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40 Years of Public-Private Partnerships in China: Reflections and Lessons Learned

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1.1 Overview of Infrastructure

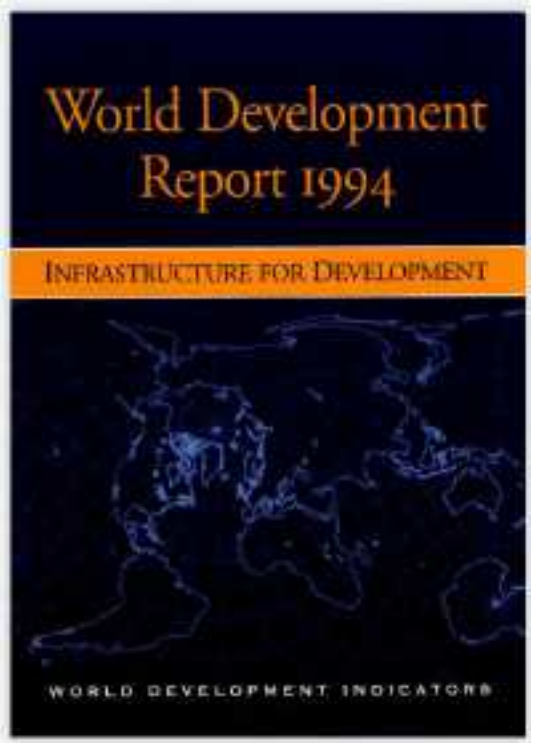
Infrastructure: Broad and Fragmented

Infrastructure is roughly defined as the basic services or social capital of a country which enable economic and social activities to take place. It takes the form of assets, such as water supply and waste treatment systems, power production and distribution networks, roads, transport systems and social service provision including schools, hospitals and court houses. (World Bank 1994).

In developing countries, governments own, operate, and finance nearly all infrastructure, primarily because its production characteristics and the public interest involved were thought to require monopoly (World Bank 1994).

There are three general types of infrastructure:

- Economic infrastructure
- Social infrastructure
- Institutional infrastructure



The World Bank's (1994) World Development Report's key research on infrastructure emphasizes the crucial role of infrastructure in the development process.

1.1 Overview of Infrastructure

Infrastructure: Broad and Fragmented

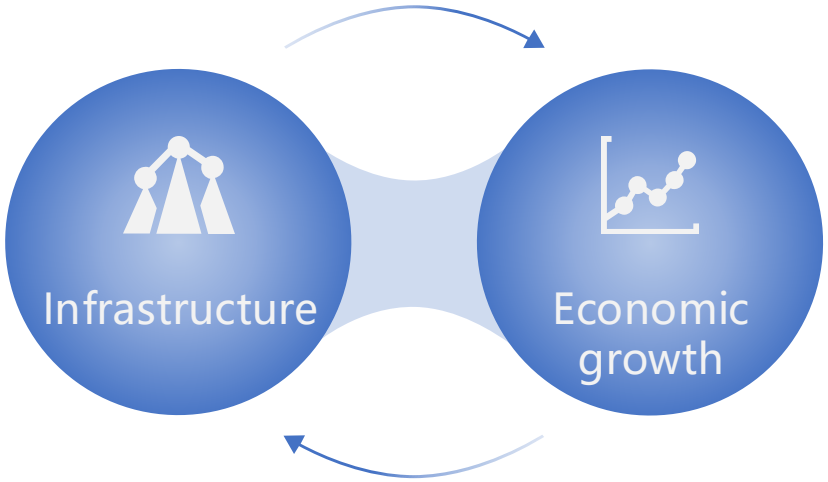
Public Service Category	Description
Energy	Waste-to-energy, photovoltaics, charging piles, biomass energy, coal-fired power, energy storage, etc.
Transportation	Municipal roads, primary highways, secondary highways, transportation hubs, railways (excluding rail transit), airports, ports and terminals, shipping lanes and channels, bridges, etc.
Water	Water diversion and introduction, flood control, reservoirs, irrigation, water conservancy hubs, etc.
Ecological and Environmental Protection	Comprehensive treatment, wetland protection, etc.
Agricultural facilities	Agricultural product trading centers, grain and oil material reserves, etc.
Forestry facilities	Construction of forestry infrastructure
Science and technology infrastructure	Smart cities, information network construction, etc.
Affordable housing	Shack-dwellers' housing renovation, affordable housing, rural dilapidated housing renovation, etc.
Healthcare facilities	Primarily hospitals, public health institutions, etc.
Elderly care facilities	Primarily nursing homes, medical-care integration, elderly apartments, etc.

1.1 Overview of Infrastructure

Infrastructure: Broad and Fragmented

Public Service Category	Description
Educational facilities	Universities, vocational education, ordinary high schools, compulsory education, preschool education, etc.
Cultural facilities	Cultural venues, ancient city protection, cultural relics protection, etc.
Sports facilities	Fitness centers, sports venues, etc.
Civil works	Rail transit, waste disposal, water supply, parking lots, sewage treatment, heating, water supply, municipal roads, pipe networks, sponge cities, power supply, etc.
Government Infrastructure	Government buildings, public safety department venues, training centers, etc.
Urban Comprehensive Development zones	Urbanization construction, park development, land reserves, factory building areas, etc.
Tourism facilities	Eco-tourism, tourism supporting facilities, cultural tourism, sightseeing tourism, agricultural tourism, etc.
Social Security facilities	Disabled service institutions, social welfare institutions, funeral services, employment service institutions, etc.
Other	Projects that cannot be classified into the above categories

Infrastructure and Economic Growth



According to an analysis by Boston Consulting Group (BCG), every **10**$ increase in infrastructure capacity generates **3**$ per annum in extra economic activities.

Source： Love, R., Macoun, A., and Goldsmith, G. (2014). Beyond Budgets: The Real Solution to the Global Infrastructure Gap., Boston Consulting Group. Available at: https://www.bcgperspectives.com/content/articles/public_sector_transportation_travel_tourism_beyond_budgets/

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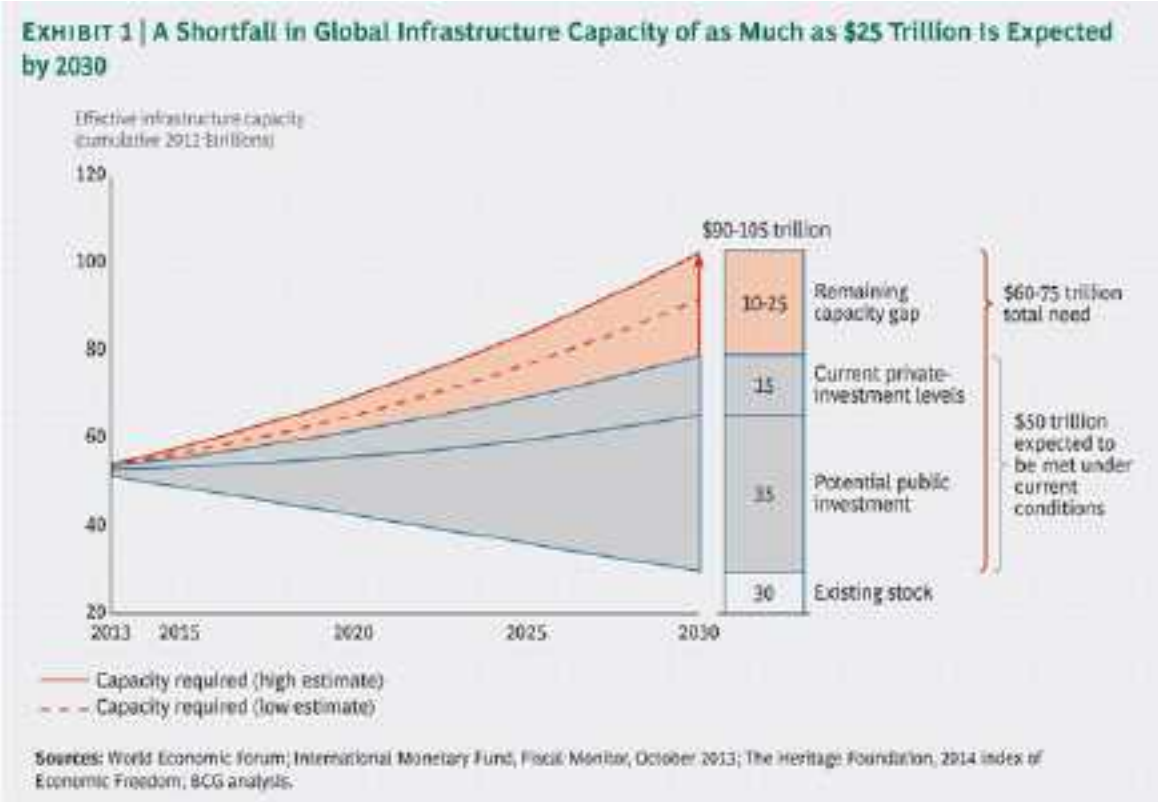
1.1 Overview of Infrastructure

The infrastructure challenge

The size of the global infrastructure investment gap is staggering (right chart).

By 2030, global infrastructure capacity demand is expected to increase by $6-7.5 trillion, but most government balance sheets have reached their limits, with only about $5 trillion available for spending, leaving a $2.5 trillion gap. And this is not just a problem in a few countries; in fact, infrastructure needs improvement in almost every country in the world.



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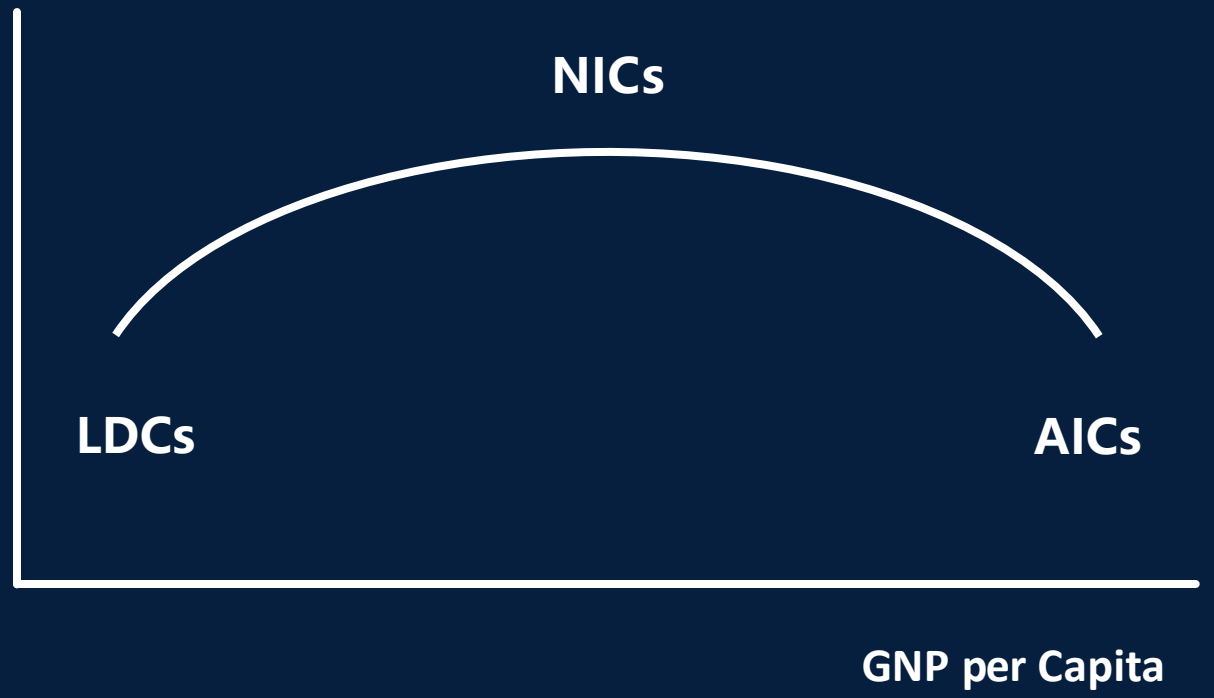
Predict Construction Spending: the Bon Curve

Bon Curve



Bon Curve: The relationship between the proportion of the construction industry in GNP and per capita GNP

LDC: Least Developed Countries

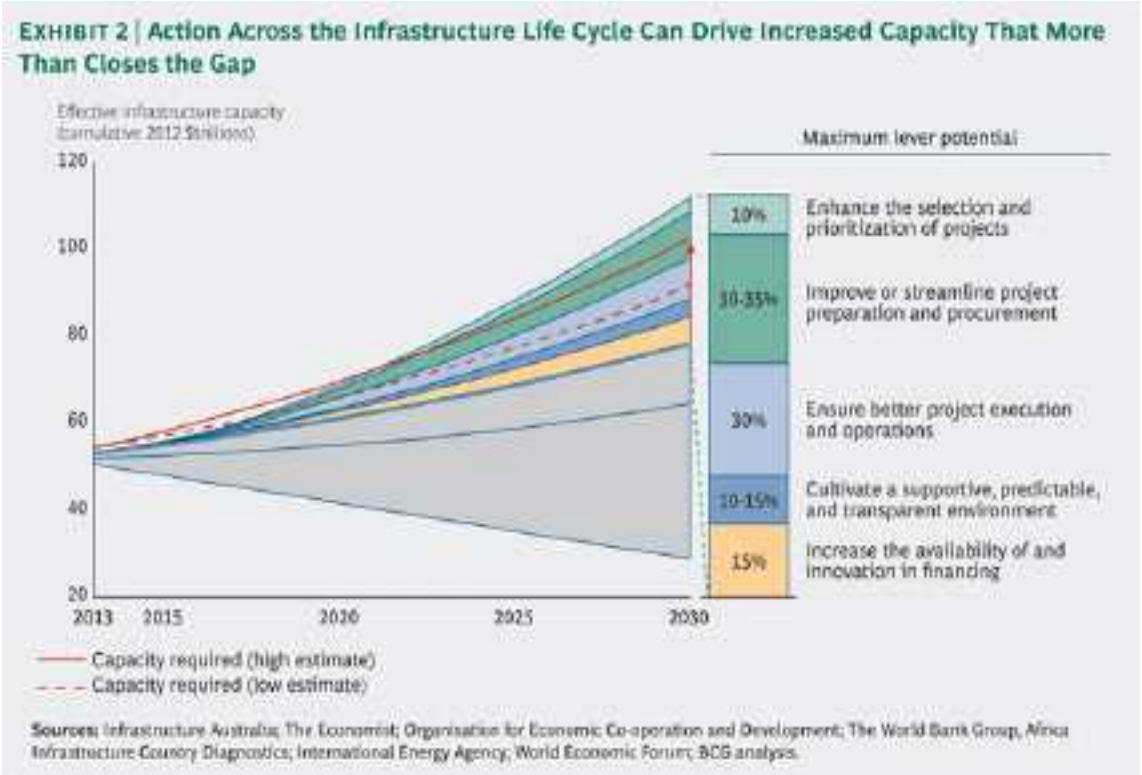
NIC: Newly Industrialized Countries

AIC: Advanced Industrialized Countries

The Infrastructure Challenge

The growing infrastructure gap is increasingly threatening to stall improvements in living standards and global economic growth, with far-reaching implications. Clearly, those countries that can find effective ways to improve infrastructure under fiscal pressure will be the big winners;

So, what are the solutions? Clearly, increasing the availability of private or public funding can play a role. However, our analysis shows that the biggest impact will come from efficiency gains throughout the infrastructure lifecycle (right chart).



Sources：Love, R., Macoun, A., and Goldsmith, G. (2014). Beyond Budgets: The Real Solution to the Global Infrastructure Gap., Boston Consulting Group. Available at: https://www.bcgperspectives.com/content/articles/public_sector_transportation_travel_tourism_beyond_budgets/

1.2 Overview of Infrastructure Investment and Financing

Infrastructure financing

The asterisk (*) signifies that it should be adopted with caution.

NO.	16 Infrastructure Financing Modalities	Current Feasibility
1	Government investment funds	√
2	Local Government General Bonds	√
3	Local Government Special Bonds	√
4	State-owned (financing) platforms*	√
5	Recruitment/Cooperative Construction*	√
6	BT (Build-Transfer) Model	×
7	Reform of State-owned Enterprises by Leasing and Transferring State Assets	×
8	Government procurement of services	×
9	F+ Construction Management Model	×
10	A government fund resembles equity but operates as debt	×
11	Investment + EPC（+ O）*	√
12	PPP	×
13	Franchising/PPP New Mechanism	√
14	Land allocation for construction purposes	√
15	ABO (Concession-Build-Operate) + FEPC/City Partner*	√
16	Infrastructure (Existing) Public Real Estate Investment Trusts (REITs)	√

1.2 Overview of Infrastructure Investment and Financing

Infrastructure financing

- The Mainstream Modality for private participation in infrastructure

2.1 What is PPP

The definition of PPP modality in China

*'PPP is an innovation in the **supply mechanism of public services**, which enables the government to select private sector **with investment, operation and management capabilities** in a **competitive way**. Both parties shall sign a contract based on the principle of equality and accountability. The private sector provides public services and government pays subsidies (if any) to the private sector based on its performance, to **ensure** that private sector receives **reasonable returns**.'*

Source: Guidance on Promoting the PPP modality in the Field of Public Services, May 2015, jointly promulgated by the Ministry of Finance, the Development and Reform Commission, and the People's Bank of China

PPP Logic

Public Sector's Capabilities and Resources

- Responsibilities to citizens
- Supply of public services
- Economic regulation
- Bearing risks beyond the control of the private sector

Private Sector's Capabilities and Resources

- Innovation
- Management capacity
- Efficiency
- Capital

Public Private Partnership

WIN for Public Sector

- New investment
- Economic stimulus
- Government debt control
- High quality infrastructure

WIN for Private Sector

- Profit
- Reputation

PPP or PEP (Public Enterprise Partnership)?

Public Sector

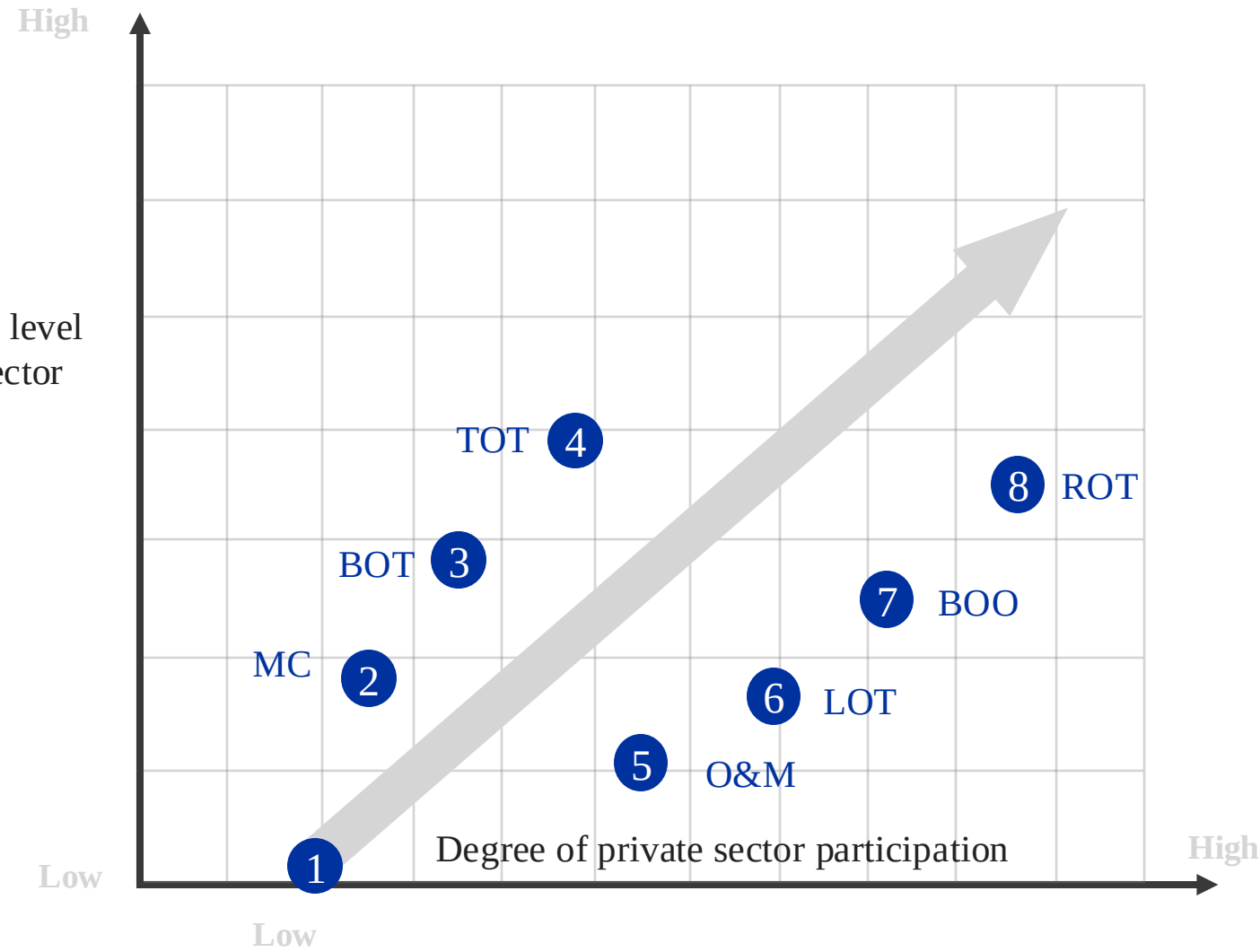
- Government agencies
- Government authorized units

Private Sector

- **State owned enterprises**
- Private enterprises
- Foreign enterprises
- Mixed ownership enterprises

Cause of "Risk Backflow"

PPP Typology



PPP Typology

1. Public project
2. Management Contract
3. Build-Operate-Transfer
4. Transfer-Operate-Transfer
5. Operation & Maintenance
6. Lease-Operate-Transfer
7. Build-Own-Operate
8. Rehabiliate-Operate-Transfer

China’s guru in PPP

UK: Funding methods and contractual arrangements

South Korea : Value for Money (VFM) assessment

China : Learning by doing; knowledge transfer

PPP units

Ministry of Finance PPP Center

The central hub for PPP projects, overseeing national policies, project management, and information dissemination. It ensures projects align with fiscal responsibilities and operational efficiency.

Local PPP Centers

Operate at various administrative levels, facilitating project implementation and providing regional support. They are crucial for project success through localized management and compliance.

PPP project database

- MoF authorized its PPP Centre to be responsible for operating and maintaining the PPP project database.
- The local PPP units are responsible for entry, updating and screening of project data.

Project database

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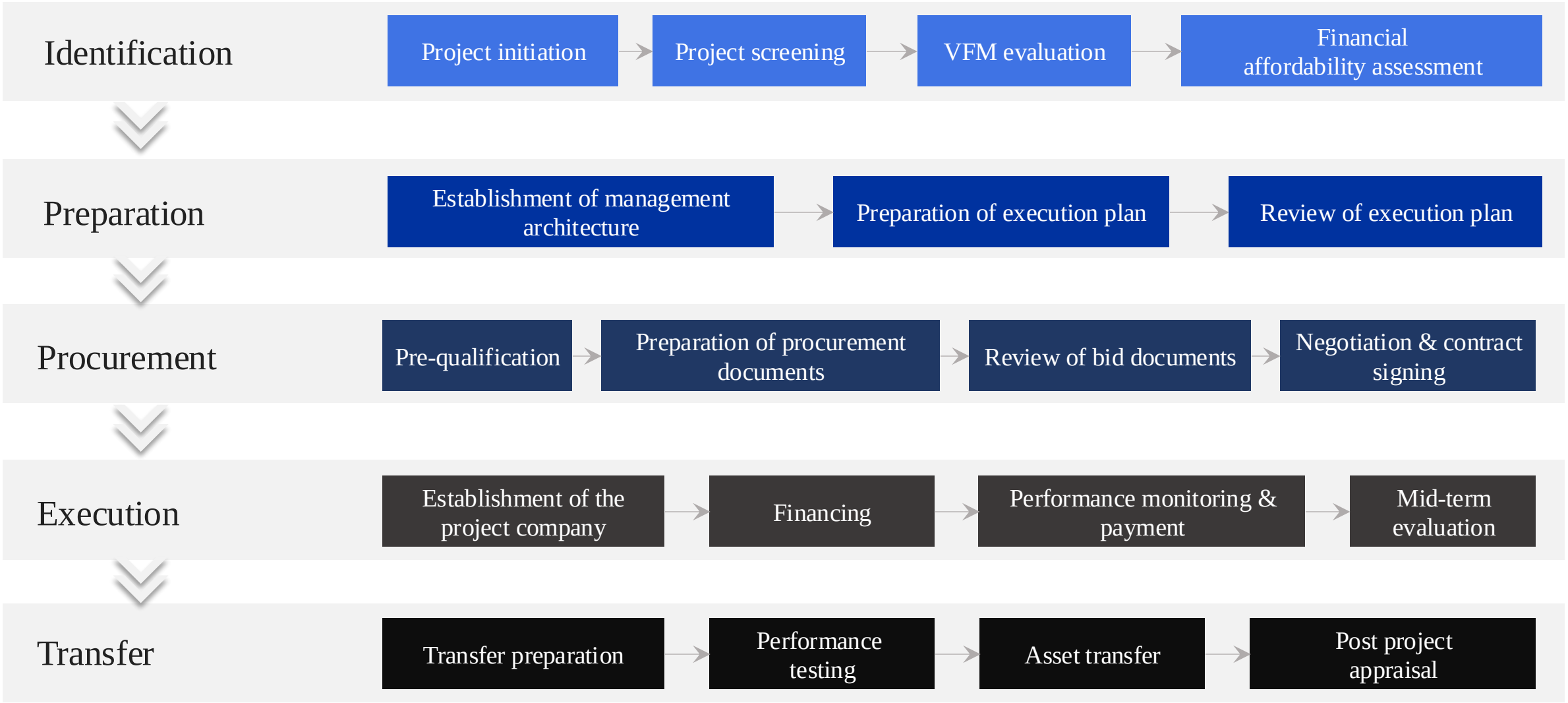
2.3 Typical PPP Operational Process

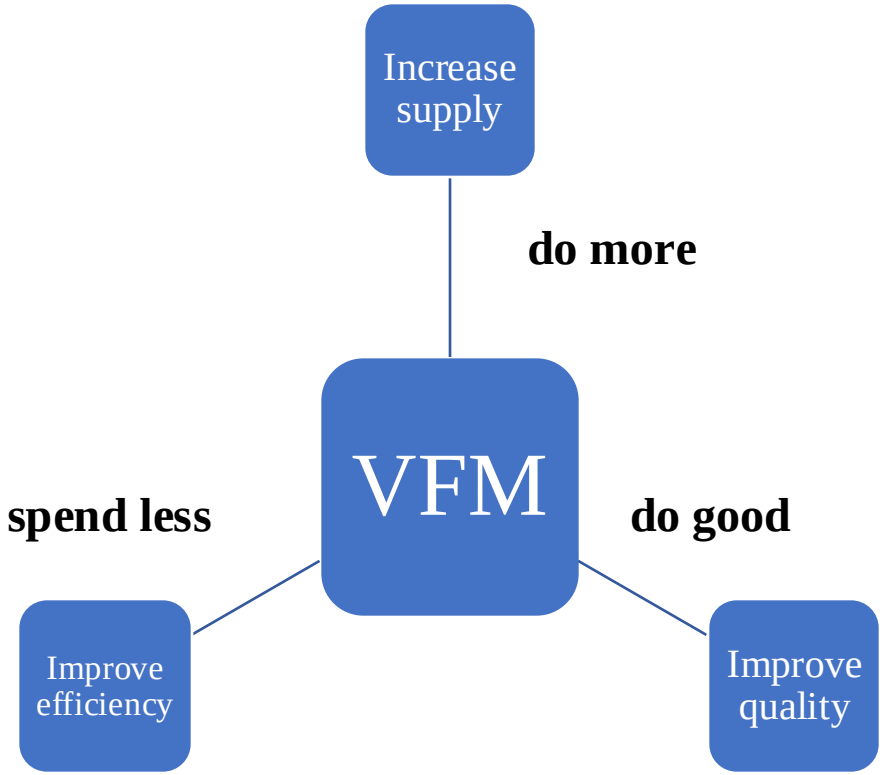
Operational process



2.5 Value for Money (VFM)

What is VFM

- Value for money（VFM）is the core value of PPP and an important concept of government procurement.
- VFM evaluation is an evaluation method to determine whether to use PPP instead of the traditional government procurement method to provide public services



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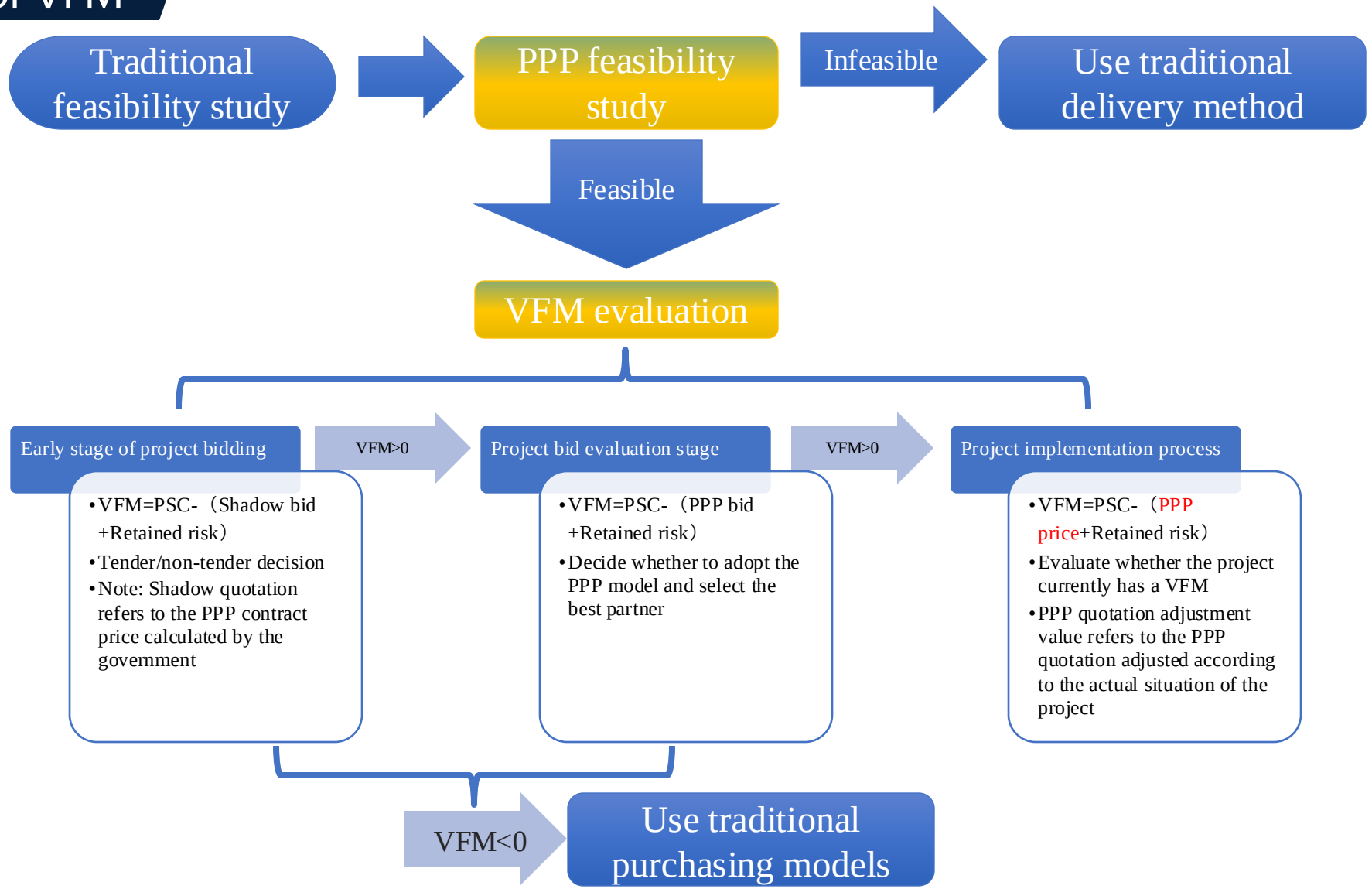
2.5 Value for Money (VFM)

The process of VFM



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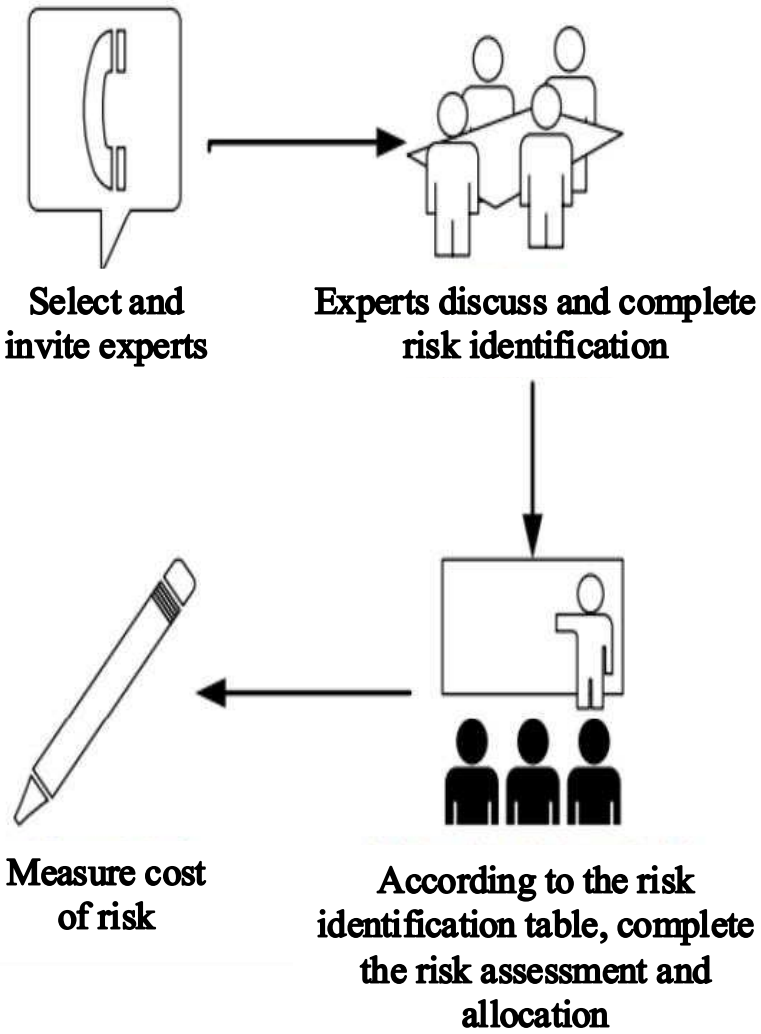
2.5 Value for Money (VFM)

Qualitative evaluation



	Index	Weight	Mark
Basic index	Degree of integration of the whole life cycle		
	Risk identification and allocation		
	Performance-oriented and innovation inspiring		
	Degree of potential competition		
	Government capacity		
	Bankability		
	Basic index subtotal	80%	——
Supplementary index			
	Supplementary index subtotal	20%	
Total		100%	——
Signatures of experts: Date:			

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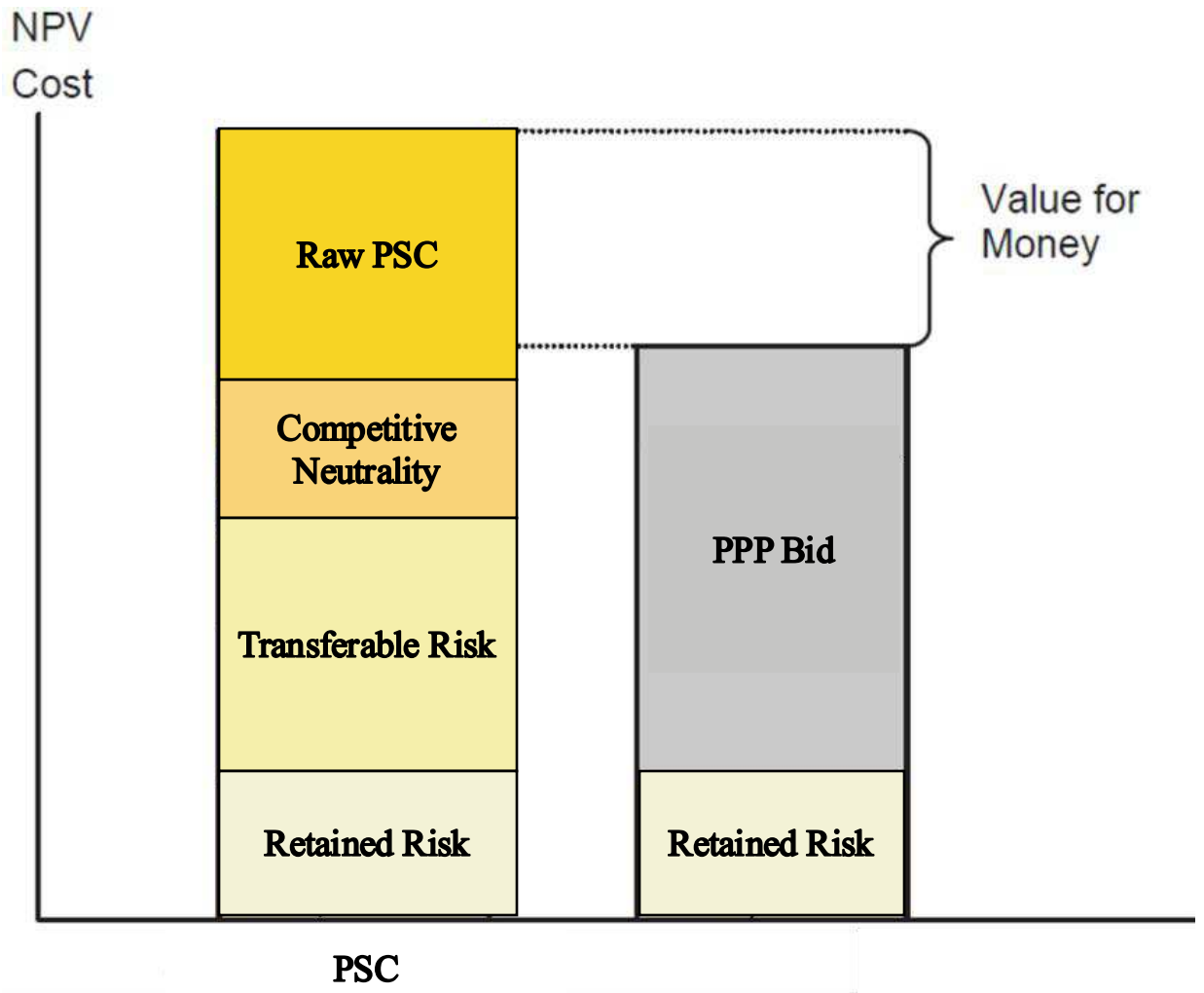
2.5 Value for Money (VFM)

Qualitative evaluation



2.5 Value for Money (VFM)

Risk Evaluation

- Scenario analysis method

Risk name	Risk description	Risk outcome	The basis of risk measurement	The baseline value of risk measurement		Outcome	Probability	Value
Cost overrun risk	The risk that construction cost exceeds budget	Delays in commencement or completion, increased costs	EPC contract price	150000	< Baseline value	-5%	5%	-375
					=Baseline value	0%	10%	0
					Mild cost overrun	15%	50%	11250
					Moderate cost overrun	30%	20%	9000
					Serious cost overrun	40%	15%	9000
					Total		100%	28875

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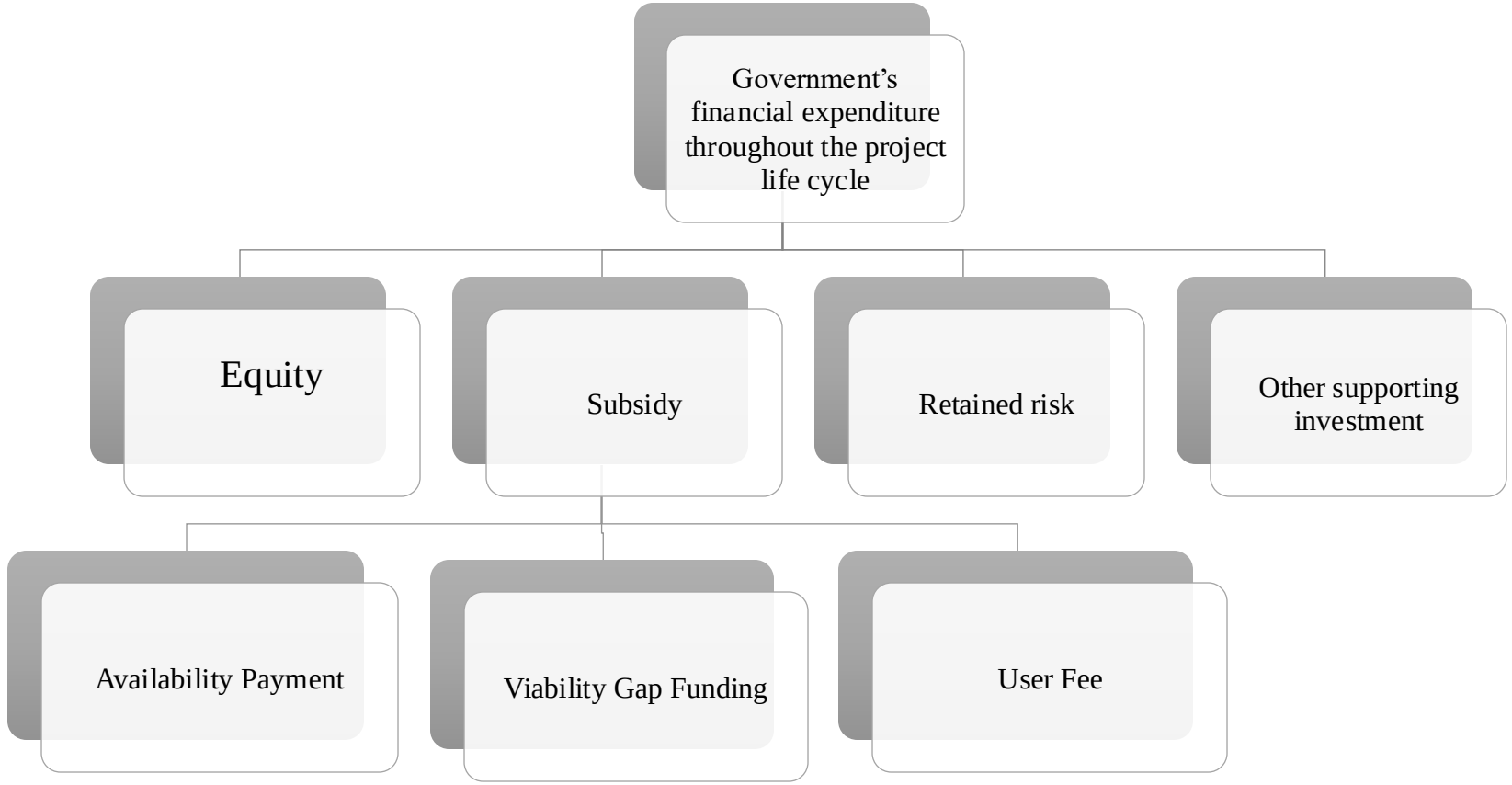
2.6 Financial Affordability Demonstration (FAD)

Responsibility identification

Expenditure measurement

Ability assessment

Information disclosure



2.6 Financial Affordability Assessment (FAA)

The process of FAD

➢ Proportion of Expenditure Responsibility for Proposed PPP Projects in a Certain City.

Year	Estimated General Public Budget Expenditure (in ten thousand yuan)	Growth Rate Forecast	Expenditures of Proposed or Implemented PPP Projects					
			A project of X city (in ten thousand yuan)	B project of X city (in ten thousand yuan)	C project of X city (in ten thousand yuan)	D project of X city (in ten thousand yuan)	E project of X city (in ten thousand yuan)	Expenditure Proportion
2020	748404.36	8%	14286.00	4213.95	2581.71	3840.1	369.09	3.13%
2021	808276.71	8%	14300.00	14021.41	2581.71	3906.26	369.09	4.03%
2022	872938.84	8%	14315.00	14025.96	2581.71	3972.42	3958.17	4.12%
2023	942773.95	8%	14330.00	14031.14	2581.71	4038.58	3948.28	3.82%
2024	1018195.87	8%	14345.00	14035.69	2581.71	4038.58	3937.8	3.54%
2025	1099651.54	8%	14361.00	14040.24	2581.71	4038.58	3926.71	3.28%
2026	1187623.66	8%	14377.00	14044.78	2581.71	4102.45	3914.96	3.04%
2027	1282633.56	8%		14049.98	2581.71	4102.45	3902.52	1.78%
2028	1385244.24	8%		14055.18	2581.71	4102.45	3889.36	1.65%
2029	1496063.78	8%		14060.37	2581.71	4169.51	3875.44	1.53%
2030	1615748.88	8%		15743.88	2581.71	4169.51	3860.72	1.51%
2031	1745008.79	8%		14070.76	2581.71	4169.51	3845.16	1.31%
2032	1884609.49	8%		14076.61	2581.71	4239.92	3700.45	1.21%
2033	2035378.25	8%		14082.46	2581.71	4239.92	3683.07	1.12%
2034	2198208.51	8%		14087.65	2581.71	4239.92	3664.71	1.04%
2035	2374065.20	8%		14093.50	0.00	4313.85	3645.32	0.86%

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3.1 The Two Phases of PPP

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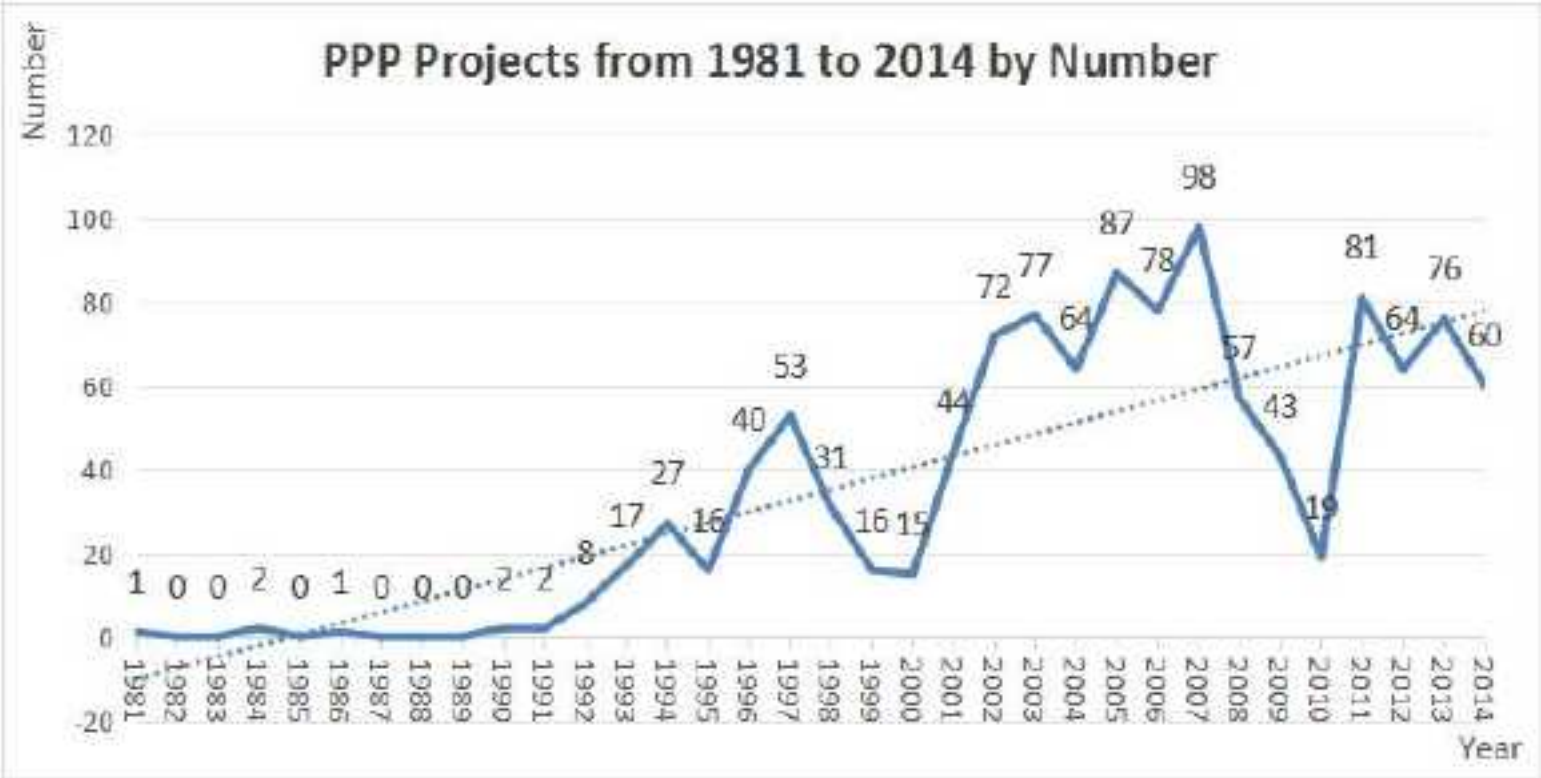
3.2 Development of PPP (1981-2014)

Chronology of PPP (up to 2014)

- PPP Projects from 1981 to 2014 by number (source: World Bank PPI Data Set)



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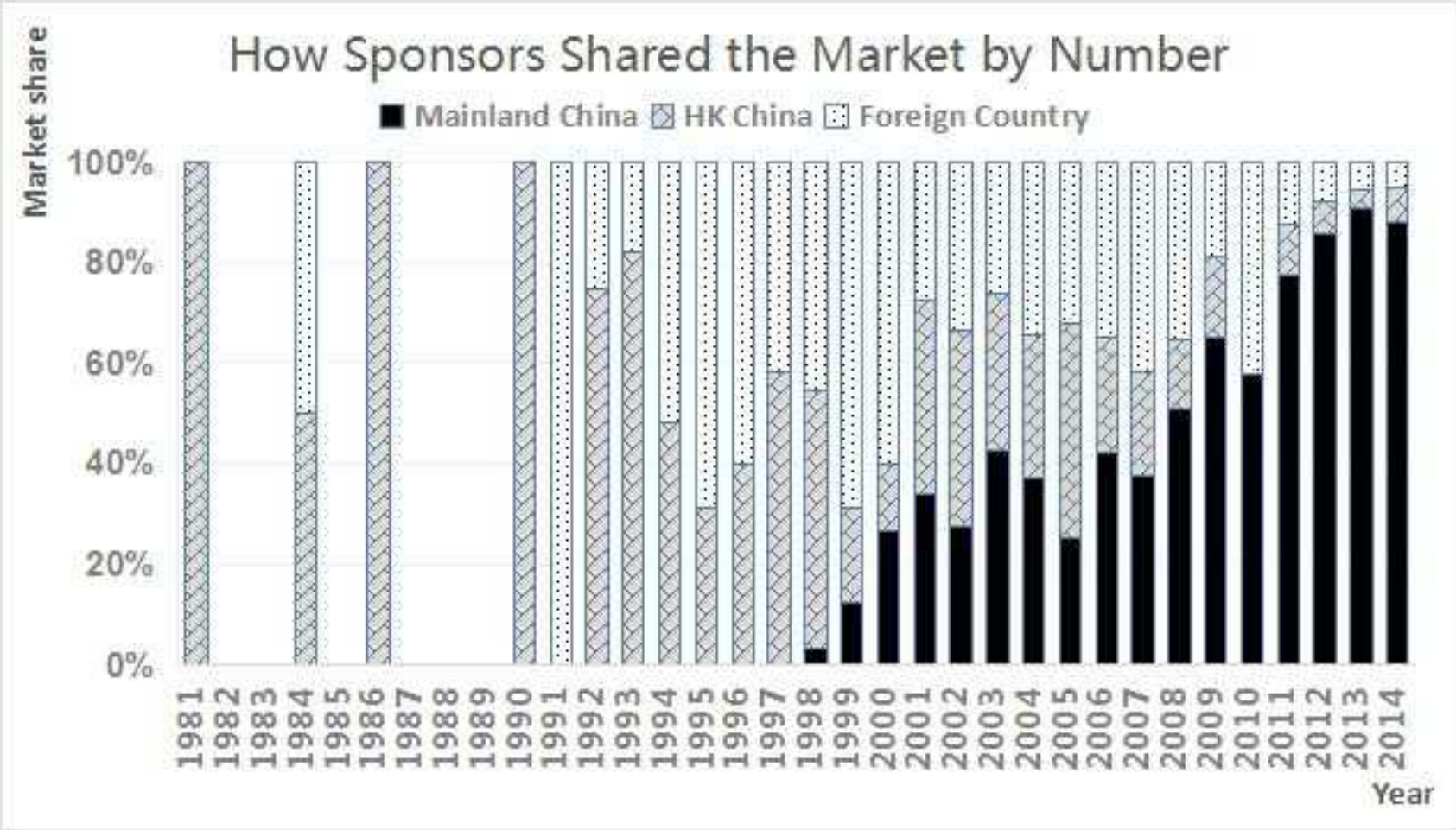
3.2 Development of PPP (1981-2014)

Market distribution in the world



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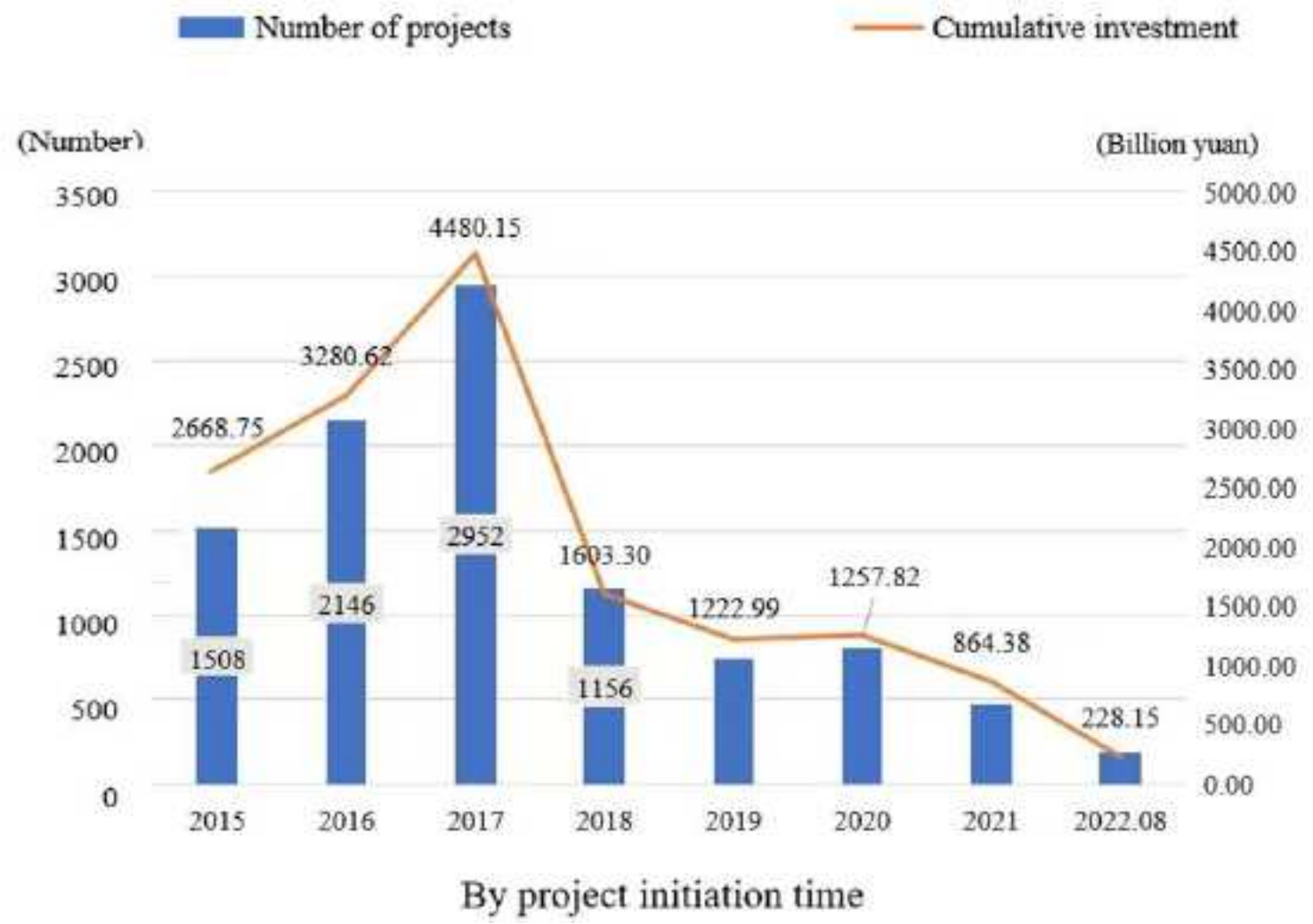
3.3 Development of PPP (After 2014)

Chronology of Chinese PPP projects



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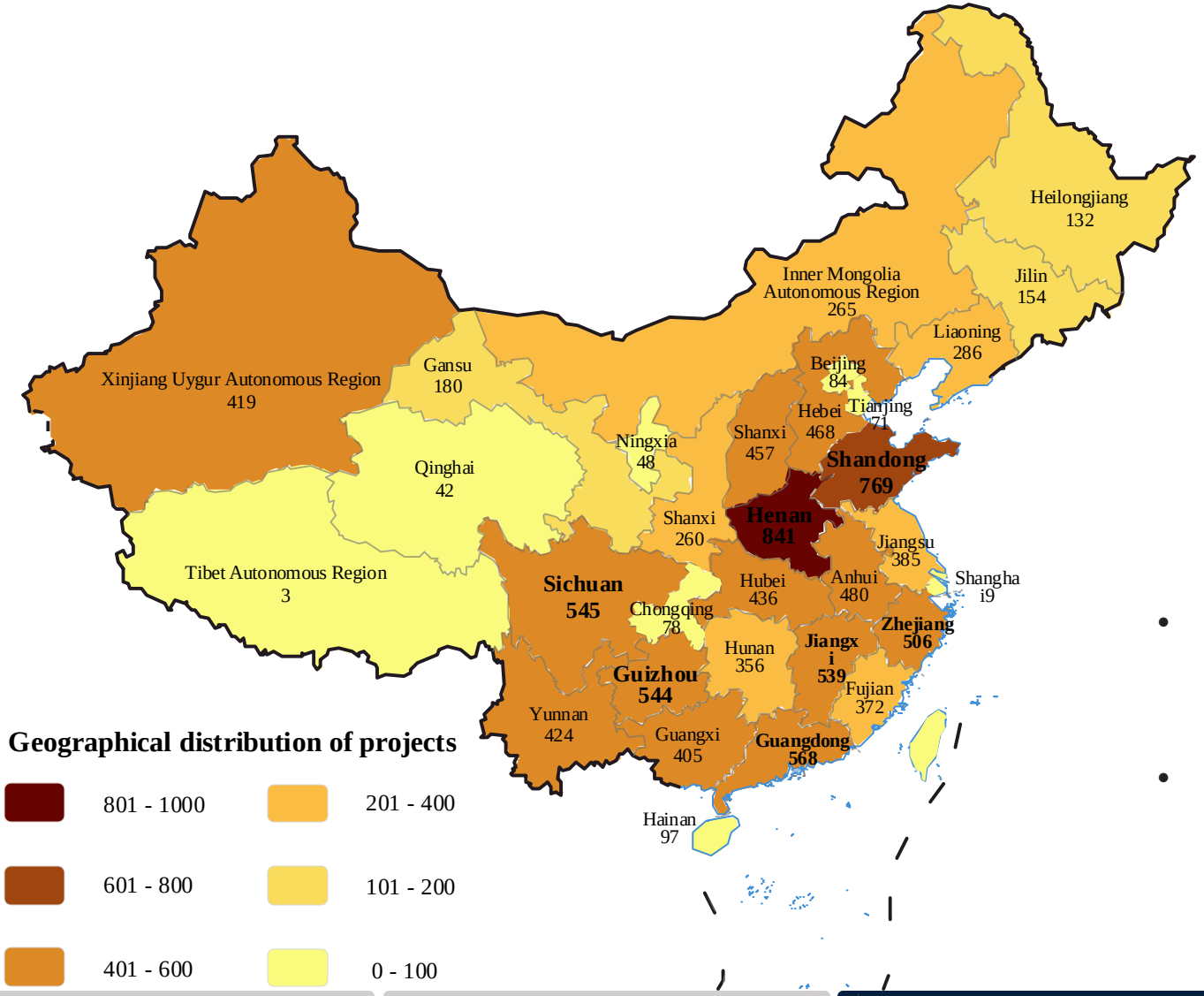
3.3 Development of PPP (After 2014)

Geographical distribution of PPP in China



- By August 30, 2022, there were 10,223 projects put into storage, with a total investment of 16.22 trillion yuan.
- Distributed in 32 provinces / municipalities / autonomous regions.

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4.1 Case Study: Ziyang Airport Economic Zone

Location: Ziyang Airport Economic Zone (Sichuan, China)

Investment Amount: 49 Billion RMB

Duration: 20 Years

Mode: BOT

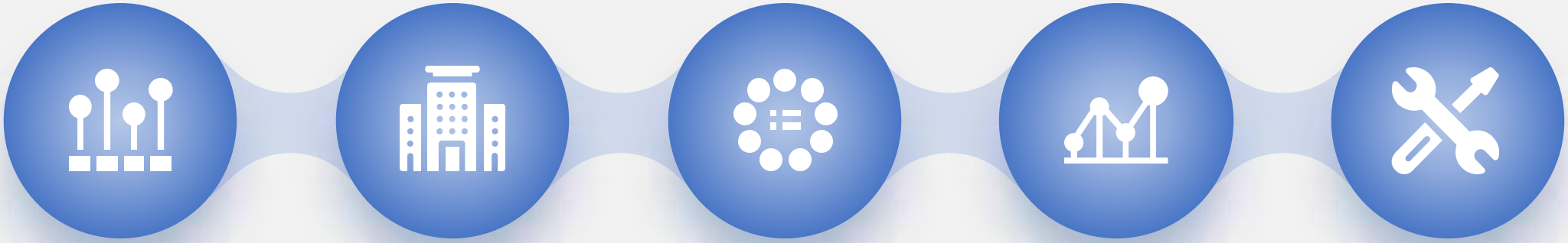
▼ Scope of Cooperation

Public Service Facilities Construction

Construction of public service facilities covers parks, green spaces, culture, sports, and healthcare.

Industrial Development Services

This refers to conducting research on industrial positioning and development, and facilitating investment promotion.



Infrastructure Construction

It includes land leveling, municipal facilities, communication facilities, roads and bridges.

Plan & Design Consulting Service

It relates to the overall project development and planning.

Project Operation & Maintenance

Works such as road cleaning, maintenance are covered in this part.

4.1 Case Study: Ziyang Airport Economic Zone

Return mechanism

This case is a comprehensive development project, with some quasi operational public infrastructure projects and fee based operating services included in the project group, such as integrated water supply and drainage facilities, underground comprehensive management, education and healthcare facilities, property services, etc. Therefore, the overall return mechanism of this project belongs to the VGF category. Non operating parts are "government payment", while quasi operating parts are VGF.

Project	Return level	Payment	Payment period
Project Capital			
Infrastructure and public service	7% (Annual)	Linear	From operation start to the end
Plan & design consulting service	10% (Total)	Linear	Average payment in 10 years
Other operational projects (acquisition and demolition)	8.4% (Annual)	Linear	Payment completed in 10 years
Project Financing			
Infrastructure and public service	5.88% (Interest)	Linear	From operation start to the end
Other operational projects (acquisition and demolition)	5.88% (Interest)	Linear	Payment completed in 10 years

Note: 1) The financing funds shall be calculated based on the actual financing cost and shall not exceed a 20% increase in the benchmark interest rate for loans over five years announced by the People's Bank of China during the same period. 2) industry import service fees are treated independently.

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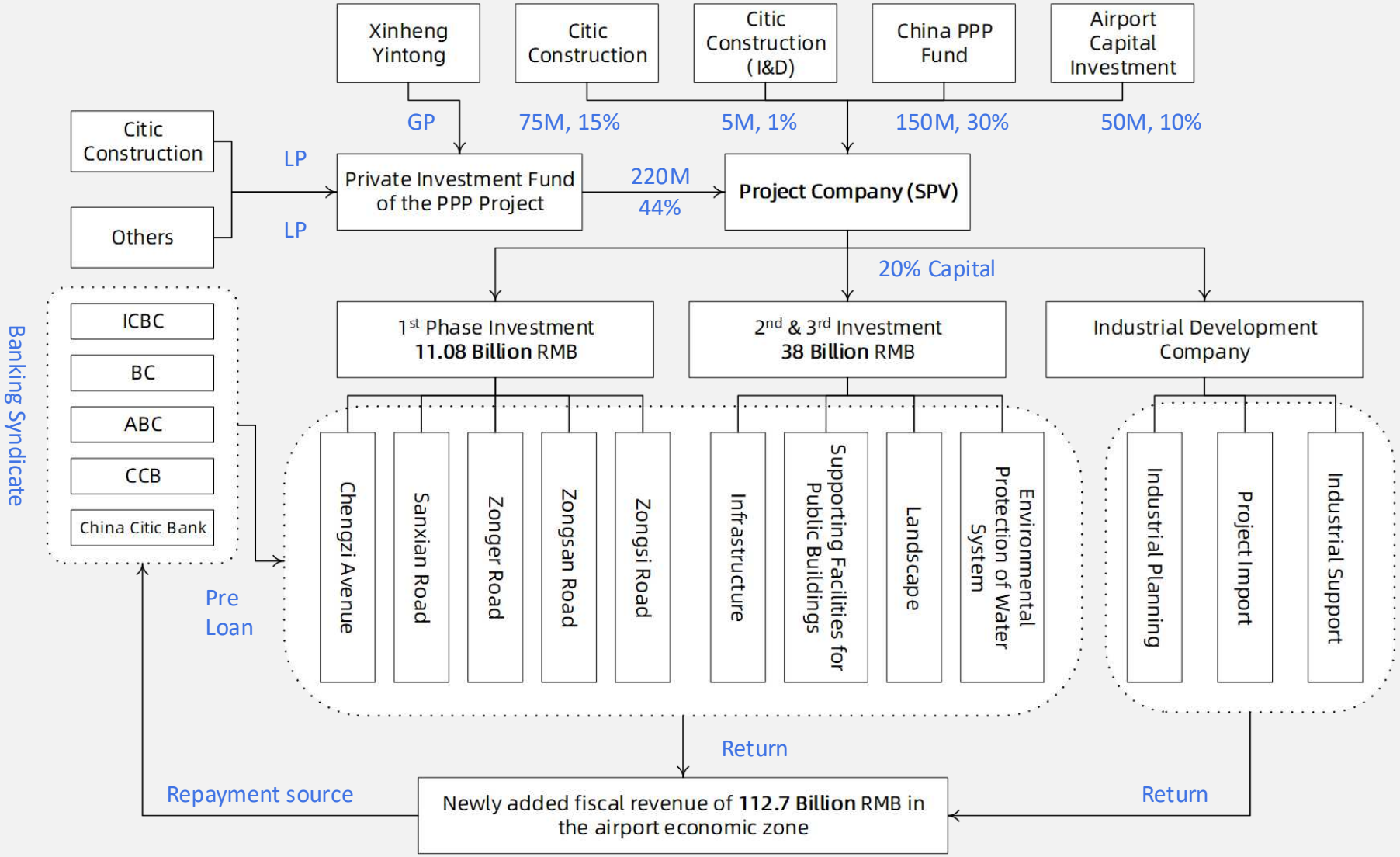
4.1 Case Study: Ziyang Airport Economic Zone

Investment and financing structure



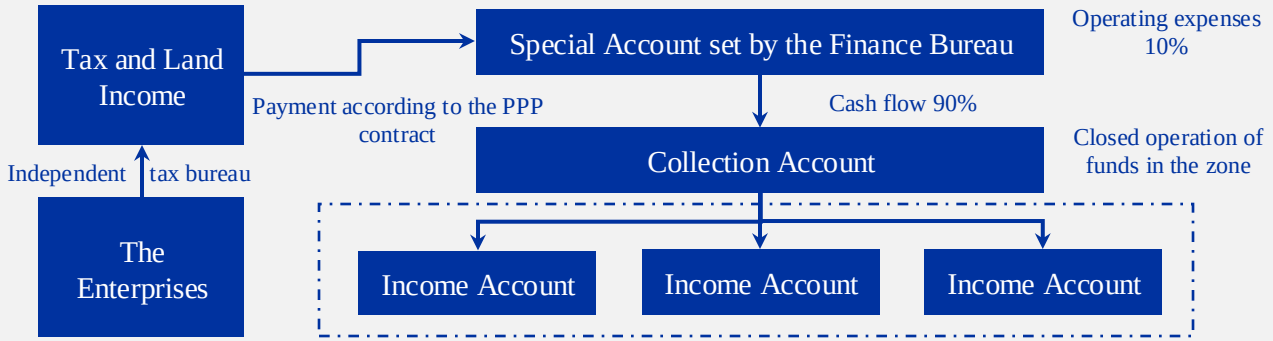
Three key success factors of the project

Point A: Strategic alignment of scope and schedule

- Adhering to the systematic development concept of "revitalizing the city through industry, promoting industry through city, integrating industry and city, and integrating urban and rural areas", we **focus on** six cooperation areas**: planning and design, land consolidation, infrastructure construction, public supporting construction, industrial development, and urban operation**, and provide a comprehensive solution for sustainable development throughout the entire process for the region.
- **Phased construction and rolling development**, the construction period of the sub project shall be determined by both parties through consultation based on the actual situation. The operation period of the sub project shall be from the day after the completion and acceptance of the sub project to the expiration of the cooperation period of this project.
- **Linking the revenue of the cooperating units with the introduction of industries**, promoting the consistency of the starting and target points of both parties, forming a community of interests, effectively promoting the construction and operation of industrial new towns, and achieving maximum social benefits.

Point B: Financial feasibility based on streamlining construction expenditure, land sales and tax income

- Adopting the innovative park PPP model, using the financial revenue generated within the closed area of the park as the source of payment, effectively solves the financial shortage problem faced in the traditional PPP model, especially for large-scale investment in Ziyang Park development projects.
- **Dividing revenue and expenditure, special settlement, closed operation, and self balancing.**



Point C: Involving top consulting companies

Boston Consulting Group
Introducing top international industry consulting agencies to prepare industrial plans

Roca Consulting
Introducing third-party professional institutions to scientifically guide the entire process of PPP model demonstration

Beijing Chuanrui & Beijing Xingcai
Establishing a comprehensive project information management system to promote informatization level

Cushman & Wakefield
Introducing international consulting agencies for land assessment and development positioning

5.1 The Successful Experience

- Comprehensively assimilated domestic and international expertise
- Capacity building
- Engaged top experts and consulting firms
- Established rigorous and transparent project operational procedures
- Facilitated experience exchange through demonstration projects

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5.2 Lessons Learned

- Institutional issues

(Absence of a dedicated PPP law, an underdeveloped policy framework, coarse and imprecise contract documentation)

- Bankability
- Insufficient revenue from end users
- Dominance of SOEs

Q & A

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