

**Performance Evaluation of the
Preliminary Feasibility Study in Korea:
A Quantitative Assessment**

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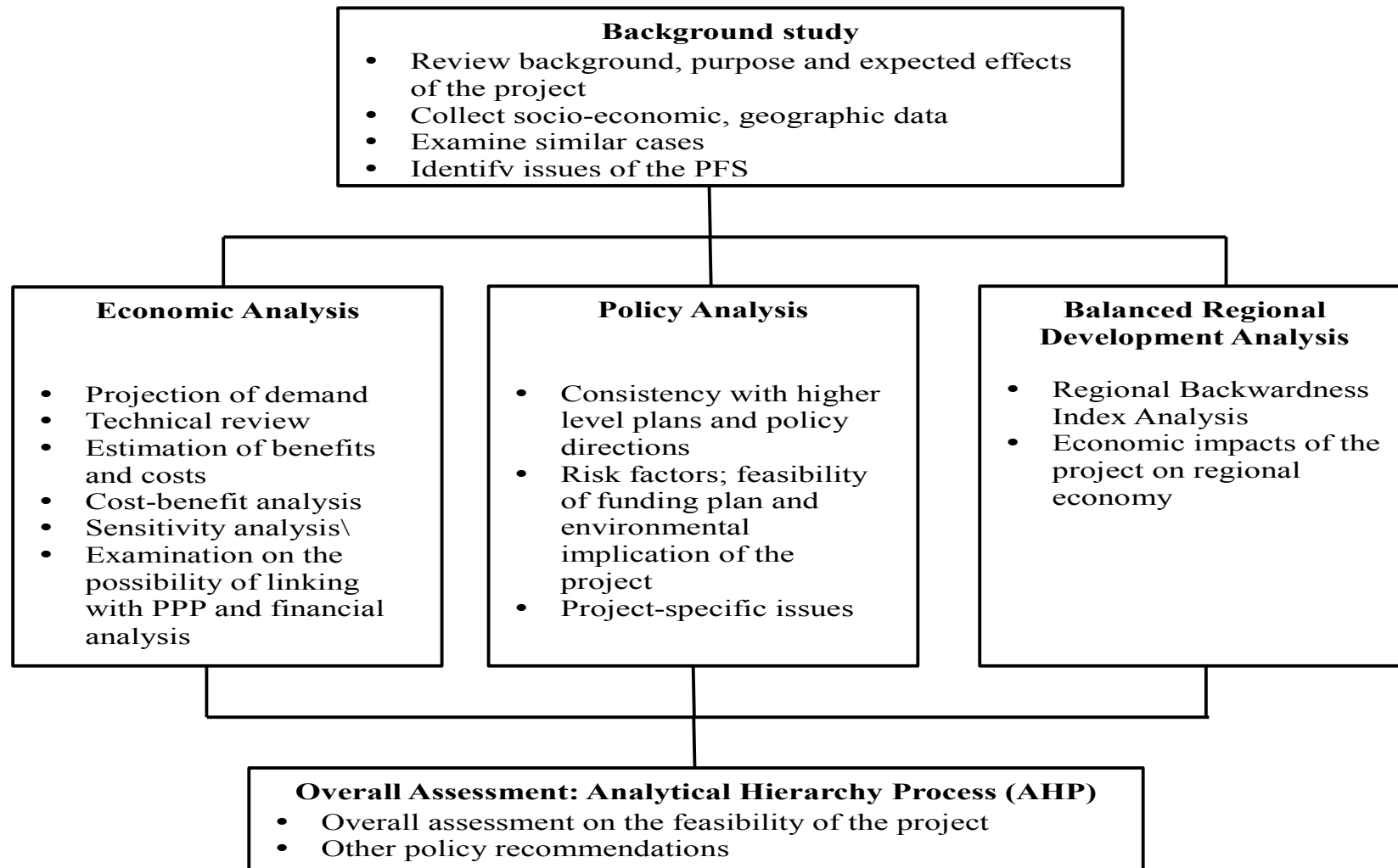
Motivation

- The preliminary feasibility study (PFS) has examined feasibility of 576 government investment/ expenditure projects between 1999 and 2013.
 - The sum of proposed total project costs amounts to 267 trillion Korean Won (equiv. to 254 billion USD).
 - 204 out of 576 projects (TPC of 104 trillion KRW) turned out to be infeasible by the PFS.
- We can assess the impacts of the PFS on budget process from two aspects, qualitative and quantitative.
 - The very existence of the PFS may have contributed to improving **institutional quality** of budget process.
 - The PFS may have contributed to **save taxpayers' money** by blocking socially unjustifiable government investment/ expenditure projects implements.
- The paper tries to assess performances of the PFS from **quantitative** perspectives.

The Preliminary Feasibility Study

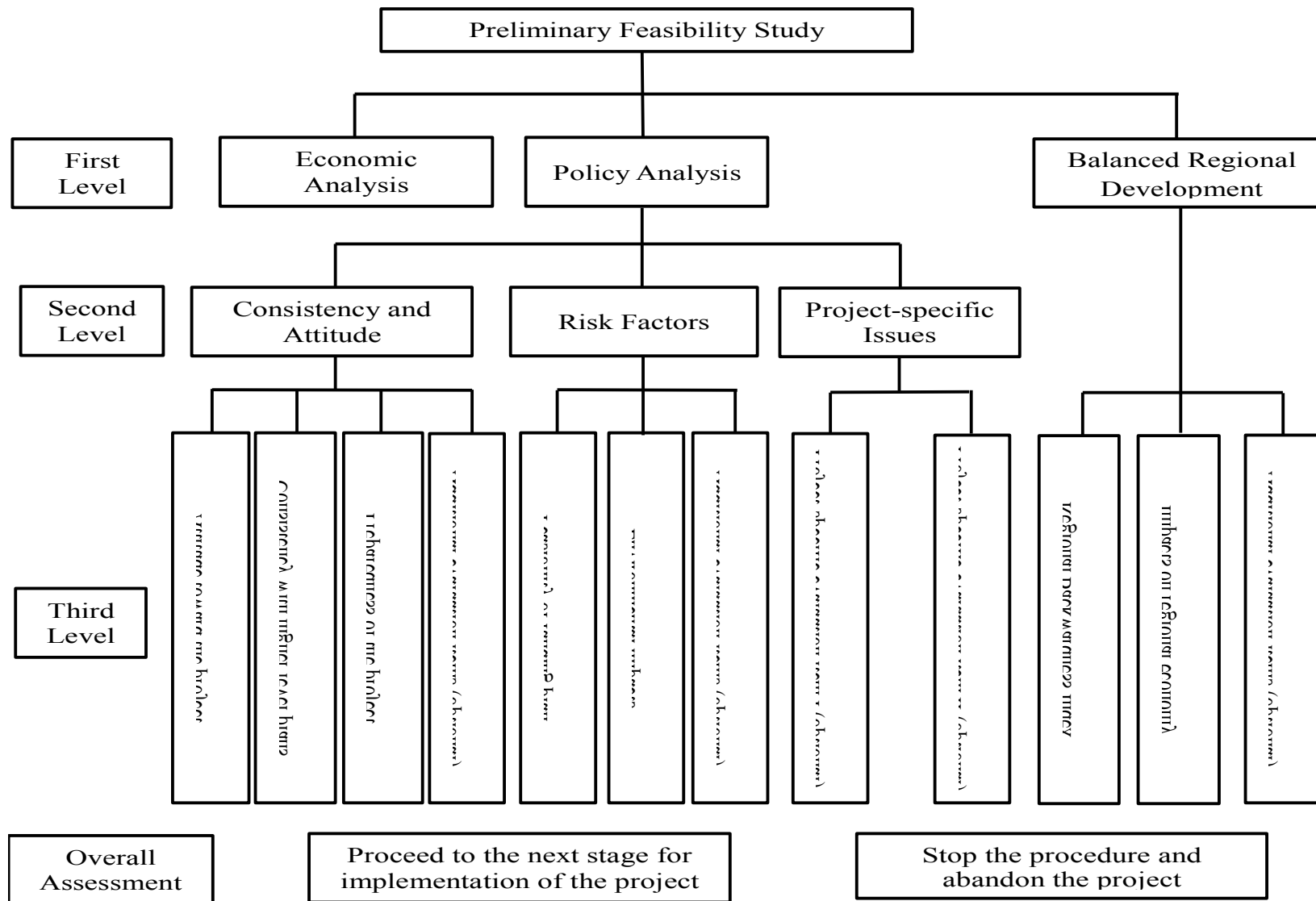
- The PFS
 - A quick and inexpensive (but still reliable) investigation on “feasibility” of government expenditure projects
 - The result of the PFS is regarded as VERY IMPORTANT information for decision makings in budget process.
- What are the subjects of the PFS?
 - All government projects in the area of **construction, information technology, and R&D expenditure** with total suggested **cost no less than 50 billion KRW**, out of which **more than 30 billion KRW** are financed by the assistance from the central government.
 - The conditions for exemption from the LFS are clearly specified by the National Finance Law that is the legal foundation of the PFS.

What are done in the PFS?



Source: KDI (2008)

Evaluation Scheme: Analytic Hierarchy Process



Source: KDI (2008)

Economic vs. Overall Feasibility

- Economic feasibility; an important component of the assessment on overall feasibility
 - Cost-benefit analysis
- Overall feasibility; economic feasibility + policy consideration
 - **AHP: Quantified expert opinion** on the justifiability of a government investment/expenditure project from **social** point of view
 - A project is assessed as “feasible” if AHP score is no lower than 0.5.

Portfolio of PFS Studies

The Number of the PFSs by Sector: 1999-2013

(unit: cases, %)

Year	Road	Railway	Seaport	Culture and Tourism	Water Resources	Others	Total
1999	11 (55.0)	2 (10.0)	1 (5.0)	4 (20.0)	1 (5.0)	1 (5.0)	20
2000	11 (36.7)	7 (23.3)	5 (16.7)	2 (6.7)	1 (3.3)	4 (13.3)	30
2001	20 (48.8)	14 (34.1)	1 (2.4)	5 (12.2)	0 (0.0)	1 (2.4)	41
2002	9 (30.0)	8 (26.7)	2 (6.7)	2 (6.7)	5 (16.7)	4 (13.3)	30
2003	10 (31.3)	7 (21.9)	3 (9.4)	5 (15.6)	5 (15.6)	2 (6.3)	32
2004	24 (43.6)	13 (23.6)	1 (1.8)	2 (3.6)	3 (5.5)	12 (21.8)	55
2005	11 (36.7)	6 (20.0)	2 (6.7)	1 (3.3)	3 (10.0)	7 (23.3)	30
2006	27 (51.9)	10 (19.2)	5 (9.6)	5 (9.6)	1 (1.9)	4 (7.7)	52
2007	30 (65.2)	5 (10.9)	1 (2.2)	2 (4.3)	1 (2.2)	7 (15.2)	46
2008	12 (31.6)	2 (5.3)	4 (10.5)	3 (7.9)	2 (5.3)	15 (39.5)	38
2009	22 (34.9)	5 (7.9)	2 (3.2)	2 (3.2)	12 (19.0)	20 (31.7)	63
2010	7 (14.6)	14 (29.2)	2 (4.2)	1 (2.1)	2 (4.2)	22 (45.8)	48
2011	6 (14.0)	5 (11.6)	2 (4.7)	11 (25.6)	5 (11.6)	14 (32.6)	43
2012	7 (20.0)	7 (20.0)	5 (14.3)	6 (17.1)	5 (14.3)	5 (14.3)	35
2013	5 (38.5)	0 (0.0)	1 (7.7)	2 (15.4)	1 (15.4)	4 (30.8)	13
Total	215 (36.8)	105 (18.2)	38 (6.4)	43 (9.2)	47 (8.2)	128 (21.2)	576

Note: 1) The number of the PFSs completed by the end of each year is reported.
 2) Others include airport, information technology, R&D, and other budgetary expenditure projects.
 3) The PFSs administered by KDI are counted.
 4) The numbers in parentheses are the proportion of each sector in each year.

Source: PIMAC

Portfolio of PFS Studies

TPC of the PFSs by Sector: 1999-2013

(unit: trillion Korean Won, %)

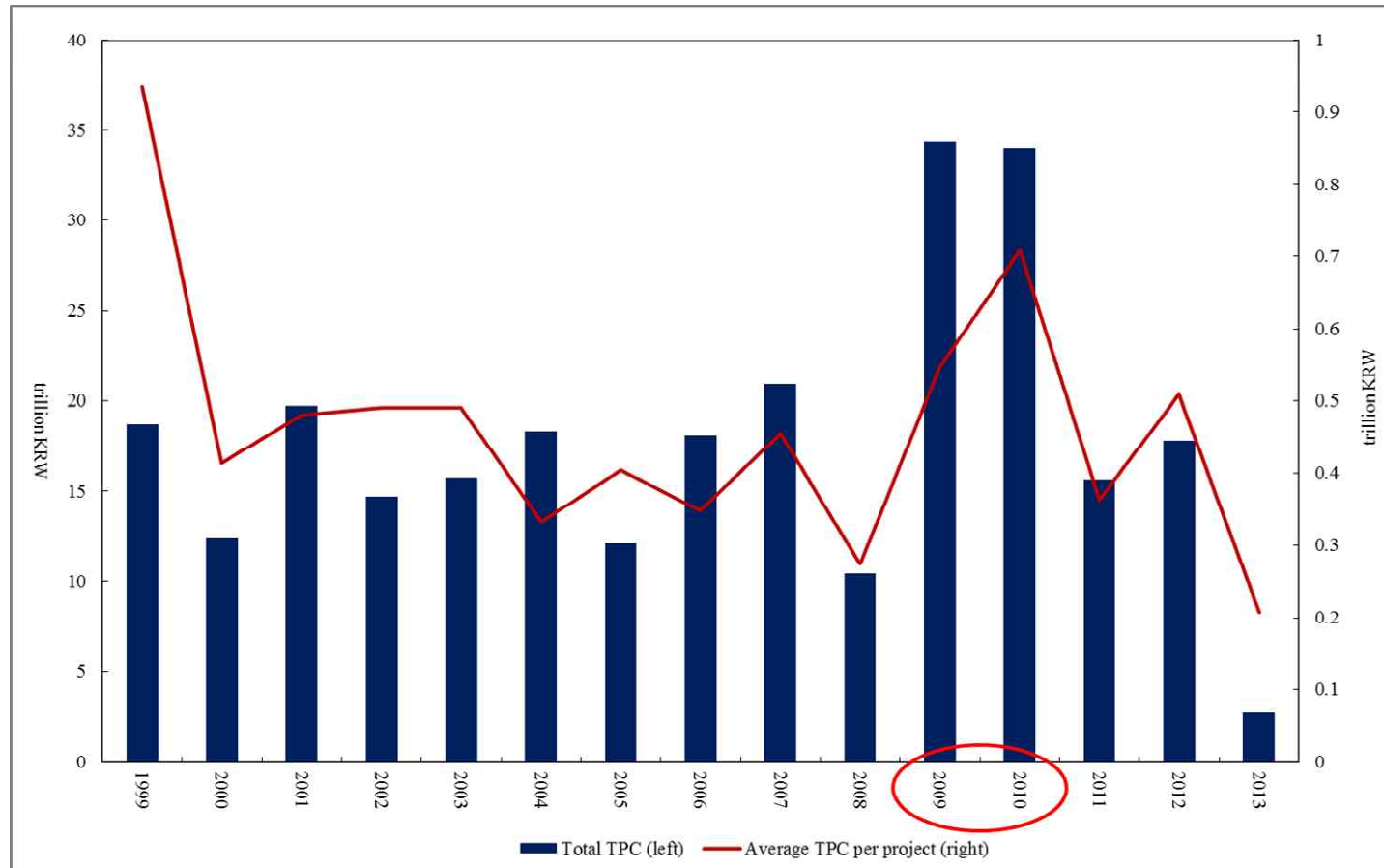
Year	Road	Railway	Seaport	Culture and Tourism	Water Resources	Others	Total
1999	14.9 (79.7)	2.0 (10.7)	0.1 (0.5)	0.3 (1.6)	0.6 (3.2)	0.7 (3.7)	18.7
2000	4.9 (39.5)	4.6 (37.1)	0.8 (6.5)	1.5 (12.1)	0.04 (0.3)	0.5 (4.0)	12.4
2001	6.1 (31.0)	12.1 (61.4)	0.1 (0.5)	1.4 (7.1)	0.0 (0.0)	0.1 (0.5)	19.7
2002	5.9 (40.1)	6.2 (42.2)	0.3 (2.0)	0.5 (3.4)	1.1 (7.5)	0.7 (4.8)	14.7
2003	5.3 (33.8)	5.4 (34.4)	1.9 (12.1)	1.0 (6.4)	1.3 (8.3)	0.8 (5.1)	15.7
2004	7.1 (38.8)	6.4 (35.0)	1.0 (5.5)	1.0 (5.5)	0.2 (1.1)	2.5 (13.7)	18.3
2005	3.5 (28.9)	4.6 (38.0)	0.4 (3.3)	1.4 (11.6)	0.4 (3.3)	1.7 (14.0)	12.1
2006	7.7 (42.5)	7.3 (40.3)	1.3 (7.2)	0.6 (3.3)	0.1 (0.6)	1.1 (6.1)	18.1
2007	6.8 (32.5)	4.2 (20.1)	2.0 (9.6)	0.2 (1.0)	0.1 (0.5)	7.6 (36.4)	20.9
2008	2.6 (25.0)	1.1 (10.6)	1.0 (9.6)	0.3 (2.9)	0.4 (3.8)	5.0 (48.1)	10.4
2009	13.1 (38.1)	7.7 (22.4)	0.4 (1.2)	0.3 (0.9)	3.4 (9.9)	9.5 (27.6)	34.4
2010	5.7 (16.8)	17.9 (52.6)	0.5 (1.5)	0.1 (0.3)	0.5 (1.5)	9.3 (27.4)	34.0
2011	1.3 (8.3)	6.1 (39.1)	0.6 (3.8)	1.9 (12.2)	2.0 (12.8)	3.7 (23.7)	15.6
2012	1.8 (10.1)	10.3 (57.9)	2.1 (11.8)	1.1 (6.2)	0.8 (4.5)	1.7 (9.6)	17.8
2013	0.8 (29.6)	0.0 (0.0)	0.1 (3.7)	0.1 (3.7)	0.4 (14.8)	1.3 (48.1)	2.7
Total	87.5 (33.0)	95.9 (36.1)	12.6 (4.7)	11.7 (4.4)	11.3 (4.3)	46.2 (17.4)	265.5

Note: 1) The number of the PFSs completed by the end of each year is reported.
 2) Others include airport, information technology, R&D, and other budgetary expenditure projects.
 3) The PFSs administered by KDI are counted.
 4) The numbers in parentheses are the proportion of each sector in each year.

Source: PIMAC

The Global Financial Crisis and the PFS

Total and Average TPCs: 1999-2013



Note: 1) The total TPC is the sum of TPCs of the PFSs completed in each year.

2) The average TPC is obtained by dividing the total TPC with the number of PFSs completed by the end of each year.

Source: PIMAC

Regional (Political?) Distribution of the PFS

The Number of the PFSs by Region: 1999-2012

(unit: cases, %)

Year	Seoul/ Gyeonggi	Choong- chung	Cholla	Gyungsang	Kangwon/ Jeju	Multiple	Total
1999	1 (5.0)	3 (15.0)	5 (25.0)	4 (20.0)	4 (20.0)	3 (15.0)	20
2000	4 (13.3)	4 (13.3)	5 (16.7)	10 (33.3)	1 (3.3)	6 (20.0)	30
2001	13 (31.7)	4 (9.8)	7 (17.1)	11 (26.8)	3 (7.3)	3 (7.3)	41
2002	6 (20.0)	2 (6.7)	5 (16.7)	10 (33.3)	2 (6.7)	5 (16.7)	30
2003	8 (25.0)	1 (3.1)	10 (31.3)	10 (31.3)	1 (3.1)	2 (6.3)	32
2004	19 (34.5)	8 (14.5)	8 (14.5)	16 (29.1)	0 (0.0)	4 (7.3)	55
2005	11 (36.7)	4 (13.3)	3 (10.0)	5 (16.7)	5 (16.7)	2 (6.7)	30
2006	15 (28.8)	7 (13.5)	8 (15.4)	14 (26.9)	4 (7.7)	4 (7.7)	52
2007	11 (23.9)	14 (30.4)	6 (13.0)	9 (19.6)	3 (6.5)	3 (6.5)	46
2008	9 (23.7)	5 (13.2)	4 (10.5)	13 (34.2)	3 (7.9)	4 (10.5)	38
2009	11 (17.5)	10 (15.9)	9 (14.3)	25 (39.7)	2 (3.2)	6 (9.5)	63
2010	13 (27.1)	6 (12.5)	3 (6.3)	17 (35.4)	2 (4.2)	7 (14.6)	48
2011	7 (16.3)	5 (11.6)	3 (7.0)	19 (44.2)	1 (2.3)	8 (18.6)	43
2012	9 (25.7)	3 (8.6)	4 (11.4)	9 (25.7)	2 (5.7)	8 (22.9)	35
Total	137 (24.3)	76 (13.5)	80 (14.2)	172 (30.6)	33 (5.9)	65 (11.5)	563

Note: 1) The number of the PFSs completed by the end of each year is reported.

2) Others include airport, information technology, R&D, and other budgetary expenditure projects.

3) The PFSs administered by KDI are counted.

4) The numbers in parentheses are the proportion of each sector in each year.

5) Multiple means the number of the PFS projects covering more than one province.

Source: PIMAC

What Passed the Economic Feasibility Test?

- 45.6% of projects examined by the PFS have passed the economic feasibility test (b/c ratio).
 - In terms of TPC, the proportion of passing projects is 42.3%
 - Big differences in passing rate across project sectors
- No significant change in passing rate in 2009 and 2010.
 - Good?; guard against political influence
 - Bad?; restrain government ability to exercise the power to carry out flexible fiscal policy

What Passed the Economic Feasibility Test?

TPC of the Projects with Economic Feasibility (B/C Ratio ≥ 1): 1999-2012

(unit: billion KRW, %)

Year	Road	Railway	Seaport	Culture/ Tourism	Water Resources	Others	Total
1999	4,042 (27.1)	664 (33.0)	74 (100)	156 (37.2)	600 (100)	730 (100)	6,266 (33.4)
2000	2,672 (54.9)	3,466 (75.3)	707 (86.3)	0 (0.0)	37 (100)	348 (64.8)	7,231 (58.2)
2001	2,044 (33.7)	4,008 (33.1)	0 (0.0)	120 (8.8)	0 (n.a.)	0 (0.0)	6,172 (31.3)
2002	1,509 (25.6)	5,145 (84.4)	245 (81.3)	0 (0.0)	0 (0.0)	504 (76.4)	7,403 (50.4)
2003	4,744 (89.2)	4,338 (79.9)	1,881 (100)	0 (0.0)	678 (53.0)	272 (35.2)	11,913 (75.9)
2004	3,937 (55.4)	3,627 (56.4)	1,050 (100)	0 (0.0)	76 (33.0)	1,688(67.3)	10,377 (56.6)
2005	650 (18.4)	1,570 (34.0)	425 (100)	0 (0.0)	276 (66.6)	1,393 (80.2)	4,314 (35.6)
2006	2,739 (35.7)	2,622 (35.7)	658 (52.6)	300 (51.4)	0 (0.0)	1,046 (91.0)	7,365 (40.8)
2007	4,328 (63.2)	0 (0.0)	0 (0.0)	104 (49.7)	93 (100)	5,700 (75.4)	10,224 (48.9)
2008	1,219 (47.8)	217 (19.2)	758 (79.5)	179 (51.3)	248 (36.5)	512 (10.2)	3,132 (30.2)
2009	399 (4.4)	6,153 (80.0)	111 (28.6)	137 (54.3)	792 (23.2)	7,298 (76.6)	14,888 (43.3)
2010	5,271 (92.2)	2,552 (13.9)	492 (100)	87 (100)	1,162(100)	2,933 (31.9)	12,496 (36.2)
2011	995 (71.6)	0 (0.0)	188 (16.5)	876 (50.7)	641 (32.1)	2,098 (58.4)	4,798 (30.8)
2012	1,552 (86.1)	0 (n.a)	616 (28.8)	184 (17.1)	582 (75.7)	1,671 (27.6)	4,605 (20.8)
Total	36,101(45.4)	34,362(35.8)	7,205 (62.1)	2,143 (20.0)	5,185 (71.0)	26,193 (58.3)	111,189(42.3)

Note: 1) The number of the PFSs completed by the end of each year is reported.

2) Others include airport, information technology, R&D, and other budgetary expenditure projects.

3) The PFSs administered by KDI are counted.

4) The numbers in parentheses are the proportion of each sector in each year out of all projects examined by the PFS in the corresponding sector..

Source: PIMAC

What Passed the Overall Feasibility Test?

- **64.6%** of projects examined by the PFS have passed the overall feasibility test (AHP score).
 - In terms of TPC, the proportion of passing projects is 58.2%
 - 104 (TPC of 42 trillion KRW) economically infeasible projects were “saved” by the AHP.
- Upward trend in passing rate
 - Is it because the atmosphere surround the PFS has become more generous?
 - Or is it because ministries proposing projects have become more prudent in selecting candidates for the PFS?
- No significant change in passing rate in 2009 and 2010.

What Passed the Overall Feasibility Test?

The Number and TCP of Projects with Overall Feasibility

Year	Number	TCP
1999	13 (65.0)	5,975 (31.9)
2000	17 (56.7)	7,191 (57.9)
2001	18 (43.9)	8,676 (44.0)
2002	18 (60.0)	8.625 (58.7)
2003	19 (59.4)	12,173 (77.5)
2004	41 (74.5)	11,988 (65.3)
2005	19 (63.3)	7,436 (61.4)
2006	28 (53.8)	9,499 (52.6)
2007	26 (56.5)	16,209 (77.5)
2008	26 (68.4)	6,466 (62.3)
2009	43 (68.3)	21,962 (63.9)
2010	37 (77.1)	21,121 (61.1)
2011	32 (74.4)	10,638 (68.0)
2012	25 (71.4)	13,678 (61.8)
2013	10 (76.9)	
Total	372 (64.6)	153,021 (58.2)

Reversal of Feasibility

Economic Feasibility vs. Overall Feasibility: The Number of Projects

(unit: cases, %)

Year	B/C ≥ 1		B/C < 1		Total Projects (A)	Feasible Projects (B)	(B/A)*100
	AHP ≥ 0.5	AHP < 0.5	AHP ≥ 0.5	AHP < 0.5			
1999	8 (40.0)	1 (5.0)	5 (25.0)	6 (30.0)	20	13	65.0
2000	16 (53.3)	1 (3.3)	1 (3.3)	12 (40.0)	30	17	56.7
2001	14 (34.1)	0 (0.0)	4 (9.8)	23 (56.1)	41	18	43.9
2002	13 (43.3)	1 (3.3)	5 (16.7)	11 (36.7)	30	18	60.0
2003	17 (53.1)	0 (0.0)	2 (6.3)	13 (40.6)	32	19	59.4
2004	27 (49.1)	1 (1.8)	14 (25.5)	13 (23.6)	55	41	74.5
2005	15 (50.0)	1 (3.3)	4 (13.3)	10 (33.3)	30	19	63.3
2006	21 (40.4)	2 (3.8)	7 (13.5)	22 (42.3)	52	28	53.8
2007	20 (43.5)	0 (0.0)	6 (13.0)	20 (43.5)	46	26	56.5
2008	16 (42.1)	0 (0.0)	10 (26.3)	12 (31.6)	38	26	68.4
2009	26 (41.3)	1 (1.6)	17 (27.0)	19 (30.2)	63	43	68.3
2010	24 (49.0)	0 (0.0)	13 (26.5)	11 (24.5)	48	37	75.5
2011	19 (44.2)	0 (0.0)	13 (30.2)	11 (25.6)	43	32	74.4
2012	17 (48.6)	0 (0.0)	8 (22.9)	10 (28.6)	35	25	71.4
Total	253 (44.9)	8 (1.4)	108 (19.3)	195 (34.4)	564	362	64.2

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3) The PFSs administered by KDI are counted.

4) The numbers in parentheses are the proportion of each case in each year out of all projects examined by the PFS in the corresponding sector..

Source: PIMAC

Determinants of Feasibility Reversal

- Probit analysis
 - 108 cases with feasibility reversal – no economic feasibility but overall feasibility
 - Explanatory variables; characteristics of projects (size, sector, location) and research team (composition, affiliation of PM, compensation)
- Explanatory variables are, in general, impotent in explaining the feasibility reversals.
 - Interpretation: good sign in that the decision to override the result of economic analysis is **not affected by institutional or behavioral biases**.
 - One significant exception: When the leader of research team is a member of KDI, the probability of feasibility reversal is **significantly lower**!

Determinants of Feasibility Reversal

	Model I	Model II	Model III
ln(Proposed TPC)	0.0205 (0.1269)	-0.0338 (0.1399)	-0.0585 (0.1548)
R&D	1.6729* (0.9343)	1.5334* (0.9568)	0.9865 (1.0434)
Miscel.	0.1790 (0.6797)	-0.0275 (0.6916)	-0.3358 (0.9019)
Road	-0.0687 (0.6464)	-0.4225 (0.6529)	-0.5295 (0.8853)
Water Resources	0.4847 (0.7438)	0.3016 (0.7659)	0.1375 (0.9812)
Railway	0.3346 (0.6828)	0.1942 (0.6932)	-0.0550 (0.8910)
Culture and Tourism	0.0278 (0.7322)	0.0569 (0.7400)	0.2517 (0.9674)
Information	1.1336 (1.0298)	-0.0888 (1.322)	-0.4820 (1.5399)
Seoul/Gyunggi	0.0589 (0.3931)	0.0866 (0.4577)	-0.1215 (0.4722)
Gyungsang	0.0273 (0.4593)	0.0874 (0.4120)	0.0094 (0.4277)
Cholla	0.3539 (0.4775)	0.4086 (0.5006)	0.5725 (0.5615)
Choongchung	-0.0102 (0.5507)	0.0775 (0.4884)	-0.1643 (0.5369)
Cost Team_Resrarch Institutes		-0.5999 (0.7588)	-0.3403 (0.7601)
Cost Team_University.		1.6265 (0.9454)	1.6195 (0.9298)
Demand Team_Research Institutes		-0.2719 (0.6188)	0.0580 (0.7011)
Demand Team University.		0.4288 (0.5214)	0.4563 (0.5754)
PM_KDI		-0.7990*** (0.3300)	-0.7008* (0.3982)
ln(Fee)		0.6858 (0.4233)	0.5410 (0.4273)
Constant	-1.0091 (1.2185)	-0.0804 (1.4374)	0.3653 (1.9686)
Year Dummy	No	No	Yes
No. of Observations	307	307	307
Pseudo R ²	0.0246	0.0643	0.1790
Wald	8.92(13)	26.45(19)*	66.02(32)***

Budget Saved

- Almost **40%** of proposed TCP have been saved due to the rigorous screening by the PFS.

	TPC_PRO (A)	TPC_OPT (B)	SAV1 (C)	SAV2 (D)	SAVR1 (C/A)*100	SAVR2 (D/B)*100
1999	18732.6	27155.9	11372.3	19795.6	60.7	72.9
2000	12423.4	15243.9	2954.8	5775.3	23.8	37.9
2001	19699.5	19840.1	10441.7	10582.3	53.0	53.3
2002	14693.3	16205.9	5799.4	7312.0	39.5	45.1
2003	15705.1	17627.8	2065.8	3988.5	13.2	22.6
2004	18347.9	18574.0	5043.7	5269.7	27.5	28.4
2005	12107.6	12356.1	3708.5	3956.9	30.6	32.0
2006	18051.7	19353.1	8838.6	10140.1	49.0	52.4
2007	20907.1	18952.1	4697.6	2742.7	22.5	14.5
2008	10376.6	9047.1	5298.0	3968.5	51.1	43.9
2009	34375.5	30327.0	12413.6	8365.1	36.1	27.6
2010	34578.4	28760.4	17027.0	11209.1	49.2	39.0
2011	15013.5	14693.7	5253.4	4933.6	35.0	33.6
2012	22132.6	20850.2	8797.5	7515.0	39.7	36.0
Total	267144.8	268987.2	103711.9	105554.4	38.8	39.2