

"Internet +" and infrastructure construction financing under the background of the Belt and Road

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Abstracts: Internet was born in 1969, now it has infiltrated every aspect of people's life, The development of the Belt and Road is also inseparable from the Internet. Since "The Belt and Road" was put forward in 2013, on the one hand, it has made many achievements, such as Gigan Bernini Bridge, Tau road, Kuala Lumpur subway, Philippines route and so on. On the other hand, there were some problems in infrastructure construction financing also, such as the channels of financing was limited, financing demand was difficult to meet and the gap between actual financing and ideal financing was huge. Combining the Internet with infrastructure financing may be a shortcut to infrastructure financing of the countries along the Belt and Road. We used comparative analysis and case analysis by querying the National Statistical Yearbook, the network of the Belt and Road and combining the statistical data and research reports of authoritative organizations (such as the World Bank and ADB) to expound the current situation, existing problems and the reasons, estimate the scale of financing and put forward how to solve these difficulties by "Internet+", designed to make people deeply understand this issue, and contribute to the resolution of related issues.

1. Introduction

Since building the "Silk Road Economic Belt" was proposed by Xi Jinping when he gave the speech in Kazakhstan on September 2013, The Belt and Road has developed rapidly with the support of the state. So far, six silk roads including the ground, sea, air, energy, electricity, information have developed together and achieved great success. Infrastructure construction and financing which can't be neglected, is proportional to economic development, their relevance up to 83.8% in regression analysis [1]. The problems, many countries along the Belt and Road facing a shortage of infrastructure funds, need to be solved urgently, While relating research is little, there are only 7 journals containing the keywords of "The Belt and Road", "Infrastructure", "Financing" in CNKI.

This report uses the comparative analysis and case analysis to analyse the situation of infrastructure financing along the line by querying the National Statistical Yearbook, The network of the Belt and Road and combining the statistical data and research reports of authoritative organizations (such as the World Bank and ADB). Designed to make people understand this

problem deeply, and give a hand to solve. This report will benefit solving this problem, mobilize various subjects to join infrastructure financing, run it long. In addition, the scale-estimating of financing have a reference for some countries.

2. Current Situation of Infrastructure Construction Financing

2.1. The Amount of Financing Grows Continuously and Internal and External Investment Balance is Different

The volume of infrastructure financing grow continuously, but there are also different internal and external investment problems among different countries. Take China and India for example, in 2010-2015, curve of China using foreign direct investement is flat, while India is more steep; China using foreign direct investment curve is steep, but India is more gentle (Figure 1, Figure 2).

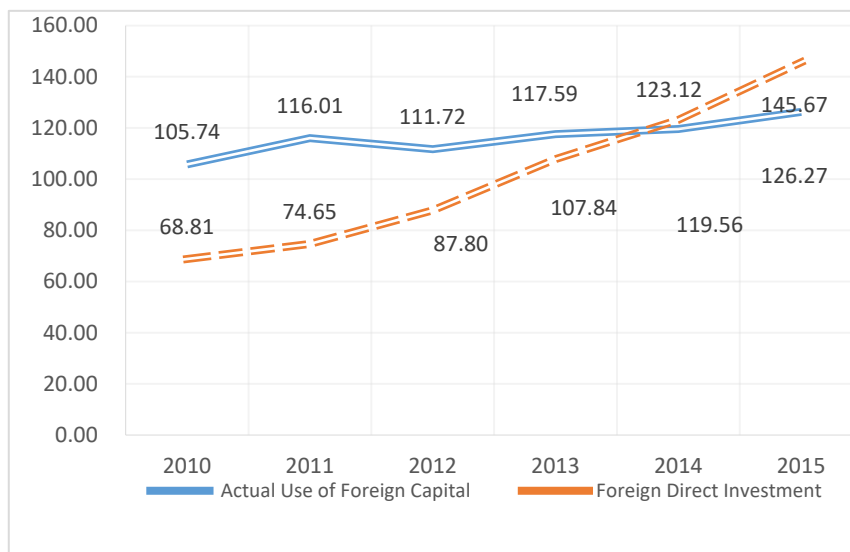


Figure 1: A Comparison of Domestic and Foreign Investment in China (¥hundred million).

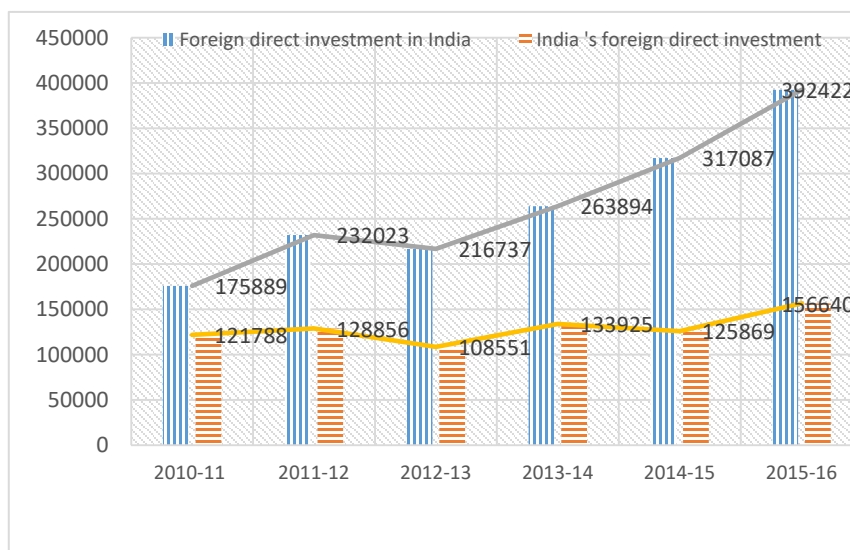


Figure 2 ndia 's international investment(₹billion).

2.2. Most of the Financing Channels are Domestic with Little Amount of Foreign Financing

There are three main providers for infrastructure funds: domestic, Hong Kong/Macao/Taiwan and foreign. The number of investment in China's education is 772.32 billion yuan in 2015, accounting for 99.39% of domestic capital, while foreign investment accounted for only 0.20%. The situation of water conservancy and other four core infrastructure is same (Figure 3, Figure 4), absolutely, China's infrastructure funds are mainly from the domestic.

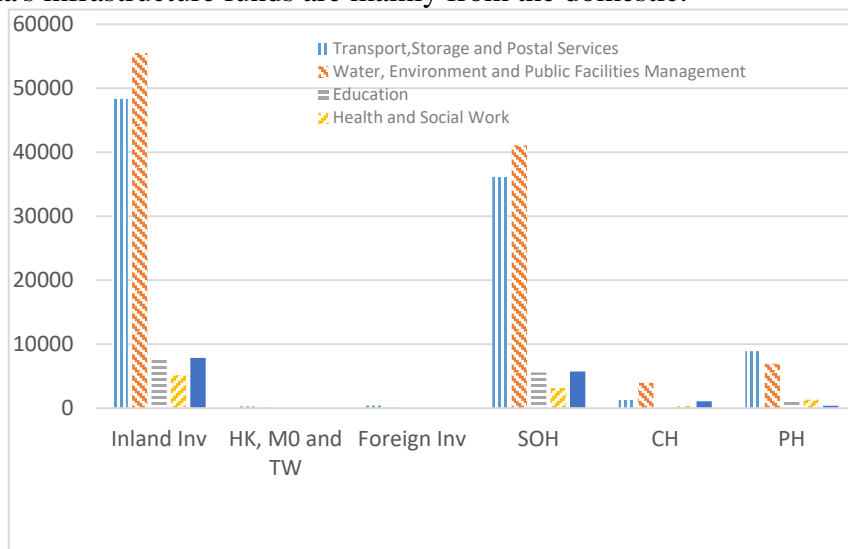


Figure 3 Partial Infrastructure Financing Situation (¥hundred million).

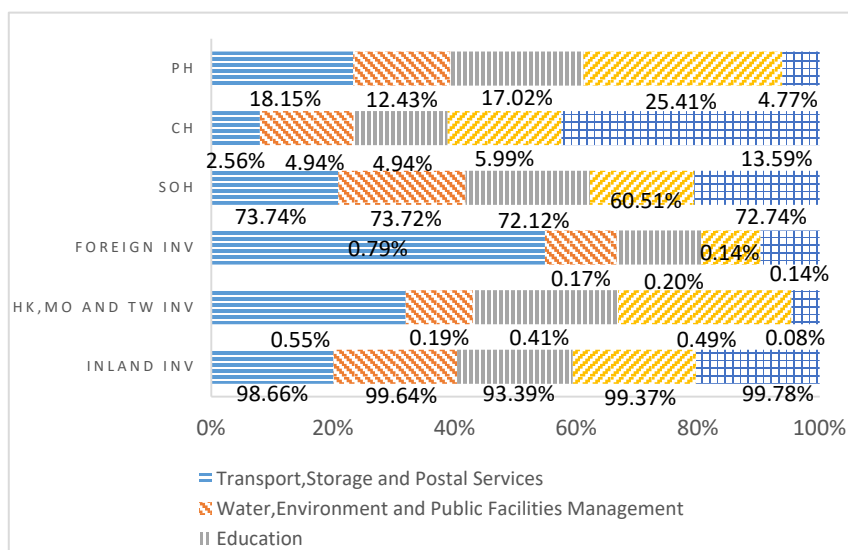


Figure 4 China's infrastructure investment as% of Total in 2015.

2.3. Majorities of Funds are Provided by State and the Private Sector's Investment is Little

From the nature of the input subject, there are three types of investment: state-owned, collective and private holdings, the most proportion was accounted for state-owned, private sector's proportion is very small. In 2015, education investment's proportion of state-owned holdings and collective holdings each accounted for 72.12% and 4.94% for total, while private holdings only

accounted for 17.02%, the minimum proportion of private sector investment was only 4.77% for other four core infrastructure.

According to the data of World Bank in 2016, the Indonesian’s infrastructure funds are mainly from the government and state-owned enterprises, the private sector investment is little. Although the share of government and state-owned enterprises investment’s proportion had a slight decrease in 2010-2015, it’s still around 90%, while private sector investment remained at only about 10% in five years (Figure 5).

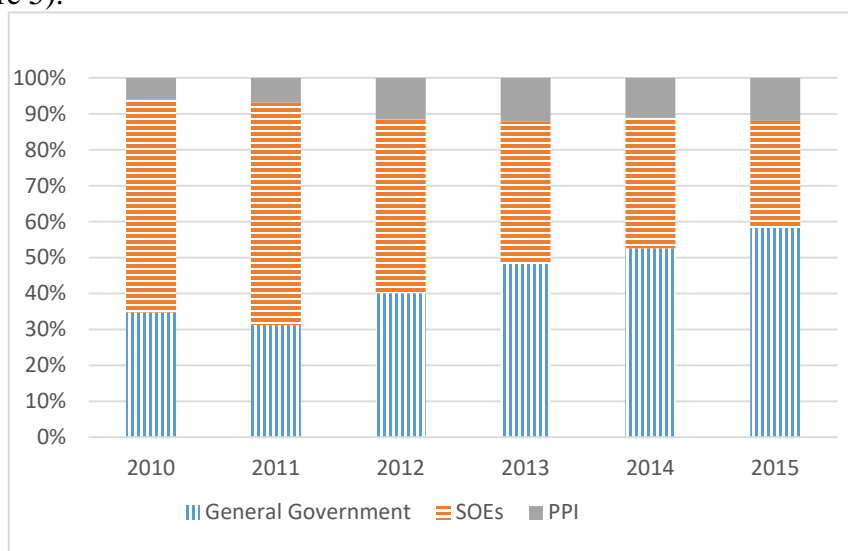


Figure 5 Breakdown of Infrastructure Investment in Indonesia by Investor Type, 2010-2015.

3. Problems of the Belt and Road in Infrastructure Construction

3.1. Financing Demand is Large While the Number is Difficult to Meet

Table 1 Estimated Infrastructure Investments and Gaps, 25 DMCs, 2016–2020(\$ billion in 2015 prices).

Country/Type	Estimated Current Investment(2015)	Baseline Estimates			Climate-adjusted Estimates		
		Annual Needs	Gap	Gap(% of GDP)	Annual Needs	Gap	Gap(% of GDP)
Total (25)	881	1211	330	1.7	1340	459	2.4
Total without PRC (24)	195	457	262	4.3	308	308	5.0
Selected Central Asia Countries (3)	6	11	5	2.3	7	7	3.1
Selected South Asia Countries (8)	134	294	160	4.7	195	195	5.7
Selected Southeast Asia Countries (7)	55	147	92	3.8	102	102	4.1
Selected Pacific Countries (5)	1	2	1	6.2	2	2	6.9
India	118	230	112	4.1	144	144	5.3
Indonesia	23	70	47	4.7	51	51	5.1
PRC	686	753	68	0.5	151	151	1.2

The World Bank and the Asian Development Bank (ADB) estimated the financing gap of 25

developing countries in Asia, the current total investment of 25 countries was \$881 billion and for keeping the Baseline(Baseline Estimates) and adapting climate(Climate-adjusted Estimates), annual financing needs to be \$2551 billion, There exist \$1670 billion gap. And China's gap up to \$219 billion, accounting for 1.7% of GDP, the remained 24 countries' gap is \$570 billion, accounting for 9.3% of GDP. Follow this, both China and other countries along the" Belt and Road" also have large demand in infrastructure financing, the gap is huge and the total demand is difficult to meet. (Table 1)

3.2. Imbalance between Countries and Regions

Due to the political, economic, cultural, historical and other factors are different, the levels of economic development are not same in different countries also, the infrastructure financing exist obviously imbalance [2]. Imbalance of one country's GDP can reflects the imbalance in infrastructure financing from one side, the per capita GDP of Poland in 2015 was \$12494.47, while India is only \$1581.59. And according to statistical data: Polish's infrastructure financing was \$4.42 billion in 2015, while India was only \$1.93 billion. (Figure 6, Figure 7)

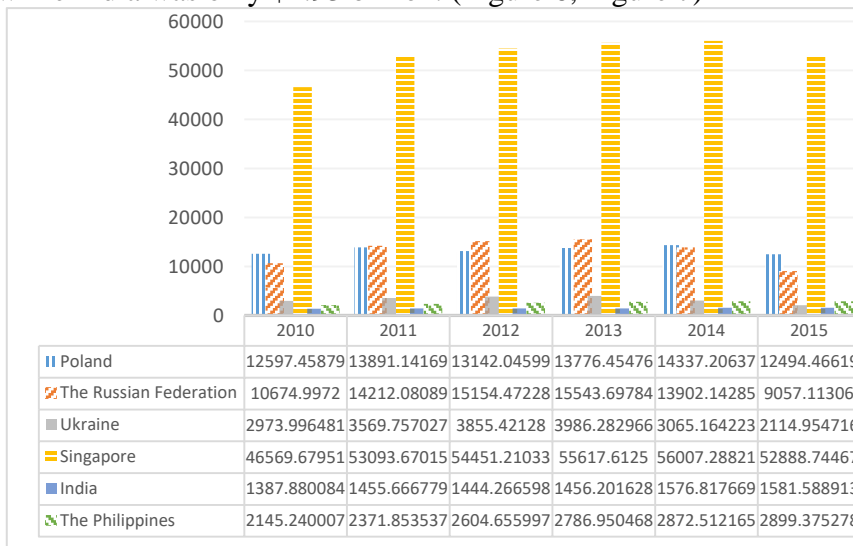


Figure 6 Per capita GDP in some countries (\$hundred million).

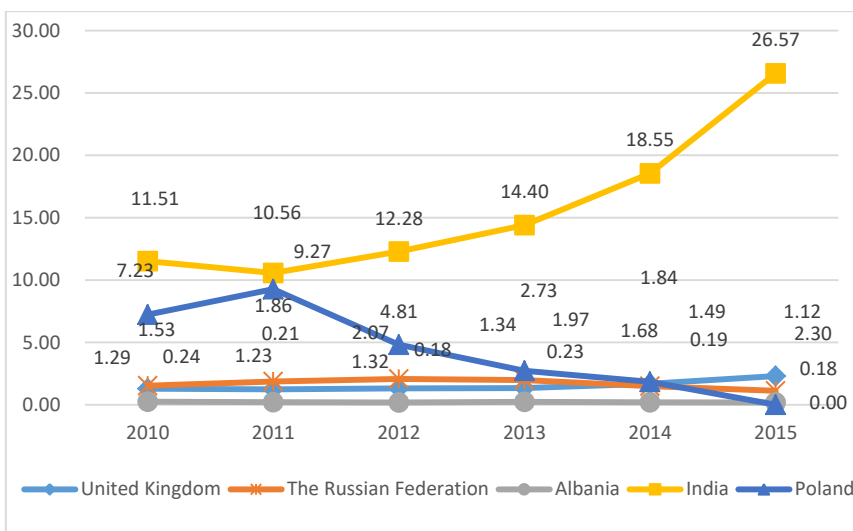


Figure 7 Some countries' transport infrastructure financing situation (€billion).

3.3. Private Capital Investment can be Further Strengthened

Infrastructure as public products, with non-profit feature, there are few profit departments will invest and build infrastructure. Take China's infrastructure financing in 2015 for example, the private holdings in education financing were 17.02%. In fact, the highest proportion was 25.41% in private holdings of the five types of infrastructure financing (Table 2, Figure 9), so investment of private capital need to be further strengthened.

Table 2 China's Partial Infrastructure Financing in 2015(¥hundred million).

Name/Type	Inland Inv	HK,MO and TW Inv	Foreign Inv	SOH	CH	PH
Transport, Storage and Postal Services	48320.1	268.3	386.5	36114.5	1255	8887.3
Water, Environment and Public Facilities Management	55479.1	105.1	94.8	41047.3	3939	6922.9
Education	7676.3	31.8	15.1	5569.7	381.2	1232.2
Health and Social Work	5142.2	25.6	7	3131.2	310.2	1314.8
Public administration,Social Security and Organization	7833.6	6.3	11.1	5710.6	1066.7	374.5

3.4. Insufficient Cooperation between Regions

In 2015, foreign investment of core infrastructure in China accounted for 0.14%-0.79% of the total financing, while the domestic capital accounted for more than 99.30% (Table 2, Figure 9). There had a serious imbalance in internal and external financing, and the degree of cooperation among the countries along the line should be further strengthened.

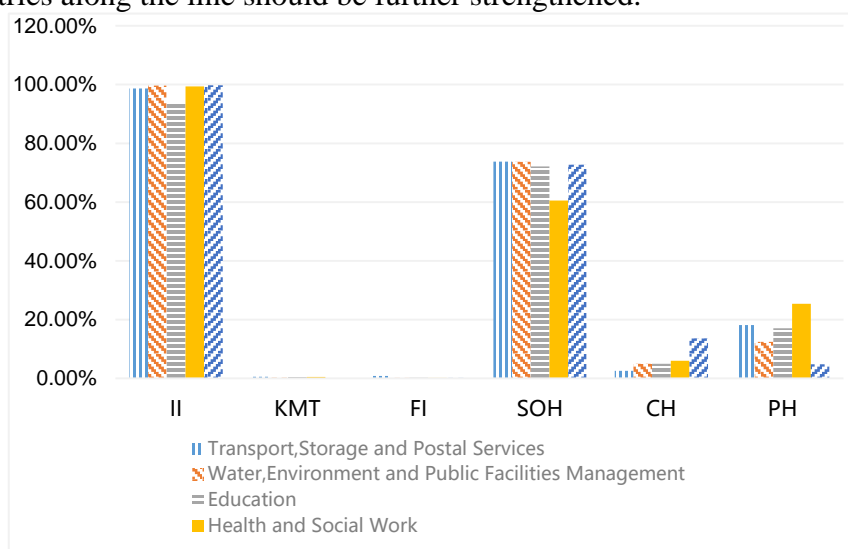


Figure 8 China's infrastructure investment as% of Total in 2015.

4. Estimation of Financing Scale of the Belt and Road’s Infrastructure

4.1. Overall Estimation of Financing Scale

According to two factors-baseline and climate-adjusted, the United Nations (UN) (2015 Revision of World Population Prospects [3]) and the Asian Development Bank (ADB) discussed the infrastructure costs of maintaining Baseline and adapting weather changing. Based on the projections of GDP growth, population growth and per capita GDP in 2030 estimated Asia and the Pacific region should invest \$48717 billion, annual investment is \$3247 billion, accounting for about 11.0% of GDP (Figure 9, Table 3).

Table 3 Estimated Infrastructure Investment Needs by Region, 45 DMCs, 2016-2030(\$billion in 2015 prices).

Region/Subregion	Projected Annual GDP Growth	2030 UN Population Projection (billion)	2030 Projected GDP Per Capita (2015 \$)	Baseline Estimates			Climate-adjusted Estimates		
				Investment Needs	Annual Average	Investment Needs as % of GDP	Investment Needs	Annual Average	Investment Needs as % of GDP
Central Asia	3.1	0.096	6202	492	33	6.8	565	38	7.8
East Asia	5.1	1.503	18602	13781	919	4.5	16062	1071	5.2
South Asia	6.5	2.059	3446	5477	365	7.6	6347	423	8.8
Southeast Asia	5.1	0.723	7040	2759	184	5.0	3147	210	5.7
The Pacific	3.1	0.014	2889	42	3	8.2	46	3.1	9.1
Asia and the Pacific	5.3	4.396	9277	22551	1503	5.1	26166	1744	5.9

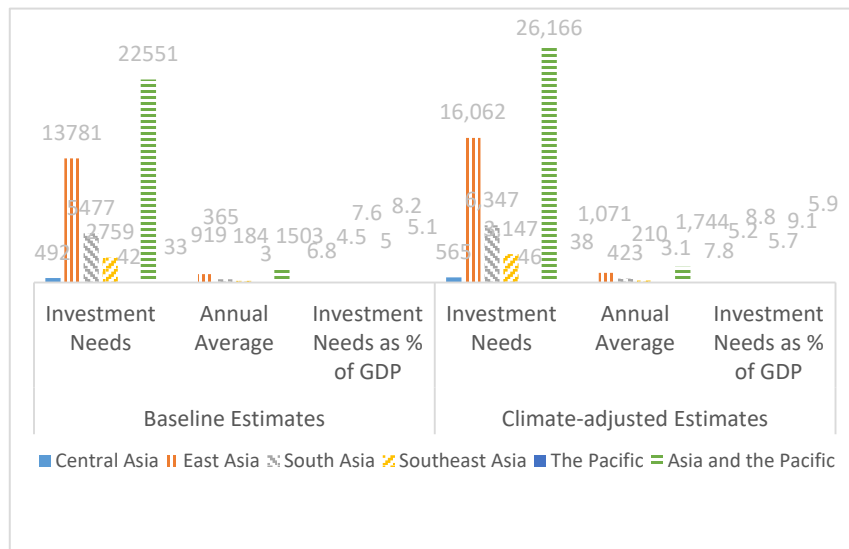


Figure 9 Estimated Infrastructure Investment Needs by Region, 2016–2030(\$ billion).

4.2. Estimation of Financing Scale for Some Core Infrastructure Construction

The United Nations (2015 Revision of World Population Prospects) and the Asian Development Bank (ADB) estimated the scale of some core infrastructure financing, such as \$11.69 trillion should be invested in energy sector from 2016 to 2030, \$7790 billion every year, accounting for 51.8% of gross assets. In addition, the other three items of traffic are estimated also (Figure 10, Figure 11).

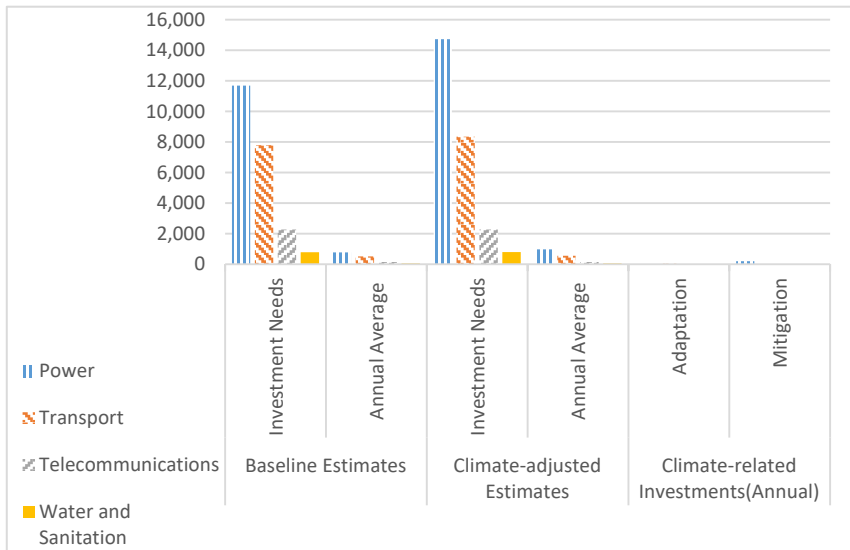


Figure 10 Infrastructure Investment Needs by Sector, 2016-2030(\$billion).

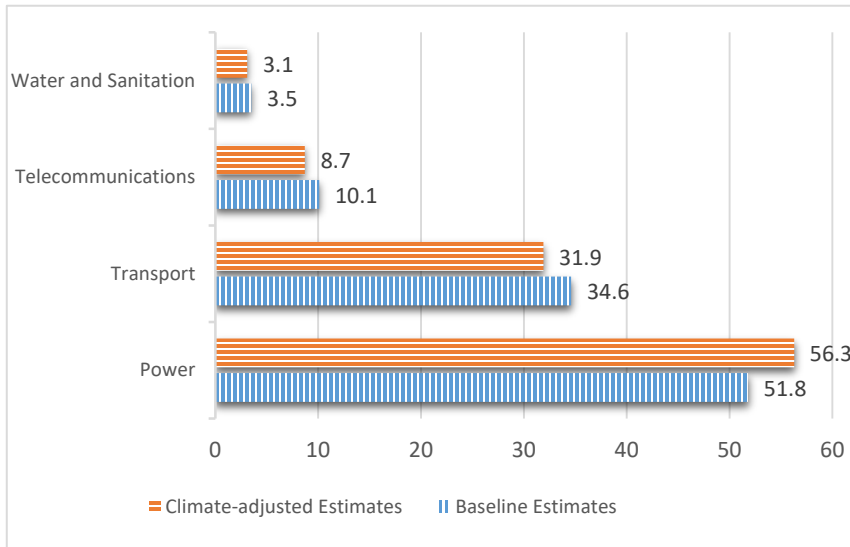


Figure 11 Some Infrastructure Investment Needs as % of Total.

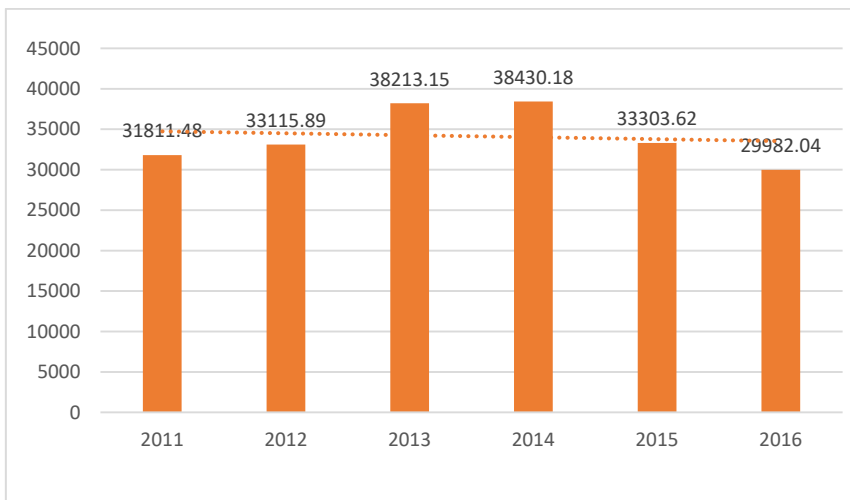


Figure 12 China's Foreign Exchange Reserves(\$hundred million).

5. Suggestions for the Belt and Road Infrastructure Constructions

5.1. Play the "Capital Supply Station" Role and Make Full Use of Foreign Exchange Reserves

There are many countries where the foreign exchange reserves is full along The Belt and Road. Such as China, although the amount of foreign exchange reserves has declined slightly in the past four years, the amount of foreign exchange in 2016 is still \$3.0 trillion (Figure 12). At the same time, some of the countries along the line are lacking in foreign exchange reserves and lack of funds for infrastructure, such as Bangladesh. The high reserve countries will avoid the risk of the exchange rate and the low reserve countries will meet the infrastructure needs ,if playing the role of "fund replenishment station" achieve the balance of all countries' foreign exchange and the goal of funds' accommodation[4].

5.2. Establish a Perfect Credit System to Eliminate the Credibility of the Deficit

Due to the differences in economy, culture, political stability and other conditions is different, the more than 60 countries along The Belt and Road have different credit condition. There are 4 countries ranking "A" and 6 countries ranking "B" in the solvency and sovereign credit rating of 10 Central and Eastern European countries. Therefore, establishing a perfect credit system, avoiding credit risk and eliminating credit deficit in international cooperation is significant.

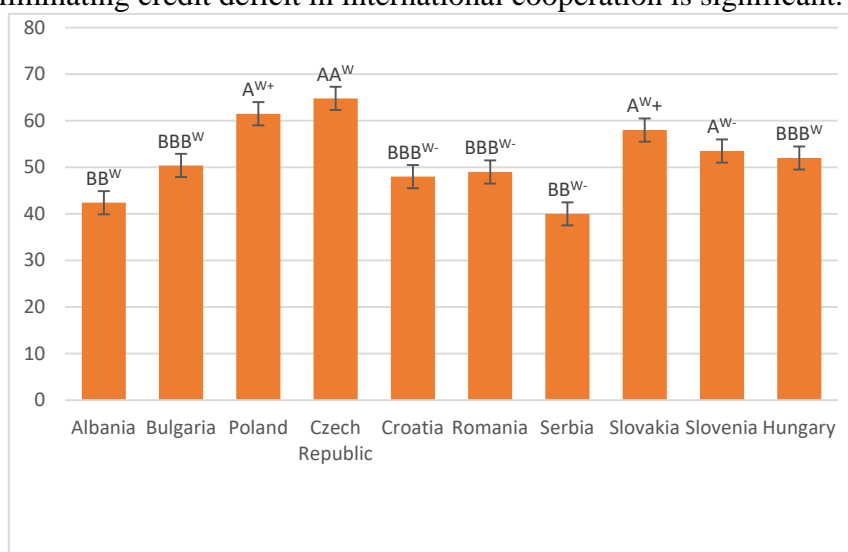


Figure 13 10 Central and Eastern European countries sovereign credit level in 2016

5.3. Public and Private Sectors Work Together to Adopt a Variety of Financing Modes

Table 2 and Figure 3 shows that the private sector plays a small role in infrastructure financing in China, the number of average financing accounted for about 10% Tfor total, while the public sector financing up to 90%, almost "a dominance". So mobilizing private sector's enthusiasm, making the public and private departments work together is a "short cut" to solve problems. Public and private sector cooperation methods mainly include four modes-PPP, BOT, TOT, and RCP (Table 4), the four modes have their own advantages and disadvantages [8], so four patterns should be combined, making best use of thier strengths and bypass thier weaknesses.

Table 4 Public-private sector cooperation models.

Types	The explanation of name	Features
PPP	public-private-partnership	Government and the private sector cooperation based on concession agreements
		Sharing interests, sharing risks,full cooperation
BOT	build-operate-transfer	Government give the private sector some concession
		The private sector finance, construct, manage and run infrastructure
		The private sector can charge the user
		Expired ownership free of charge to the government
TOT	transfer-operate-transfer	Government construct infrasture, and paid to the private sector
		When the contract expires, the private sector return ownership to government for free
		Suitable for business projects
RCP	resource-compensation-project	Government empower enterprises to build, operate and maintain infrastructure
		Enterprises can charge users
		When the contract expires, the private sector return ownership to government for free
		Government transfer resources to enterprises as a compensation

5.4. To Promote the Internationalization of the RMB and Eliminate Exchange Rate Risk

At present, capital dealings of the countries along The Belt and Road settle in dollars. So they may face the risk of exchange rate loss. Because of the large scale of infrastructure financing flowing, many infrastructure projects and frequent capital exchanges, the risk of exchange rate loss will cause huge losses [6]. Because RMB is the world's fifth largest payment currency, China is also the "leader" of the Asian Infrastructure Investment Bank and the largest shareholder, RMB has the conditions of wild using in regions (Figure 13). The risk of exchange rate loss can be reduced and the efficiency and adequacy of infrastructure financing can be improved, if we promote RMB in the regions of the Belt and Road and internationalise it. Besides, we can catch the opportunity of RMB internationalization to strengthen national unity and promote the overall development.

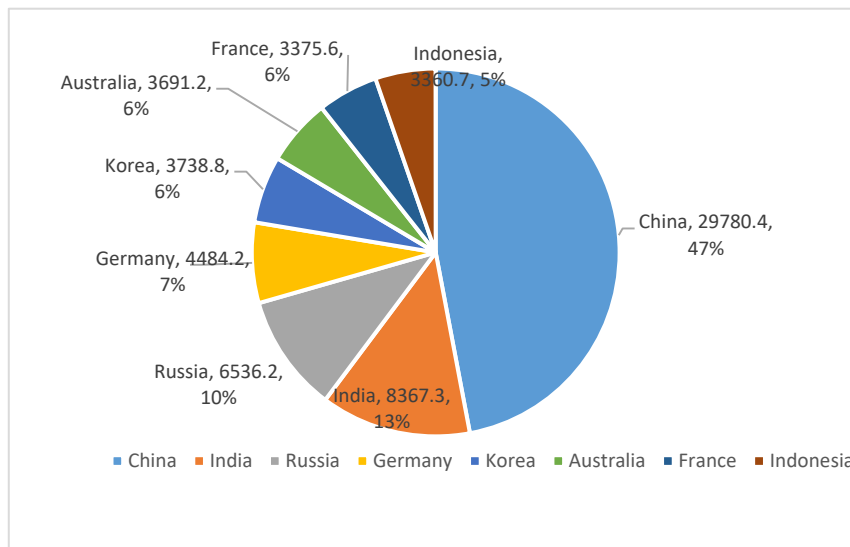


Figure 14 Investment Situation of ADB Shareholders (\$million).

6. Conclusions

Since the Belt and Road was put forward, 6 Silk Roads developed rapidly and related infrastructure construction made gratifying achievements. However, there are also problems, such as a huge financing gap, imbalanced investment and limited cooperation. To this end, we should play the "Capital Supply Station" role and make full use of foreign exchange reserves; establish a perfect credit system to eliminate the credibility of the deficit; public and private sector work together to adopt various financing models and internationalise RMB to eliminate exchange rate risk and so on.

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