaborations



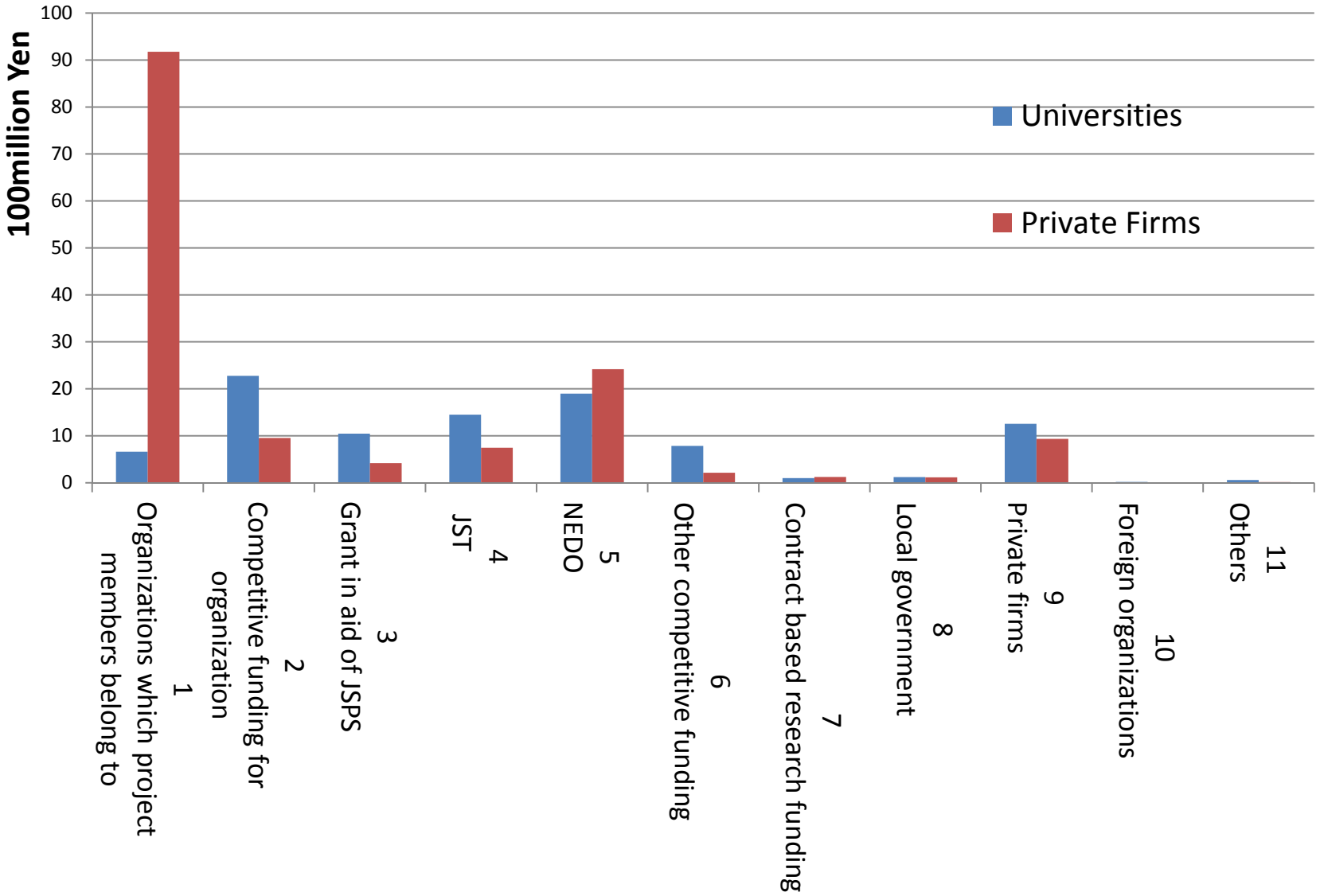
Main Projects and funding sources: Universities



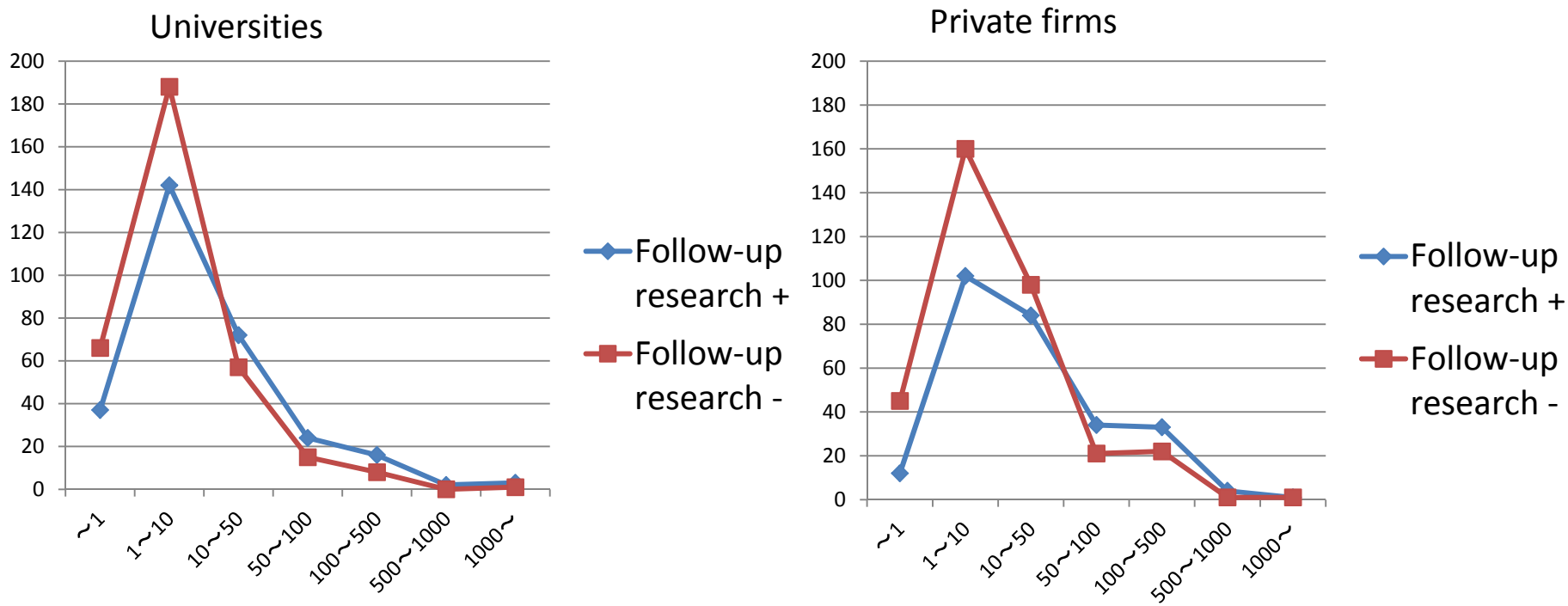
Main Projects and funding sources: Private firms



Main Projects and funding sources: Total amounts



Relations between amount of funding of main project and follow-up researches



Funding sources of main projects and follow-up researches

<Multi-funding>

	Ratio of follow-up researches: Universities	N	Ratio of follow-up researches: Private Firms	N
1 Organizations which project members belong to	46%	425	42%	556
2 Competitive funding for organization	61%	41	60%	92
3 Grant in aid of JSPS	53%	146	62%	37
4 JST	51%	79	72%	53
5 NEDO	52%	65	60%	50
6 Other competitive funding	63%	46	65%	23
7 Contract based research funding	83%	6	50%	4
8 Local government	38%	34	59%	34
9 Private firms	46%	343	38%	40
10 Foreign organizations	67%	3	—	0
11 Others	50%	34	—	0

Production of academic papers and patents by funding sources of main projects

<Multi-funding>

	Universities				Private firms	
	Academic papers in Japanese	Academic papers in English	Patent applications for JPO	Patent applications for Foreign Patent Offices	Patent applications for JPO	Patent applications for Foreign Patent Offices
1 Organizations which project members belong to	2.31	4.74	2.62	0.86	1.17	2.08
2 Competitive funding for organization	3.33	7.85	3.31	1.17	1.01	2.24
3 Grant in aid of JSPS	2.88	7.08	3.20	1.01	1.06	2.43
4 JST	2.76	8.29	3.01	1.06	2.16	2.10
5 NEDO	1.62	9.64	8.37	2.16	0.94	2.11
6 Other competitive funding	2.52	7.74	2.95	0.94	1.83	2.80
7 Contract based research funding	15.83	59.83	3.67	1.83	0.70	2.36
8 Local government	1.61	9.48	2.61	0.70	0.87	2.36
9 Private firms	2.31	4.99	2.65	0.87	1.00	1.67
10 Foreign organizations	2.50	4.00	3.00	1.00	—	—
11 Others	1.13	4.48	2.36	1.16	0.00	0.00

Matrix of funding sources between pre-researches and Collaborative Researches: Universities <Main funding>

Collaborative Researches

Pre-Researches

	1 Organizations which project members belong to	2 Competitive funding for organization	3 Grant in aid of JSPS	4 JST	5 NEDO	6 Other competitive funding	7 Contract based research funding	8 Local government	9 Private firms	10 Foreign organizations	11 Others
1 Organizations which project members belong to	86	2	4	2	6	3	1	2	42	1	2
2 Competitive funding for organization	3	22	5	3	6	1	1	0	3	0	1
3 Grant in aid of JSPS	5	2	33	3	3	4	0	3	14	0	1
4 JST	3	0	1	26	1	2	0	0	4	0	1
5 NEDO	2	2	0	1	25	0	0	0	1	0	1
6 Other competitive funding	1	0	0	1	1	11	0	1	3	0	0
7 Contract based research funding	1	0	0	0	1	1	0	0	0	0	0
8 Local government	2	0	0	1	0	1	0	5	2	0	1
9 Private firms	16	1	6	2	3	1	0	3	121	2	0
10 Foreign organizations	1	0	0	0	0	0	0	0	2	1	0
11 Others	2	1	1	0	0	0	0	0	4	0	7

Yellow: Top 30% Pink : Top10%

Matrix of funding sources between pre-researches and Collaborative Researches <Multi -funding>

Collaborative Researches

Pre-researches	1 Organizations which project members belong to	2 Competitive funding for organization	3 Grant in aid of JSPS	4 JST	5 NEDO	6 Other competitive funding	7 Contract based research funding	8 Local government	9 Private firms	10 Foreign organizations	11 Others
1 Organizations which project members belong to	304	26	91	43	26	21	3	18	193	1	24
2 Competitive funding for organization	68	26	34	18	16	15	0	7	35	0	7
3 Grant in aid of JSPS	90	17	97	21	13	8	2	8	73	0	12
4 JST	33	6	16	43	3	2	0	4	20	0	5
5 NEDO	20	2	9	3	33	3	0	3	14	0	1
6 Other competitive funding	11	1	4	2	3	12	0	1	5	0	1
7 Contract based research funding	1	0	0	0	0	1	0	0	1	0	0
8 Local government	25	1	12	8	2	1	0	18	12	0	5
9 Private firms	165	11	51	19	16	8	1	10	203	2	13
10 Foreign organizations	0	0	0	0	0	0	0	0	1	2	0
11 Others	31	3	15	7	0	0	0	3	17	0	20

Yellow: Top 30%　Pink：Top10%

Analysis of relations between research funding and performance of I-U collaborative researches

- Independent valuables
  - Follow-up researches: binary +1, -0
  - Academic papers in English: Number of papers
  - Patents applied for JPO: ln(1+Number of applications)
  - Patents applied for foreign patent offices: ln(1+Number of applications)
  - Evaluation on I-O collaborative project by researchers: rank 4 and 5 of 1-5

- Dependent valuables

<Variations of funding> binary +1, -0

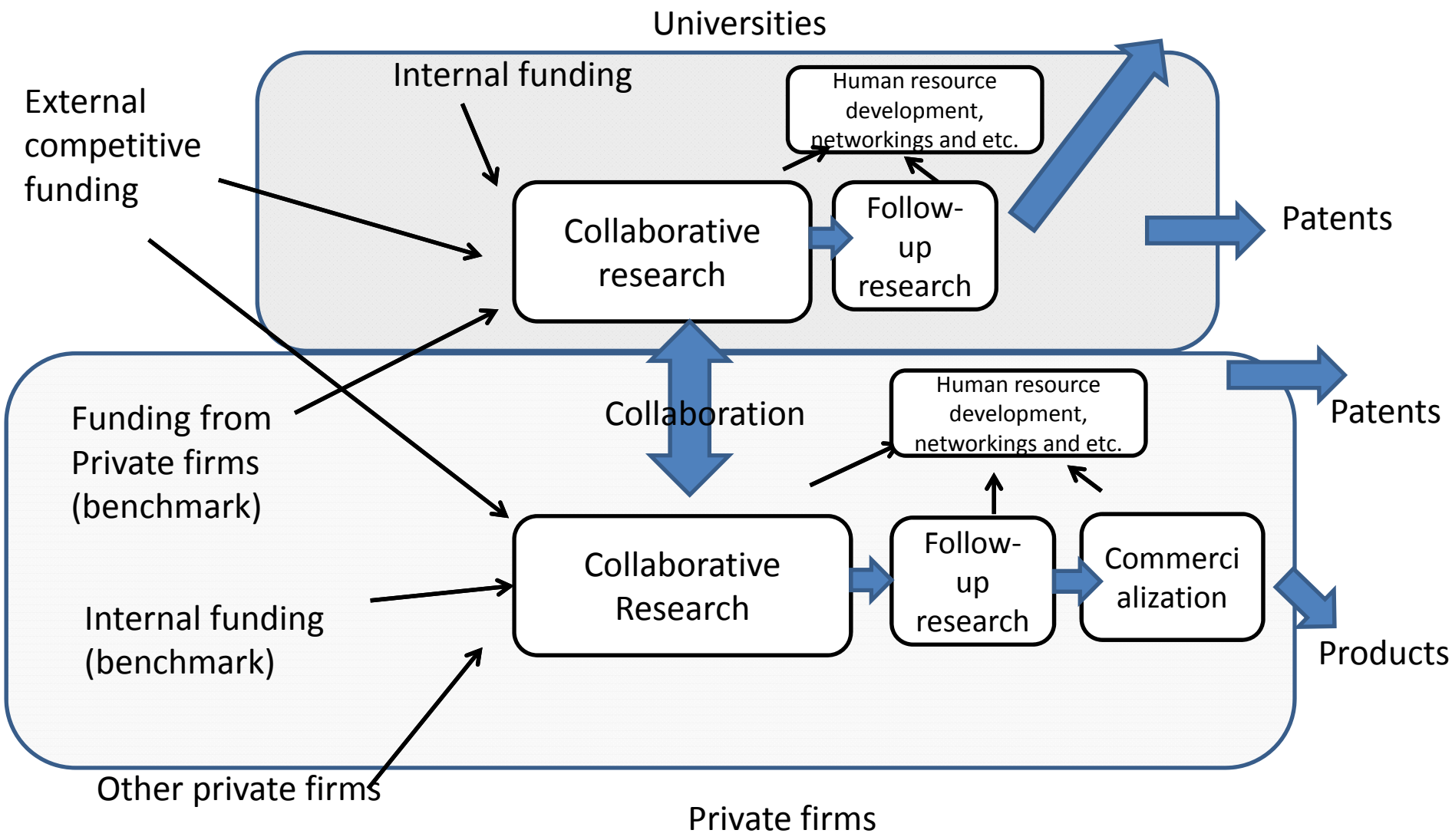
- Internal funding,
- Competitive funding for organizations (such as COE),
- Grant in Aid for Scientific Research, JST, NEDO,
- Other external competitive funding,
- Other external funding (such local government and non-profit organizations), and
- (Other) private firms

<Dummy valuables> binary +1, 0

- Scale of the project: ln(Human Resources, man-months), IPC: A-G,
- Phase of research (Basic, Applied, Development and Others), and
- End year of the project

Positive significancet *** p<1%, **p<5%, *<p<0.1 Negative significance: ~~~p<1%, ~~p<5%, ~<p<0.1

Framework of Analysis



Independent valuables　Follow-up research　+ 1, − 0

Universities

Observations	543
Pseudo-R-squared	0.0727

	Co-efficient	Standard Errors	t-value	Probability
Internal funding	−0.0050	0.0617	−0.0806	0.9358
Competitive funding for organizations	0.1662	0.0936	1.7757	0.0764*
JSPS	0.0333	0.0796	0.4188	0.6756
JST	−0.0393	0.0885	−0.4440	0.6572
NEDO	0.0979	0.0801	1.2214	0.2225
Other competitive funding	0.1261	0.1090	1.1568	0.2479
Other external funding	0.0230	0.0956	0.2409	0.8097
LN(HR)	0.0373	0.0180	2.0688	0.0391**
IPC dummy A	−0.0629	0.0749	−0.8398	0.4014
IPC dummy B	−0.0743	0.0825	−0.9001	0.3685
IPC dummy C	−0.1324	0.0672	−1.9700	0.0494**
IPC dummy D	−0.3144	0.1702	−1.8473	0.0653
IPC dummy E	−0.1854	0.1190	−1.5587	0.1197
IPC dummy F	−0.2108	0.1239	−1.7011	0.0895
IPC dummy G	−0.0529	0.0706	−0.7504	0.4534
Basic Research	0.0845	0.0466	1.8134	0.0703*
Applied Research	0.0652	0.0588	1.1087	0.2681
Development	0.1349	0.0453	2.9789	0.0030***
Other research	−0.1352	0.2474	−0.5463	0.5851
End year	0.0216	0.0064	3.3770	0.0008***
Constant	−43.2425	12.8376	−3.3684	0.0008

Independent valuables	Academic papers in English		LN(1+the number of papers)	
Observations	482			
Pseudo-R-squared	0.2151			

Universities

	Co-efficient	Standard Errors	t-value	Probability
Internal funding	−0.0546	0.1261	−0.4334	0.6649
Competitive funding for organizations	0.4082	0.1817	2.2463	0.0252**
JSPS	0.3409	0.1559	2.1862	0.0293**
JST	0.6291	0.1779	3.5370	0.0004***
NEDO	0.5847	0.1672	3.4971	0.0005***
Other competitive funding	0.5211	0.2139	2.4362	0.0152**
Other external funding	0.1034	0.1918	0.5391	0.5901
LN(HR)	0.2553	0.0358	7.1260	0.0000***
IPC dummy A	−0.4767	0.1510	−3.1571	0.0017***
IPC dummy B	−0.3047	0.1671	−1.8234	0.0689*
IPC dummy C	−0.2822	0.1358	−2.0781	0.0383**
IPC dummy D	−0.1491	0.3441	−0.4333	0.6650
IPC dummy E	−0.2782	0.2833	−0.9818	0.3267
IPC dummy F	−0.1344	0.2607	−0.5156	0.6064
IPC dummy G	−0.2371	0.1431	−1.6576	0.0981*
Basic Research	0.0901	0.0940	0.9592	0.3380
Applied Research	−0.0419	0.1167	−0.3595	0.7194
Development	−0.2265	0.0901	−2.5142	0.0123*
Other research	0.7639	0.5392	1.4168	0.1572
End year	0.0365	0.0126	2.9035	0.0039**
Constant	−72.9464	25.2007	−2.8946	0.0040

Independent valuables　LN(1+Patents applied for JPO)

Observations　522
Pseudo-R-squared　0.1530

Universities

	Co-efficient	Standard Errors	t-value	Probability
Internal funding	−0.1049	0.0737	−1.4247	0.1549
Competitive funding for organizations	0.0253	0.1115	0.2265	0.8209
JSPS	0.1432	0.0956	1.4982	0.1347
JST	0.1485	0.1065	1.3944	0.1638
NEDO	0.3577	0.0967	3.7000	0.0002***
Other competitive funding	−0.0272	0.1333	−0.2040	0.8385
Other external funding	0.0328	0.1131	0.2900	0.7719
LN(HR)	0.1110	0.0217	5.1042	0.0000***
IPC dummy A	−0.2305	0.0891	−2.5880	0.0099***
IPC dummy B	−0.2083	0.0981	−2.1230	0.0342***
IPC dummy C	−0.1360	0.0801	−1.6987	0.0900*
IPC dummy D	0.6047	0.2111	2.8640	0.0044***
IPC dummy E	−0.2277	0.1400	−1.6270	0.1044
IPC dummy F	−0.2006	0.1493	−1.3435	0.1797
IPC dummy G	−0.1715	0.0842	−2.0375	0.0421**
Basic Research	0.0162	0.0557	0.2907	0.7714
Applied Research	0.2174	0.0697	3.1201	0.0019***
Development	−0.0789	0.0539	−1.4629	0.1441
Other research	0.0126	0.2905	0.0433	0.9655
End year	0.0148	0.0077	1.9281	0.0544*
Constant	−29.0527	15.3658	−1.8907	0.0592

Private firms

Independent valuables	Follow-up research		+ 1, − 0	
Observations	514			
Pseudo-R-squared	0.0805			
	Co-efficient	Standard Errors	t-value	Probability
Competitive funding for organizations	0.0186	0.0848	0.2193	0.8265
JSPS	0.1183	0.1678	0.7051	0.4811
JST	0.2412	0.1143	2.1104	0.0353**
NEDO	0.3413	0.1161	2.9385	0.0035***
Other competitive funding	0.4144	0.1416	2.9264	0.0036***
Other external funding	0.1340	0.1805	0.7425	0.4581
Other Private firms	−0.0544	0.1082	−0.5030	0.6152
LN(HR)	0.0110	0.0161	0.6831	0.4949
IPC dummy A	0.0790	0.0749	1.0552	0.2918
IPC dummy B	0.1319	0.0905	1.4574	0.1456
IPC dummy C	0.1387	0.0674	2.0582	0.0401**
IPC dummy D	0.2655	0.2825	0.9398	0.3478
IPC dummy E	0.1435	0.1326	1.0820	0.2798
IPC dummy F	0.0546	0.1326	0.4120	0.6805
IPC dummy G	0.1002	0.0694	1.4426	0.1498
Basic Research	0.0943	0.0477	1.9764	0.0487**
Applied Research	0.1438	0.0521	2.7609	0.0060***
Development	0.0855	0.0482	1.7720	0.0770*
Other research	−0.0477	0.1550	−0.3076	0.7585
End year	0.0207	0.0076	2.7282	0.0066***
Constant	−41.5383	15.2260	−2.7281	0.0066

Private firms

Independent valuables	Commercialization		+ 1, − 0	
Observations	514			
Pseudo-R-squared	0.0707			
	Co-efficient	Standard Errors	t-value	Probability
Competitive funding for organizations	−0.0249	0.1525	−0.3906	0.6963
JSPS	−0.0412	0.1063	−0.3260	0.7446
JST	−0.0305	0.1255	−0.3543	0.7232
NEDO	0.0517	0.3487	0.5905	0.5551
Other competitive funding	−0.1428	1.7927	−1.3389	0.1812
Other external funding	−0.0343	0.0636	−0.2522	0.8010
Other Private firms	−0.0537	0.4343	−0.6590	0.5102
LN(HR)	0.0295	5.8990	2.4288	0.0155**
IPC dummy A	0.0956	2.8771	1.6962	0.0905*
IPC dummy B	0.2093	9.4345	3.0716	0.0022***
IPC dummy C	0.0049	0.0093	0.0963	0.9233
IPC dummy D	−0.0765	0.1294	−0.3597	0.7192
IPC dummy E	0.0682	0.4666	0.6831	0.4949
IPC dummy F	0.1847	3.4204	1.8494	0.0650*
IPC dummy G	0.0960	3.3838	1.8395	0.0664*
Basic Research	−0.0540	2.2569	−1.5023	0.1337
Applied Research	−0.0541	1.8950	−1.3766	0.1693
Development	0.1539	17.9548	4.2373	0.0000***
Other research	−0.0442	0.1431	−0.3783	0.7054
End year	−0.0093	2.6490	−1.6276	0.1043
Constant	18.6637	2.6516	1.6284	0.1041

Private firms

Independent valuables	LN(1+Patents applied for JPO)			
Observations	507			
Pseudo-R-squared	0.1827			
	Co-efficient	Standard Errors	t-value	Probability
Competitive funding for organizations	0.1291	0.1134	1.1383	0.2555
JSPS	−0.2796	0.2185	−1.2796	0.2013
JST	0.0846	0.1489	0.5679	0.5704
NEDO	0.3696	0.1548	2.3875	0.0173**
Other competitive funding	0.2189	0.1915	1.1431	0.2536
Other external funding	−0.0298	0.2350	−0.1269	0.8991
Other Private firms	−0.0152	0.1381	−0.1101	0.9124
LN(HR)	0.1511	0.0213	7.1061	0.0000***
IPC dummy A	−0.4526	0.0994	−4.5558	0.0000***
IPC dummy B	−0.1740	0.1199	−1.4518	0.1472
IPC dummy C	−0.2999	0.0890	−3.3694	0.0008***
IPC dummy D	−0.3371	0.3680	−0.9159	0.3602
IPC dummy E	−0.3290	0.1734	−1.8968	0.0584*
IPC dummy F	−0.2793	0.1733	−1.6113	0.1078
IPC dummy G	−0.2964	0.0915	−3.2400	0.0013***
Basic Research	0.1453	0.0625	2.3260	0.0204**
Applied Research	0.1161	0.0682	1.7015	0.0895*
Development	0.0369	0.0632	0.5837	0.5597
Other research	−0.2186	0.2021	−1.0815	0.2800
End year	0.0074	0.0100	0.7379	0.4609
Constant	−14.0570	20.0365	−0.7016	0.4833

Independent valuables	LN(1+Patents applied for Foreign Patent Offices)			
Observations	433			
Pseudo-R-squared	0.1585			

Private firms

	Co-efficient	Standard Errors	t-value	Probability
Competitive funding for organizations	-0.0642	0.1266	-0.5069	0.6125
JSPS	-0.1241	0.2420	-0.5126	0.6085
JST	-0.0431	0.1533	-0.2811	0.7788
NEDO	0.0829	0.1689	0.4909	0.6238
Other competitive funding	-0.0386	0.2511	-0.1536	0.8780
Other external funding	-0.2257	0.2417	-0.9336	0.3511
Other Private firms	-0.0205	0.1527	-0.1340	0.8934
Human Resources	0.0001	0.0002	0.4002	0.6892
LN(HR)	0.1492	0.0268	5.5644	0.0000***
IPC dummy A	-0.4544	0.1096	-4.1457	0.0000***
IPC dummy B	-0.4653	0.1354	-3.4370	0.0006***
IPC dummy C	-0.3687	0.0964	-3.8255	0.0002***
IPC dummy D	-0.1491	0.3774	-0.3952	0.6929
IPC dummy E	-0.7287	0.2020	-3.6073	0.0003***
IPC dummy F	-0.5963	0.1956	-3.0491	0.0024***
IPC dummy G	-0.3973	0.0997	-3.9858	0.0001***
Basic Research	0.0682	0.0692	0.9852	0.3251
Applied Research	0.1667	0.0787	2.1186	0.0347**
Development	-0.0721	0.0697	-1.0339	0.3018
Other research	0.1742	0.2467	0.7064	0.4803
End year	0.0083	0.0112	0.7415	0.4588
Constant	-16.4714	22.4740	-0.7329	0.4640

Impacts of Public funding on I-U Collaborative research

Universities

	Follow-up research	Academic papers in English	LN(1+Patents applied for JPO)	LN(1+Patents applied for Foreign Patent Offices)
Internal funding				
Competitive funding for organizations	*	**		
JSPS		**		
JST		***		
NEDO		***	***	**
Other competitive funding		**		
Other external funding				
Private firms (benchmark)				

Private firms

	Follow-up research	Commercialization	LN(1+Patents applied for JPO)	LN(1+Patents applied for Foreign Patent Offices)
Internal funding (benchmark)				
Competitive funding for organizations				
JSPS				
JST	**			
NEDO	***		**	
Other competitive funding	***			
Other external funding				
Other Private firms				

Positive significance: *** p<1%, **p<5%, *<p<0.1

Negative significance: ~~~p<1%, ~~p<5%, ~<p<0.1

Evaluation on I-O collaborative project by researchers: Universities <preliminary analysis>

	科学的発見、技術的知見などの実用化による社会還元	研究機器やリサーチマテリアルへのアクセス	研究開発のスピードアップ	企業との人的・組織的ネットワークの形成	企業からのノウハウ獲得	人材育成（参画した研究者・学生の質的向上）	学外での知名度向上	学内における研究開発活動の正当性確保	実用化に向けた社会動向の把握	研究資金の確保
	Social impacts of application of scientific discoveries and technical findings to practical uses	Access to research instruments and materials	Acceleration of R&D	Human and organizational networking with private firms	Acquisition of know-how of private firms	Human resource development for researches and students	Improving presence out of universities	Justification of R&D activities in universities	Grasping social trends for practical applications	Acquisition of research funding
Ratio of 5	12%	3%	5%	13%	4%	17%	7%	5%	9%	9%
Ratio of rank 5 and 4	66%	40%	46%	73%	42%	73%	48%	45%	66%	62%
Internal funding										
Competitive funding for organizations	**									
JSPS										
JST	**								**	
NEDO	***									
Other competitive funding						*				
Other external funding										
Private firms										

Positive coefficient: *** p<1%, ** p<5%, * <p<0.1

Negative coefficient: ~~~p<1%, ~~p<5%, ~<p<0.1

Evaluation on I-O collaborative project by researchers: Private firms

	事業上の重要な技術課題を解決（ニーズ志向）	科学的発見、技術的知見などを新たに事業化（シーズ志向）	研究開発コストの節約	研究機器やリサーチマテリアルへのアクセス	研究開発のスピードアップ	大学との人的・組織的ネットワークの形成	大学からのノウハウ獲得	ハイリスクな研究開発の実施	人材育成（参画した研究者の質的向上）	社外での知名度向上	社内における研究開発活動の正当性確保	研究における大局観の把握（技術シーズの見分け、研究開発の趨勢など）
	Solving important technical problems in business (needs-oriented)	Practical applications of scientific discoveries and technical findings (seeds-oriented)	Reduction of R&D cost	Access to research instruments and materials	Acceleration of R&D	Human and organizational networking with universities	Acquisition of know-how of universities	Implementation of high-risk R&D	Human resource development for participating researches	Improving presence out of private firms	Justification of R&D activities in private firms	Grasping research perspectives (identification of technical seeds, research trends and etc.)
Ratio of rank 5	5%	6%	2%	3%	5%	17%	8%	5%	7%	5%	4%	3%
Ratio of rank 5 and 4	60%	47%	34%	34%	49%	80%	68%	37%	58%	42%	41%	45%

自由記述
（暫定結果）

	大学	企業	合計
(1)産学連携組織	64	38	102
(2)契約、産学の役割	184	197	381
(3)研究資金	96	73	169
(4)人材	27	21	48
(5)その他産学連携一般	34	36	70
(6)本アンケートについて	7	9	16
回答総数	322	318	640

註：重複回答あり。

＜主なコメント＞ 【】は主たる回答者

（1）産学連携組織
・産学連携本部等の質を向上させるべき【企業・大学】

（2）契約、産学の役割
・産学のスピード感の違い【企業】
・守秘への意識の違い。【企業】
・契約手続きは煩雑。【企業・大学】

（3）研究資金
・間接費が高い（一部は適正という回答あり）【企業・大学】
・JST等の競争的資金の運用を柔軟にすべき【大学】

（4）人材
・ポスドクの活用【大学】
・産学連携（知財）の分かる人材の充実【企業・大学】

（5）その他産学連携一般

（6）本アンケートについて
・回答者の負担が大きい。【企業】
・アンケートでは実態は分からないのでインタビューで調査をすべき。【大学】

Preliminary findings and future works

Preliminary findings

1. Generally speaking pre-project researches are based on curiosity-driven research funding, and main collaborative projects are funded by rather mission-oriented research fund such as JST and NEDO.
2. Private firms grant research funding to universities at early stage of research.
3. The amount of each main project is rather small: 1 million yen to 10 million yen.
4. External competitive funding such as JST and NEDO leads to follow-up researches in private firms and have high achievements in academic papers and patent applications in universities.
5. External competitive funding plays important roles as catalysts to promote I-U collaborations.

Preliminary findings and future works

Future works

1. To elucidate paths of causality from inputs, management and performances thorough micro cross analyses. Text analyses of free answer are also important.
2. To identify bottlenecks of process of industry-university collaborations
3. To propose policies and measures for improving industry-university collaborations.

Promotion of SciREX: "Science for Re-designing Science, Technology and Innovation Policy"

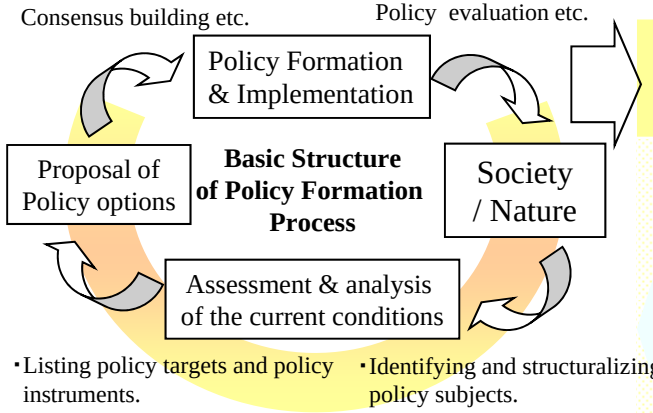
[provisional translation]

Budget Plan for FY2014 : 750 Million yen
(Budget for FY2013 : 737 Million yen)

※excluding the management expenses grants for JST

Overall Goals

- To **identify policy subjects for science, technology and innovation (STI) policy** through a scientific process.
- To **make alternative policy options and conduct social and economic impact analysis** for each of the identified policy subjects
- To pursue to address the policy subjects by **selecting and implementing appropriate policy option**.



- Listing policy targets and policy instruments.
- Identifying and structuralizing policy subjects.
- Analysis of social and economic impacts.
- Making multiple, alternative options, etc.

Fundamental Research and Human Resource Development

- Preparation the core function in order to accelerate promotion of SciREX.
- Foundation of international-level hub institutions for fundamental research and education, based in selected graduate programs.
- Development and promotion of joint programs among the institutions.

504 M yen
(330 M yen)
【MEXT】

Part of Management Expenses Grants for JST
【JST/CRDS】

54 M yen
(56 M yen)
【MEXT】

MEXT Steering Committee

-Coordination of the whole project
-Survey and analysis regarding the whole project

Research Funding

Promotion of a variety of research projects on analytical methods and metrical indicators that will benefit policy formation in mid/long-term.

Part of Management Expenses Grants for JST
【JST/RISTEX】

Mission-oriented Research

Comprehensive survey and analysis on social and economic impacts of R&D funding.

31 M yen
(61 M yen)
【NISTEP】

Data / Information Infrastructure

Organized and continuous compilation of information and data as a basis for policy formation, research and analysis.

161 M yen
(156 M yen)
【MEXT・NISTEP】