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Performance of PPP in Korea

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PPP (Public-Private Partnership) Implementation Challenges and Policy Responses

The Phases of the PPP Framework in Korea

	Period	Characteristics
Phase I	1968–1994	▪ PPP projects based on individual laws (Road Act, Port Act, etc)
Phase II	1994–1998	▪ 'The Act on Promotion of Private Capital Investment in Social Overhead Capital'
Phase III	1999–2004	▪ 'The Act on Private Participation in Social Overhead Capital' • Establishing **PIMAC**, Improving the Korea **Infrastructure Credit Guarantee Fund** (ICGF) system, granting buyout rights • Positive government support for vitalizing private investment(including **MRG** program) • Encouraging **unsolicited proposals**
Phase IV	2005–Now	▪ Revision of 'the Act on Private Participation in Infrastructure' • Introduction of **BTL** scheme as a new method • Strengthened fiscal disciplines including introduction of **VfM test**

Key Delivery Challenges against PPP Implementation after Legislation in 1994

- Lack of detailed rules and regulations on PPP project implementation
  - Step by step implementation guidance was not in place
  - No clear and consistent criteria on PPP project selection (PPP selected on an ad hoc basis)
  - No guidelines for risk allocation
  - Unnecessary regulations to protect government officials from future audit and inspection (discretionary power to government officials)
- Lack of skilled manpower in the public sector
  - In particular government officials in the implementation ministries have limited capacity on management of legal, financial issues
  - Conventional procurement preferred to PPP
- No strong private financial institution to develop long term financial products
  - No experience of long-term project financing scheme
  - PF requires capacity to appraise long financial viability on non-recourse or limited-recourse basis.
- Asian Financial Crisis

Promotion of PPP in Response to AFC

- 1999, “Comprehensive Plan to Promote PPP” formulated in the wake of Asian Financial Crisis in 1997-98
- Risk allocation
  - Consistent and explicit rule of risk allocation
  - MRG (Minimum Revenue Guarantee) clause introduced
  - Early termination payment clause
  - Foreign exchange volatility risk mitigated (80~120% fluctuation)
  - Infrastructure Credit Guarantee Fund
- Encouraging UP (Unsolicited Proposals)
  - Streamlining implementation procedure of unsolicited proposal
  - Bonus point (max 10%) awarded at the bidding stage
- PPP unit, PICKO, 1999 (→ PIMAC in 2005)
  - Technical assistance to PPP project implementation organizations
    - Standardized documentation for RFP, bidding, and negotiation
  - Policy advisory in formulation of PPP policies
  - Theoretical and practical research on PPP
  - PPP market promotion by inducing FDI

PPP Projects by Sector

Unit (no, bill KRW)
1 Bill KRW=0.75 mill USD

Sector	No	Investment (KRW)	Average
School	278	11,796	42.4
Env't	221	17,547	79.4
Military	93	6,823	73.4
Road	66	47,465	719.2
Parking	31	358	11.6
Rest Area (Road)	3	65	21.8
Culture & Tourism	42	2,312	55.0
Seaport	17	7,216	424.5
Welfare	20	802	40.1
Metro/Rail	18	28,510	1583.9
Airports	14	826	59.0
Logistics	6	1,211	201.9
ICT	8	753	94.2
Housing	1	24	23.7
Sum	818	125,708	153.7

Source: PIMAC(2023), 2022 PIMAC Annual Report.

PPP program size of selected countries

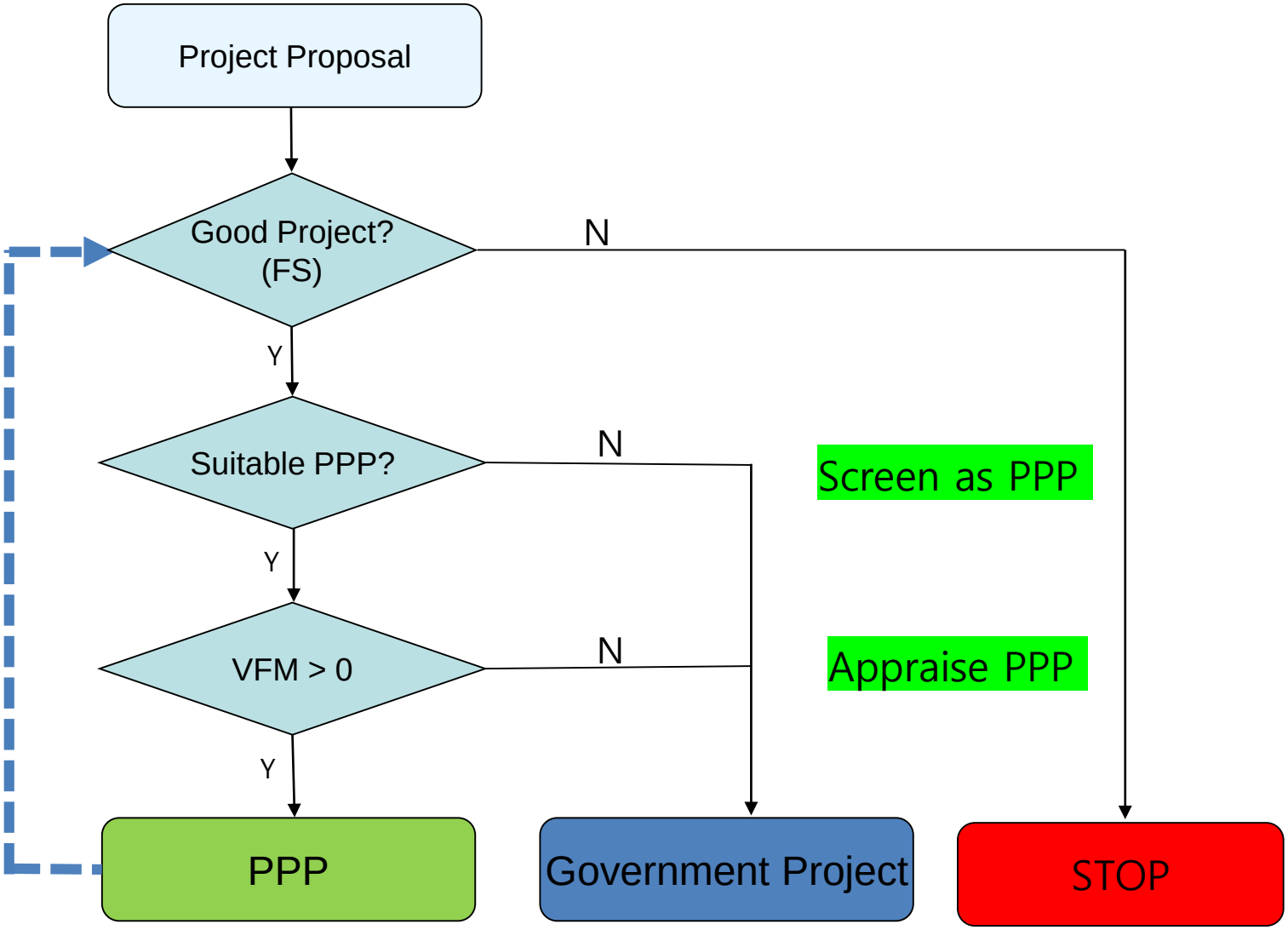
	USD billion	Number
Brazil	469	1,191
China	327	2,050
India	302	1194
Turkey	148	263
Indonesia	76	155
Vietnam	33	161
UK	GBP 57 bill	700+
Korea	About 100	818

Source: World Bank PPI Database, and PIMAC (2023)

Success factors of Korea's PPP

- Institutional framework for private participation
  - Hierarchical and streamlined institutional arrangements
  - Making the future of project more foreseeable
  - Providing the statutory right to cover the investment and security for financing
- Government's supports
  - Financial support (construction subsidy),
  - Infrastructure credit guarantee,
  - Risk sharing during operation period (MRG)
  - Termination payment
- Dedicated to PPP Unit; PIMAC
  - PIMAC's implementation guidance expedites implementation and enhances the transparency in PPP procedure
- Unified framework for project selection (FS, VfM)

PPP Project Selection in Korea



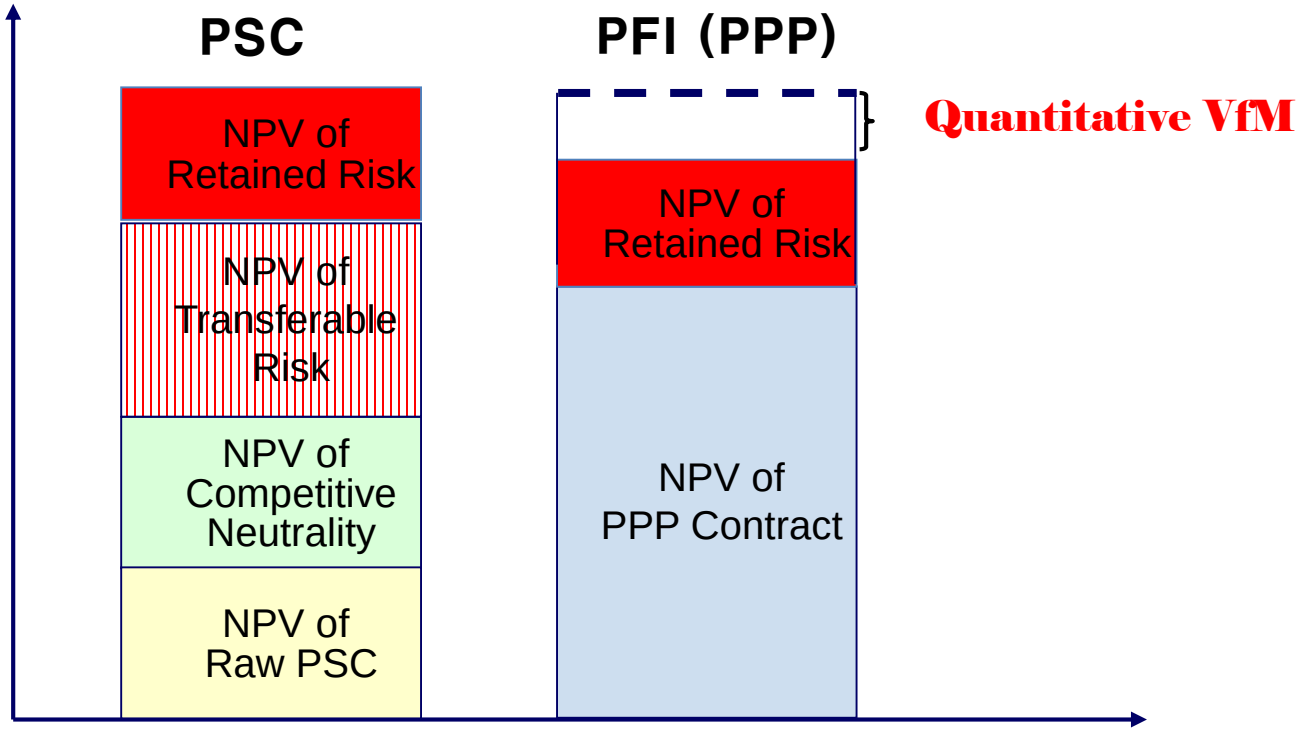
Potential Benefits of PPPs and Value for Money

Potential Benefit of PPP

- Fiscal Flexibility
  - Faced with budget constraint, government can take PPP as a financial option to fill the infrastructure gap timely.
- Efficiency Gain
  - Minimizing LCC (Life Cycle Costs) by bundling DBFO (Design-Build-Financing-Operation) works into a single contract
  - Little possibility of cost and time overruns (Little optimism bias)
  - Risk allocation: Each party manages risks that they are best able to handle
  - Resource source allocation through market mechanism (Only bankable project will be implemented)
- Quality Service
  - Private operators have incentive to improve the quality of services as the remuneration of SPV is significantly linked to the performance of the asset
  - For user-pays PPP, the revenue is proportional to the number of users.
  - For government-pays PPP, the government payment is linked to user satisfaction
- Reform the Public Sector
  - Competition between public and private parties
  - Improved transparency and accountability because of many stakeholders involved in the transaction

Concept of VFM Test

- Compare the government burden of PSC with that of PFI (PPP)
- To decide if the PPP is a suitable procurement option



VfM Test (Toll Road)

Function	PSC (conventional)	PFI (PPP)
Design	1	X
Build	2	X
Finance	3	X
O&M	4	X
Tariff	**5**	**X**
Government Payment	**a=(1+2+3+4)-(5)**	**b=0**

If a>b=0, then PFI is a better procurement option, or, "PPP delivers Value for Money."

VfM Test (Toll Road) Considering Risk Transfer

Function	PSC (conventional)	PFI (PPP)
Design	1	X
Build	2	S (Subsidy)
Finance	3	X
O&M	4	X
Risk	R1+R2+R3+R4	R1(retained risk)
Tariff	**5**	**X**
Government Payment	**a=(1+2+3+4)-(5)+ R1+R2+R3+R4**	**b=S+R1**

If a>b, then PFI is a better procurement option.

VFM %

- Present value of government payments for PSC (Public Sector Comparator) and PFI (Private Finance Initiative) options are compared in present value term and VfM(%) is calculated

$$VfM(\%) = \frac{GP(PSC) - GP(PFI)}{GP(PSC)}$$

  - GP(PSC): Present value of government payment for PSC option
  - GP(PFI): Present value of government payment for PFI option

- GP(PSC): Capital expenses + O&M expenses – Tariff
- GP(PFI) : Construction subsidy (Viability Gap Funding), or Government Payment for Government-Pays PPP

Features of VfM Test

- Hypothetical analysis: comparison of PSC and PFI based on hypothetical scenario
- Financial analysis from the perspective of government (or Ministry of Finance)
- A Cost Effectiveness Analysis

Performance Evaluation of Korea's PPP

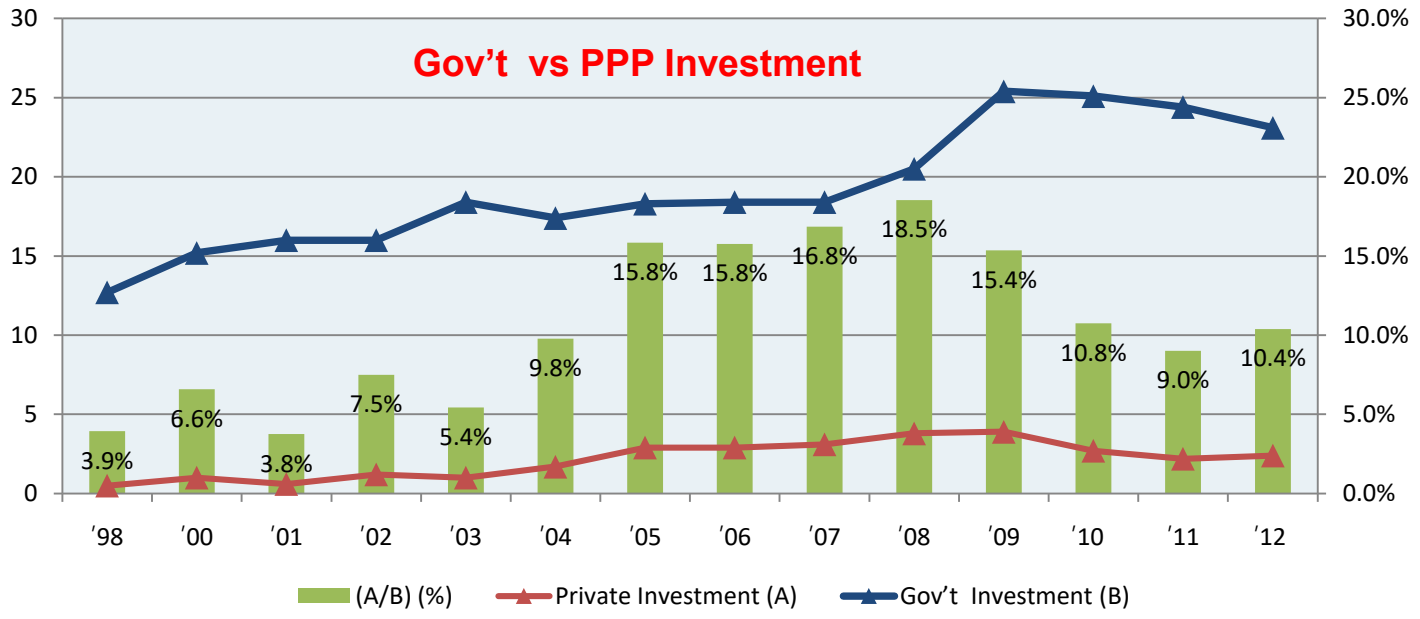
Criticism and Popular Belief on PPPs in Korea

- Criticisms
  - MRG payment has resulted in excessive fiscal burden on central and local governments.
  - PPP projects charge much higher tariff than conventional government projects.
- Wide-spread view about PPP projects
  - PPPs have not delivered VfM.
  - If VfM tests have been conducted at the project selection phase, those PPP projects would have been cancelled.
  - If many PPP projects were procured through conventional government projects, it could have save government spending, enhancing fiscal productivity.

1) Expanded Fiscal Space

- PPP has contributed to expand the fiscal space
  - PPP secured alternative funding, increasing infrastructure investment by 4% to 18.5% per year (Average: 10.7% per year) in 1998-2012
  - The promotion of PPP has helped ease constraints on the government's financial resources, enabling it to secure resources for increasing social expenses

bil USD



Source: KDI PIMAC, Internal data

A : Private investment involvement in SOC sector, covering central government BTO projects, local government BTO projects more than 200B KRW or with 30B more national fund and BTL rail projects

B : Annual budget in transportation and regional development sector, The Five-year National Fiscal Management Plan

2-1) ex post VfM for Road PPP Projects

- Hyeon PARK, et al. (2018), “Do Public Private Partnership Projects Deliver Value for Money? An ex post Value for Money (VfM) Test on Three Road Projects in Korea,” International Journal of Urban Sciences
- All three projects include MRG clause with the coverage of, respectively.
- All three projects would have been analyzed to deliver VfM despite of MRG clauses
  - If VfM tests had been conducted at the time of the concession agreement
- However, only one project is analyzed to deliver VfM if the test were to be conducted with latest information (Dec 2012).
- Two other projects do deliver VfM because of lowered interest rate
  - The interest rate of government bond has dropped from 8.7% (2000) to 3.2% (2012)
  - The discount rate has also been dropped from 9.5% to 6.0%
    - The discounted value of MRG of PFI gets bigger with lower discount rate.

Results of ex post VfM Test

Unit: Billion KRW

	Project A		Project B		Project C	
	PSC	PFI	PSC	PFI	PSC	PFI
Sum of GP	164.3	1,492.1	149.1	1,429.6	441.4	423.0
PV of GP	578.4	682.4	438.3	526.4	404.5	246.1
VfM (%)	-18.0		-20.1		39.2	

As of Dec 2012

Results of pretended ex ante VfM Test

Unit: Billion KRW

	Project A (1997)		Project B (2000)		Project C (2005)	
	PSC	PFI	PSC	PFI	PSC	PFI
Sum of GP	205.4	1,921.7	247.3	2,098.7	364.6	359.6
PV of GP	695.9	689.8	615.3	578.2	394.8	226.1
VfM (%)	0.88		6.03		42.7	
MRG Coverage	82% (20 years)		90% (20 years)		70% (10 years)	

As of contract signing

Explaining the VfM Change

- Projects A and B signed in 1997 and 2000 respectively could not achieve VfM if the VfM test is conducted now (with latest information available). The worsened VfM is attributable to:
  - The discount rate has been dropped from 9.5% to 6.0%
    - The discounted value of MRG of PFI gets bigger with lower discount rate.
  - The interest rate of government bond has also dropped
    - The lower interest rates put less burden of government project.

year	1997	1998	1999	2000	2001	2002	2003	2004
Govt bond i.r.	12.17%	13.18%	8.60%	8.66%	6.20%	6.30%	4.76%	4.33%
year	2005	2006	2007	2008	2009	2010	2011	2012
Govt bond i.r.	4.53%	4.96%	5.28%	5.36%	4.64%	4.30%	3.89%	3.24%

Factors of VfM Results

- Construction subsidy (or, Viability Gap Funding)
  - Construction subsidy ↓ → VfM ↑
- Interest rate of government bonds
  - Interest rate ↑ → VfM ↑
- Discount rate
  - Discount rate ↑ → VfM ↑

The Impacts of Construction Subsidy

Construction subsidy	Interest rate of govt bond	GP(PSC)	GP(PFI)	Difference	VfM(%)
30%	5%	31.4	47.1	-15.7	-50.1%
20%	5%	31.4	31.4	0.00	0.00

The Impacts of Interest Rate of Bond

Interest rate of govt bond	GP(PSC)	GP(PFI)	Difference	VfM(%)
5%	31.4	47.1	-15.7	-50.1%
12%	81.2	62.0	19.2	23.6%

The Impacts of Discount Rate

Discount rate	Interest rate of govt bond	GP(PSC)	GP(PFI)	Difference	VfM(%)
8%	5%	31.4	47.1	-15.7	-50.1%
10%	5%	30.3	42.2	-11.9	-39.1%

PIMAC (2022), VfM Test Results for selected Road PPP Projects

Unit: 100m KRW

Project	ex post VfM				Pretended ex ante VfM			
	PSC	PFI	VfM	VfM (%)	PSC	PFI	VfM	VfM (%)
1	5,998	3,308	2,690	44.85	304	3,096	(2,792)	-917.80
2	3,766	1,818	1,948	51.74	2,210	1,746	463	20.97
3	2,147	0	2,147	100	2,149	0	2,149	100
4	4,446	824	3,622	81.48	2,292	824	1,468	64.06
5	4,317	87	4,230	97.99	3,116	87	3,029	97.21
6	6,526	564	5,962	91.35	3,507	564	2,943	83.91
7	4,917	259	4,658	94.74	2,628	259	2,370	90.16
8	2,439	0	2,439	100	1,756	0	1,756	100

Implications

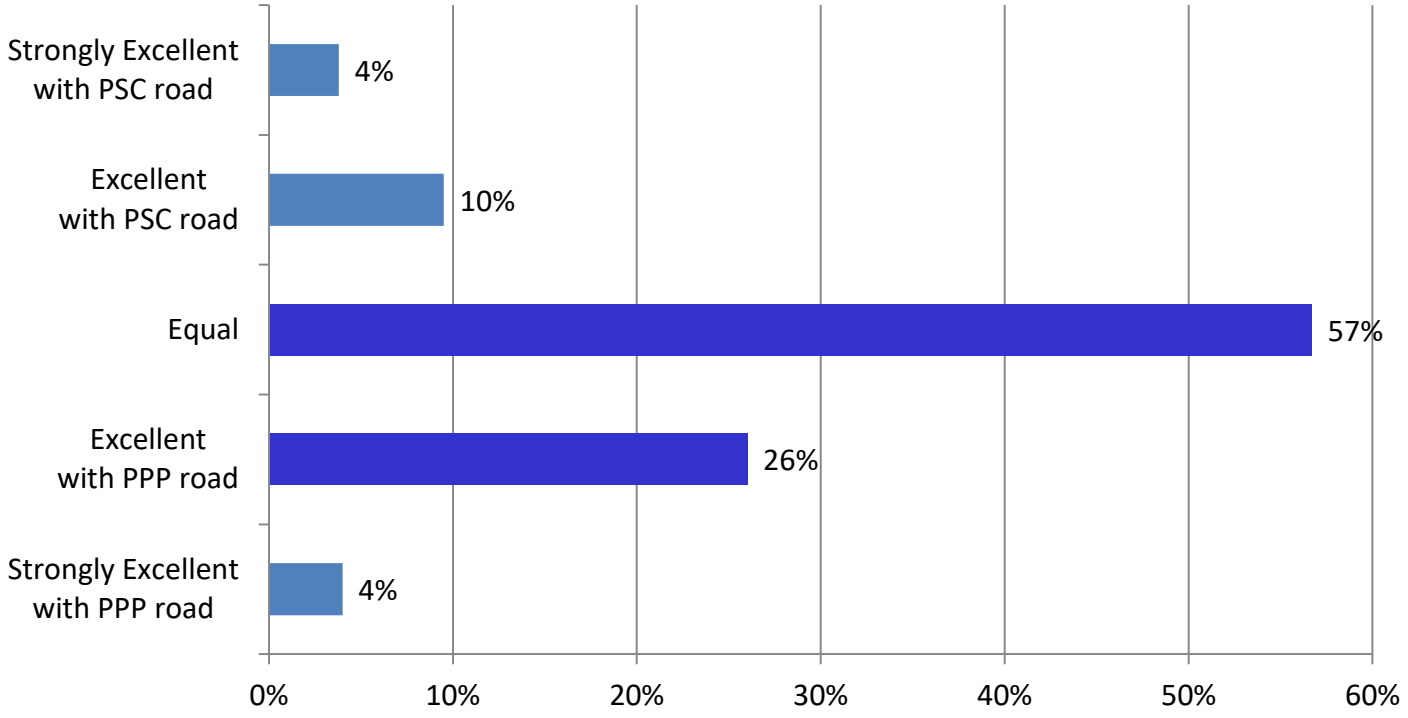
- Introduction of MRG clause is not necessarily bad choice in the financial context with high interest rate
  - All three projects would have been appraised as suitable project that deliver VfM
  - With high interest rate, it was reasonable choice to defer the government payment from direct construction subsidy to future contingent liabilities even though it invited criticism from the fiscal management.
- Rigidity of the contract due to long term nature of PPP causes risks both for public and private parties.
  - VfM is strongly influenced by the financial discount rate and the interest rates applied to the government bonds
  - Adjustment mechanism can be introduced: e.g. adjust the FIRR on a regular basis, such as every five years, in sync with the change in the government bond yields.
- Level of tariff matters
  - High toll decreases the number of users, resulting in lowered economic viability
  - High toll also creates public criticism against PPP policy
  - The VfM Test needs to incorporate burden of user charges as well as fiscal burden of government

2-2) ex post VfM for School PPP Projects

- Hyeon PARK (2007), ex-post Value for Money test on twelve high school PPP projects (BTL: Build-Transfer-Lease)
- The PPP school projects delivered VfM at 7.2%
  - Ten BTL school projects saved government spending compared with conventional government school projects
- No case of cost overrun reported.
- Only one case of time overrun
  - The actual construction period was shortened by 8% on average

3-1) Service Satisfaction: Road PPP Projects

- Satisfaction with a PPP road relative to PSC roads run by Korea Expressway Corporation



Source: Hyeon PARK (2014)

3-2) Service Satisfaction: School PPP Projects

- Students of PPP school showed higher satisfaction than conventional government school users.
  - They show absolutely higher satisfaction level with facility maintenance such as cleaning, temperature control, lighting, and safety management, etc.
- The group of the head of school administration did not have significant difference in the satisfaction level

Source: Hyeon PARK (2007)

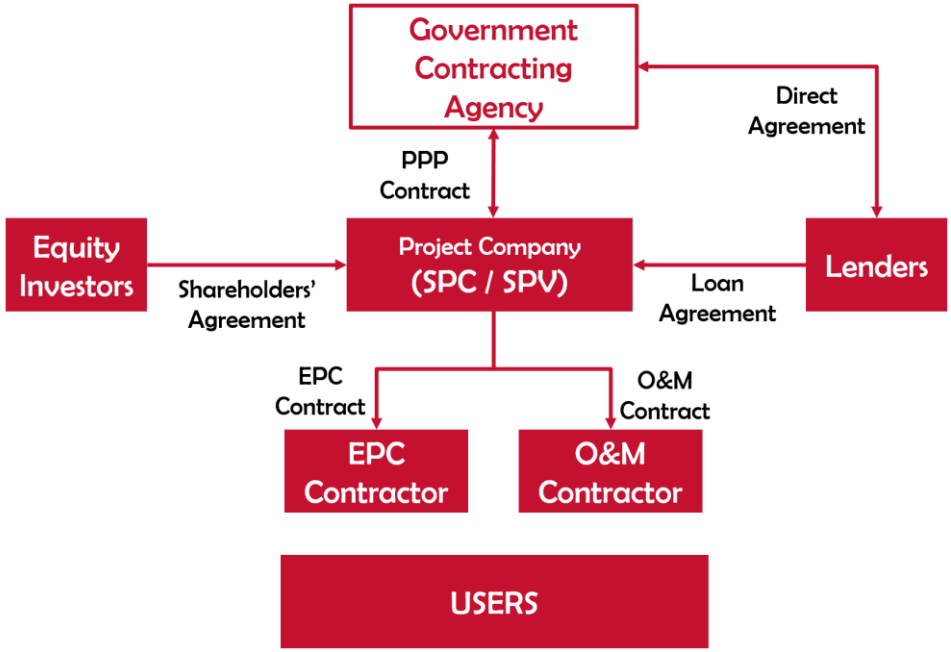
4) Public Sector Reform

- Lack of empirical studies on impacts of PPP on public sector reform and its impacts does not seem to be substantial
- SOEs do not seem to be favorable toward expansion of PPP program
  - Episode 1: LH does not welcome expanding public housing projects through PPP even though PH projects are major sources of financial deficit of the institution
  - Episode 2: The labor union of KORAIL had long standing protest against privatization of SRT, second high speed rail operator in Korea.
- PPP can be used as an effective modality to transform SOEs in Korea

Concluding Remarks

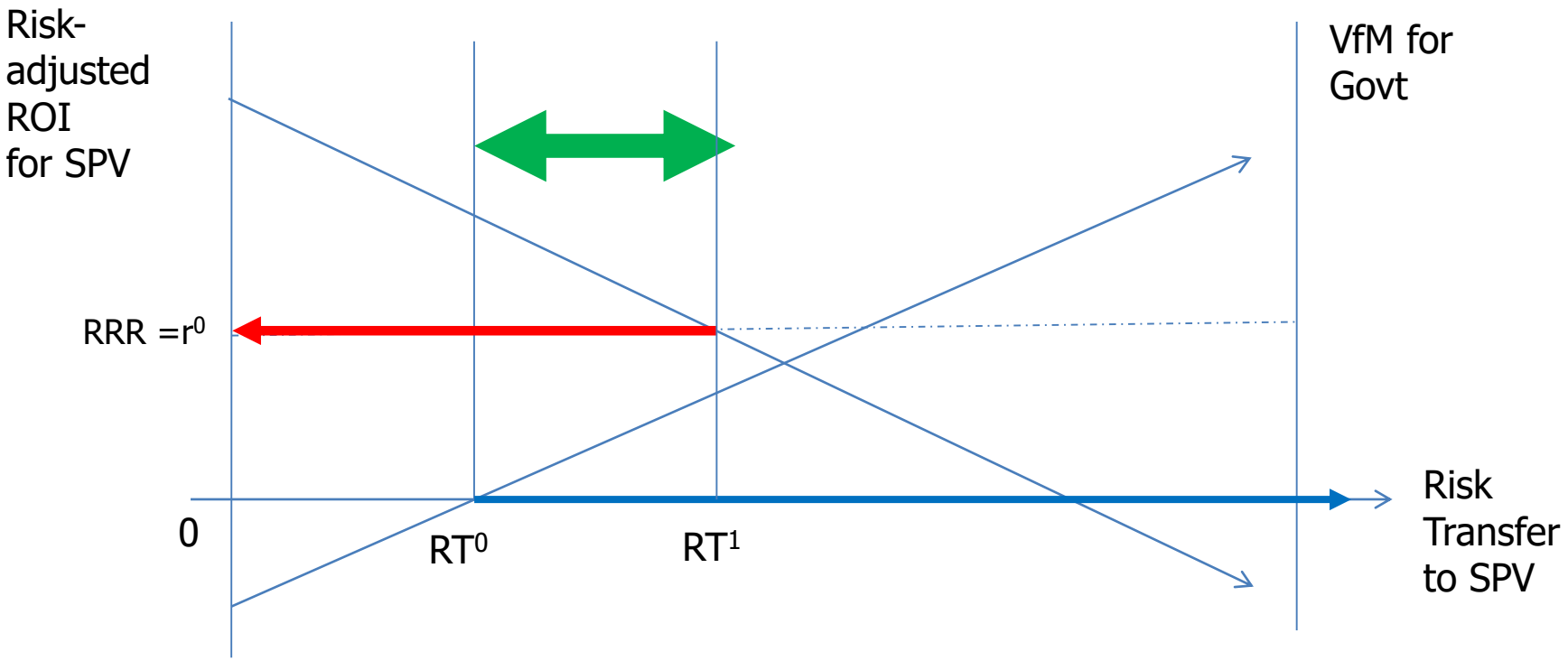
The Successful PPP should meet the interests of all stakeholders

- Government
  - ✓ Financial affordability (VfM)
  - ✓ Economic efficiency (B/C)
- Investor/SPV
  - ✓ Financial viability (ROI: Return on Investment, FIRR)
- Lenders
  - ✓ Bankability (DSCR)
  - ✓ Interest rate
- Users
  - ✓ Affordability (Toll)



Source: Adapted from WB, ADB & IADB (2014: 51) and WB(2017: 41), PPP Reference Guide

Financial Viability and VfM



- The green arrow area ($RT^0 < RT < RT^1$) meets both public and private interests on PPP
  - $RT < RT^1$ → IRR > r^0 ,where r^0 = RRR for SPC; and
  - $RT < RT^0$ → VfM > 0

Balance in PPP policy : Market Promotion vs Fiscal Discipline

	Market Promotion	Fiscal Discipline
Focus of PPP	Fiscal Space	Efficiency gains (Value for Money/ Fiscal Soundness)
governance	One-off project basis approach (One-stop service)	Policy basis approach with established institutional arrangements (Due diligence)
	Line ministry Investment Committee	Inter-ministerial PPP Steering Committee/ MOF Independent PPP unit
competition	Bonus point for proponent proposal	Reimbursement of bidding cost

Independent Evaluation Unit Helps

- Management of PPP requires different set of skills for government project management: legal and financial knowledge
- The VfM Test should be conducted on a regular basis, securing VfM not only at the entry level but also for a whole of contract period, renegotiating the contract in response to the change in financial context
- Well developed evaluation guidelines and continuous revision for the management of PPP

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Appendix:
MRG payments for road PPP projects

MRG Policy (1999~2009)

- Minimum Revenue Guarantee (MRG): A certain level of forecasted annual revenues is guaranteed by government. And when the actual operating revenue falls short of it, the government pays the deficit.

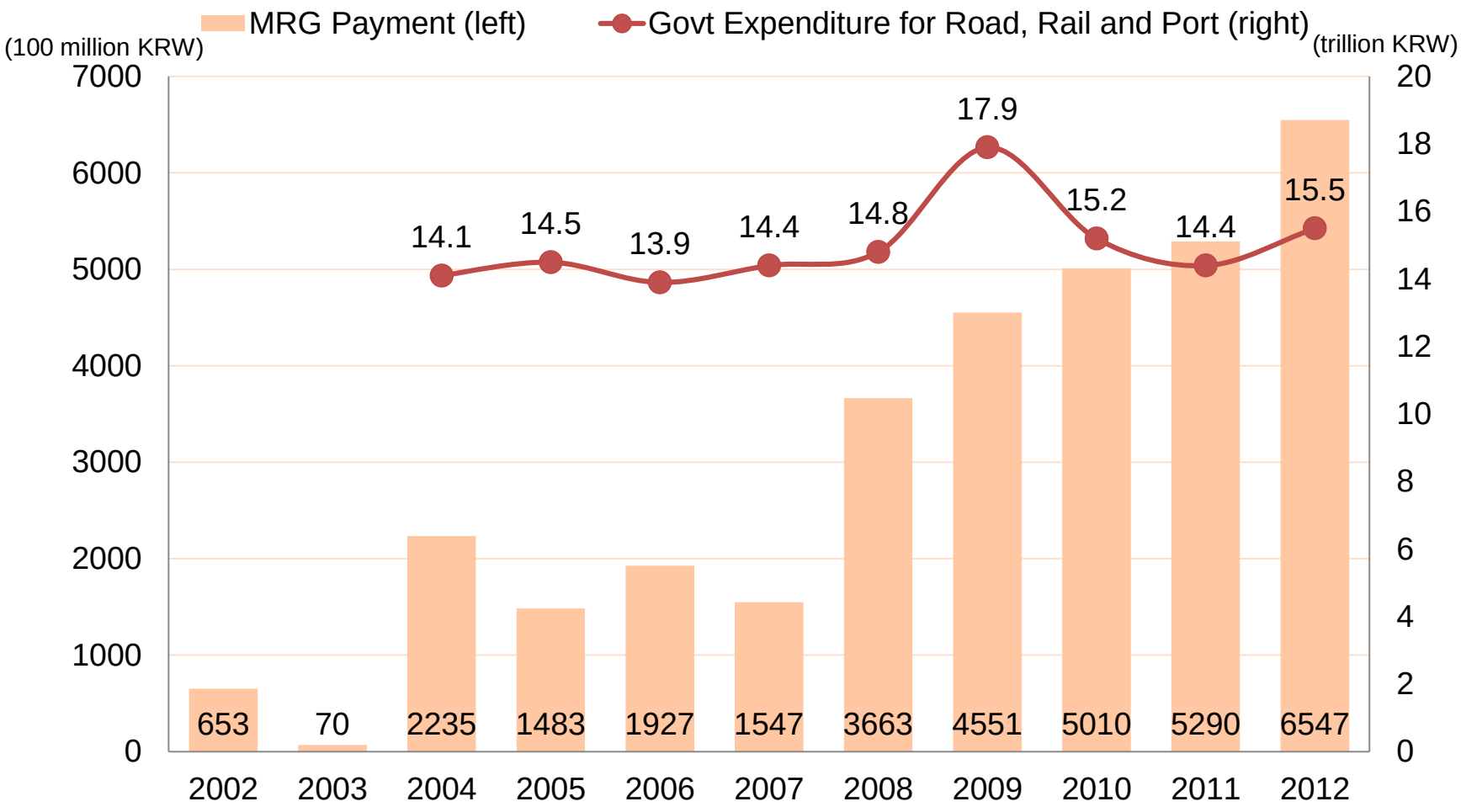
	Jan 1999		May 2003	January 2006		Oct.2009
	Solicited	Unsolicited		**Solicited***	Unsolicited	
Period	Whole operating period		15 Years	10 Years	Abolished	Abolished
Guarantee Level (Max)	90%	80%	First 5 Years 90% Next 5 Years 80% Last 5 Years 70%	First 5 Years 75% Next 5 Years 65%		
Condition	None		No MRG applied if Actual Revenue < 50% of Forecasted Revenue	Same as Left		

- Criticisms against MRG
  - ✓ Government took most of the risks, but still provided high returns on investment to SPC.
  - ✓ MRG scheme provided SPC with incentives to overestimate future demand.

MGR payment

- Under the MRG (Minimum Revenue Guarantee) clause, the government take substantial project demand risk by guaranteeing minimum level of forecasted revenue.
- Among the operating 633 PPP projects as of end of 2012, 78 projects include MRG provision in the concession agreement, 39 of which generate MRG payments.
- Total MRG payments from 2002 to 2012 equaled about 3.3 trillion KRW (approximately 3 billion USD).
- Meanwhile, the average government investment for road, rail and port sectors from 2004 to 2012 is about 15 trillion KRW
  - ✓ Such unexpected MRG payment comprised around 2.4% of the total planned investment amount, incurring significant fiscal burden to the government.

MRG Payment (2)



Source: "National Fiscal Management Plan 2012~2016 for SOC Sector," SOC Sector Task Force, Open Debate Session, June 2012.
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