SUB-REGIONAL STUDY
NORTH AND CENTRAL ASIA
Financing Infrastructure

David Lezhava

April 30, 2017

The study was developed under a United Nations Development Account project entitled "Financing strategies for inclusive, equitable and sustainable development in Asia and the Pacific", which is implemented by the Macroeconomic Policy and Financing for Development Division, ESCAP. The views expressed in this document are those of the author and do not necessarily reflect the views of the United Nations Secretariat. The report benefited from extensive comments from Mathieu Verougstraete, Economic Affairs Officer, Financing for Development Section, UNESCAP. This publication has been issued without formal editing.

Table of Contents

List of Figures

List of Tables

Acronyms and Abbreviations

ADB	Asian Development Bank
BRICS	Group of countries: Brazil, Russia, India, China and South Africa
CAREC	Central Asia Regional Economic Cooperation
DAI	Digital Adaption Index
EBRD	European Bank for Reconstruction and Development
EIB	European Investment BANK
FRD	Fund for Reconstruction and Development of Uzbekistan
GDP	Gross Domestic Product
ICT	Information and Communication Technologies
IFI	International Financial Institutions
IMF	International Monetary Fund
MGI	McKinsey Global Institute
NFRK	National Fund of the Republic of Kazakhstan
OECD	Organization for Economic Development and Cooperation
PF	Partnership Fund
PIM	Public Investment Management
PIMA	Public Investment Management Assessment
PPP	Public-Private Partnership
SDBT	State Development Bank of Turkmenistan
SDG	Sustainable Development Goals
SF	Stabilization Fund of Turkmenistan
SOEs	State Owned Enterprises
WB	World Bank
WGI	World Governance Indicators

Executive Summary

The need for larger investment in infrastructure is widely recognized. Although there are variations regarding existing estimates, existing reports show that current investment levels are not sufficient to meet infrastructure needs and that public capital stocks are increasing less rapidly than GDP. In that context, this study discusses the state of infrastructure development in North and Central Asia and suggests options for closing the infrastructure financing gap.

Overall, the study examines macroeconomic conditions, reviews sector development, and provides arguments for developing infrastructure in the region. It also sheds lights on the complexity of increasing investments at a time of moderating revenues and growing expenditures, which translated into greater fiscal deficits.

The study suggests two paths for closing infrastructure financing gaps, which are respectively to make investment more efficient and expand financing from various sources. Regarding the former, the IMF methodology is used to analyze public investment management. Based on this analysis, the study argues that large efficiency gains can be achieved by strengthening the public investment management institutions.

Different financing sources for infrastructure development are discussed, including the State budget and off-budget sources (such as specialized funds). In this respect, the study argues that all countries in the sub-region have room to further streamline both revenues and expenditures (although at different levels). The important role of donor financing is also discussed. For some countries, donor financing is likely to remain a major source for infrastructure development in the coming years. However, fiscal prudency calls for avoiding excessive borrowing (including from donors).

In addition, the study stresses that the private sector can play a greater role in financing infrastructure. For this to happen, the study discusses the government's role in creating an attractive environment for the private sector while ensuring prudent decision making process. The study also highlights the importance of access to financial markets.

Finally, the conclusion part summarizes the findings and provides recommendations for increasing the efficiency of infrastructure investments and mobilizing additional resources.

1. Introduction: Importance of infrastructure development

1.1. Importance of Infrastructure Development

Promoting infrastructure development is considered as one of the main responsibilities of the State. Infrastructure affects economic activities by facilitating trade, increasing productivity, and opening the door for innovative business activities. It is an important vehicle to promote social well-being as it facilitates the inclusion of citizens in economic activities, and contributes to provide access to health and education services.

With economic development, rising urbanization and population growth, the demand is increasing for infrastructure such as roads, water treatment facilities and power plants. Similarly the integration of global and regional markets calls for strengthening regional infrastructure networks, including railways, transmission lines and fiber cables.

Quality infrastructure is also central to achieving the 2030 Agenda for Sustainable Development. The Sustainable Development Goals, SDGs, fully recognize the contribution infrastructure can make to building stronger, more competitive economies, but also more inclusive and equitable societies. More investment in resilient infrastructure (SDG9) is a goal in itself. But achieving a great number of others depends on increasing infrastructure capital such as SDG 6 - clean water and sanitation and SDG 7 - affordable and clean energy.

Overall, infrastructure development is vital for enabling growth, eliminating poverty and reducing inequality. Regarding the latter, women face particularly inequalities due to poor infrastructure, especialy in rural and remote areas where they are often involved in unpaid work. Limited access to basic infrastructure in such areas requires more time and effort from them to perform their tasks (UNDP, 2016).

This paper will discuss options for the government to achieve infrastructure development and what needs to be done for the investment to yield to the best results for citizens and businesses. Infrastructure is not an end in itself. Rather, it is a means for ensuring the delivery of goods and services that promote prosperity and growth (OECD, 2007).

1.2. Infrastructure investment needs globally and in the region

The McKinsey Global Institute (MGI) estimated at USD 57 trillion the global infrastructure investment needs for the period of 2013-2030, which is 60 per cent above the volumes of investment during last 18 years (McKinsey & Company, 2013). According to ADB estimates, developing countries in Asia will have to invest USD 26 trillion from 2016 to 2030, or USD 1.7 trillion per year while the region currently invests an estimated USD 850 billion annually leaving a significant gap to bridge. The power sector is expected to require the lion's share of these investments (over 50 percent) followed by Transport (35 percent), Telecommunication (10 percent), and Water and Sanitation (3.5 percent). Investment requirements for the same period for Central Asia are projected at USD565

billion (equivalent to around 8% of GDP). This would necessitate increasing current investments by around 3.1 percent of GDP (ADB, 2017). Although these estimates might not be fully accurate, they hint to the need of finding the options for closing the infrastructure financing gap.

The need to invest more in infrastructure is widely recognized by governments in North and Central Asian countries as illustrated by the following examples:

- *Russian Federation*: The vast infrastructure needs in the country are cited in various strategies and programs dedicated to infrastructure development (WB, 2016). For example, a study from Ernst & Young refers to the database that includes 325 projects in infrastructure, with a time horizon of up to 2030 (Ernst & Young , 2014). The investment needs of these projects are estimated at about US$1 trillion, equivalent to 75 percent of Russia's 2015 GDP.
- *Kyrgyzstan*: The country's Poverty Reduction Strategy (PRS) notes that investment projects financing for 70 national projects during 2013-2017 required 354.8 billion soms (equivalent to USD7.5 billion), while financing capacity was estimated at 187.6 billion soms (equivalent to USD4.0 billion) (IMF, 2014). The 2015 IMF staff report also expressed concern regarding the infrastructure investment size, which is in excess of 20 percent of GDP. The report noted that if these investments are spent over the three year period as planned, it will push the public debt within a level of a high risk of debt distress (IMF, 2016).
- *Georgia* aims to invest in the next four years around GEL7 billion (20 percent of GDP) in infrastructure on top of its historical pace of investment, totaling to GEL17.5 billion (equivalent to USD7.3 billion).
- *Uzbekistan*: the authorities recently announced a public investment program, amounting to $41 billion during 2015–19 (11 percent of GDP annually) (Sommer, 2016).

Table 1: Investment Plans

	Investment Plan	Period	Yearly Investment (% GDP)	Source
Kyrgyzstan	USD 7.5 billion	2013-2017	>20	(IMF, 2014)
Georgia	USD 7.3 billion	2017-2020	11	MoF
Russian Federation (Large projects)	USD 1 trillion	Up to 2030	5	(Ernst & Young , 2014)
Uzbekistan	USD 41 billion	2015-2019	11	(Sommer, 2016)

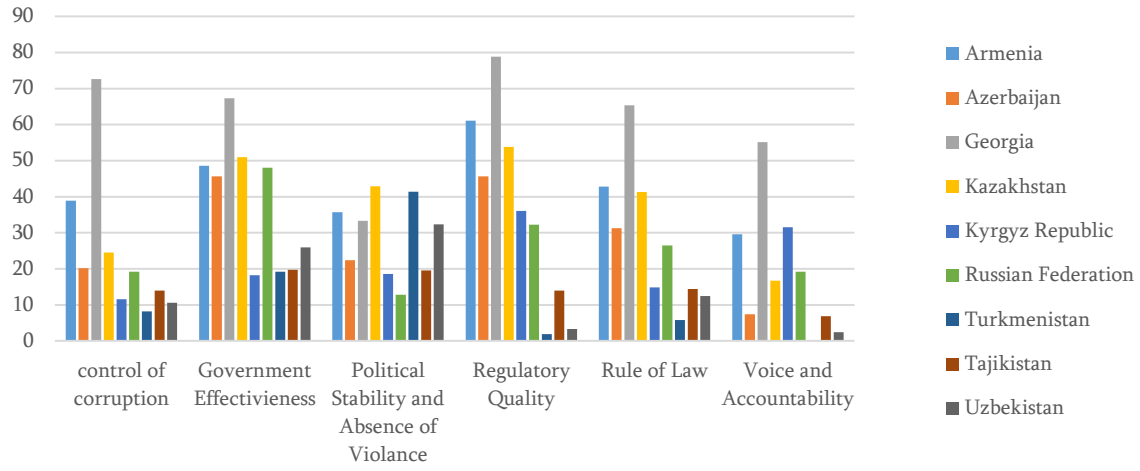
The pressure on public finance is expected to continue to increase due to the aging population and higher demand for social assistance. Stricter environmental standards are also likely to lead to higher investment costs. At the same time, the intention of governments to ease the tax burden on businesses makes it particularly challenging to increase investment while maintaining fiscal discipline. The conventional view is that traditional sources of public finance alone do not suffice to meet the growing future infrastructure requirements (OECD, 2007).

2. Country overview

2.1. General Overview

At first glance, it is obvious from the various indicators of the North and Central Asia countries that countries in the sub-region are diverse. Five of these countries are oil and gas exporters (Azerbaijan, Kazakhstan, Russia, Turkmenistan and Uzbekistan), while the four others are importers. Countries differ from each other by geography and density of population. All countries are landlocked except Georgia and Russia. In Kazakhstan, GDP per capita is almost ten times higher than in Tajikistan. Similarly unemployment figures contrast widely. World Governance Indicators also show important variations across countries, with Georgia leading in the region whereas several countries perform significantly lower.

Figure 1: World Governance Indicators (percentile ranking)



Source: WGI

Despite these variations, the recommendation to invest more in infrastructure is valid for all the North and Central Asian countries. Therefore these countries need to find additional sources of financing and ways to improve the efficiency of their infrastructure spending.

Infrastructure development is bound to have positive impact on a number of indicators, some of which are provided in table below. For instance, infrastructure supports reduction of poverty, especially in rural areas, creation of jobs, and acceleration of economic development. Improved governance should also open the door for greater participation of the private sector in infrastructure development.

Table 2: Country Characteristics

	Armenia	Azerbaijan	Georgia	Kazakhstan	Kyrgyzstan	Russian Federation	Tajikistan	Turkmenistan	Uzbekistan
GDP per capita, 2015 *(2011PPP $thousands)*	7.9	16.7	9.1	24.4	3.2	23.9	2.6	15.5	5.6
land *(thousand sq. km)**	30	87	70	2725	200	17,098	141	488	447
population, 2015 (millions)	3	9.8	4	17.6	5.9	143.5	8.5	5.4	29.9
population density *(people per sq km)**	106	117	64	6	31	9	61	11	74
Unemployment (2015)	16.3	4.7	12.3	5.6	8.2	5.8	10.9	10	10.1
HDI rank	84	78	70	56	120	49	129	111	105
Gini coefficient	31.5	31.8	40.1	26.3	26.8	41.6	30.8	N.A	N.A
Population living below income poverty line, PPP $1.90 a day (%)	2.3	0.5	9.8	0	1.3	0	19.5	0.1	n.a.
Population urban ()	62.7	54.6	53.6	53.2	35.7	74	26.8	50	36.4
Doing Business**	38	65	16	35	75	40	128	N.A	87
Global Competitiveness Index (rank)***	82	40	66	42	102	45	80	N.A	N.A
Corruption Perception Index (rank)****	113	123	44	131	136	131	151	154	156

*Sources: HDR, *-WDI, **-DBS, ***-GCI, ****-TI*

The Russian Federation, as the largest country in the world by land area and sixth largest country by GDP, has an unique geographic location, which includes: a) links between Europe with Asia; b) worldwide sea routes (direct access to three oceans with 53 sea ports); c) major airport hubs; d) Railway transit routes (longest in the world - 43,000km); e) well developed pipeline network connecting to Europe; f) common border with 17 countries. (Ernst & Young , 2014) This short description speaks for itself with regard to the great transit potential of the Russian Federation. However, other countries in the sub-region have the ambition of playing a transit role between Europe and Asia. This is particularly true in the case of Kazakhstan, Azerbaijan and Georgia. With

technical progress in multimodal transportation and subsequent cost reduction, these countries may attract more traffic, which could in turn contribute to the development of the sub-region.

Without downplaying the importance of transport infrastructure, it should be noted that often countries overvalue the importance of their geopolitical location, considering it as one of the unutilized potential for economic growth. While there are many competitive routes from China to Europe, one can argue that considering trade volume dynamics, traffic will be enough for everyone. However, without sufficient coordination or at least without a clear understanding of other countries' plans, the sub-region may end up with overinvesting in infrastructure.

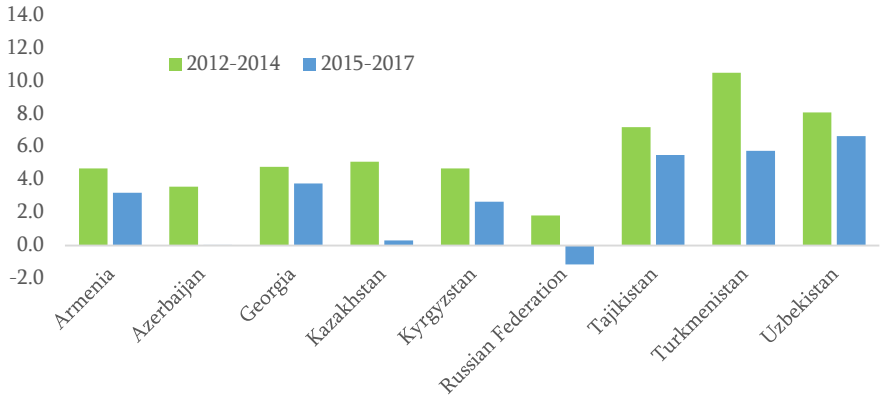
Map of the Region [1]

2.2. Macroeconomic overview

Since 2014, the North and Central Asian region has been hit by large and persistent external shocks, particularly a slump in commodity prices and the slowdown of its key economic partners (mainly Russian Federation and China) (IMF, 2016).

[1] The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Figure 2: Average Growth Rates



Source: WEO[2] and author's calculations

Russia is the largest economy in the region and its development affects all the neighboring countries through trade and financial (including remittances) channels.

Table 3: Linkages with Russian Federation

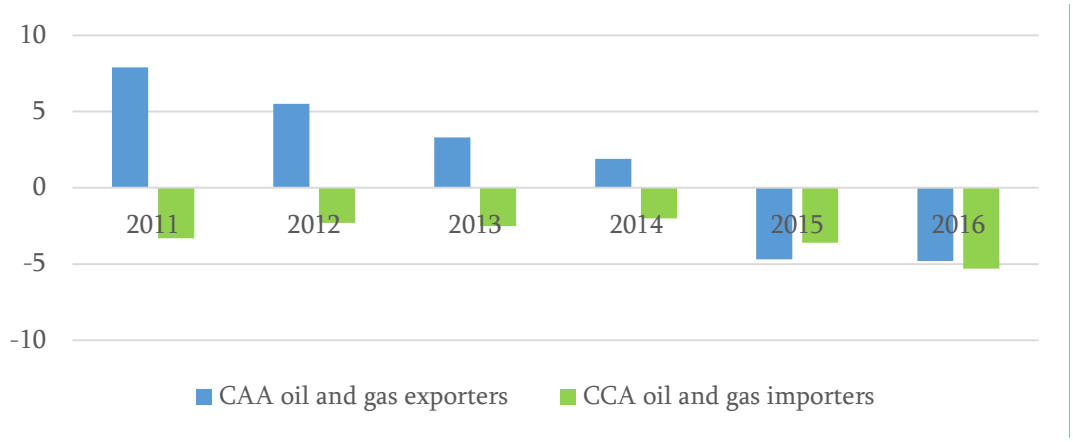
		< 3% of GDP	3-10% of GDP	> 10% of GDP	
		Export	**Import**	**Remittances**	**FDI**
Oil Exporters					
	Azerbaijan				
	Kazakhstan				
	Uzbekistan				
	Turkmenistan				
Oil Importers					
	Armenia				
	Georgia				
	Kyrgyz Republic				
	Tajikistan				

Source: IMF[3]

[2] *International Monetary Fund, World Economic Outlook Database, October 2016*
http://www.imf.org/external/pubs/ft/weo/2016/02/weodata/weoselgr.aspx
[3] https://www.imf.org/external/pubs/ft/dp/2016/mcd1602.pdf

Widening fiscal deficit is observed across the board. Interestingly, traditional surplus of oil and gas exporters are turning into deficits and catching up with negative values of oil and gas importers (Horton M., 2016).

Figure 3: Budget Deficit Dynamics in Caucasus and Central Asia (CCA)



Source: IMF, Regional Economic Outlook: Middle East and Central Asia (Oct 2014[4], Oct 2016[5])

These deficits affect the indebtedness levels in the region. However, oil exporter's public debt is still favorably low, only Azerbaijan approaching 40 percent of GDP level in 2016. Oil importers debt levels are comparatively higher ranging from 43 percent of GDP in Georgia to 72 percent of GDP in Kyrgyzstan. In order to balance debt sustainability with business-friendly fiscal policies, countries need to prioritize pro-growth capital expenditures.

In the region, Armenia, Georgia and Russian Federation are using a fiscal rule. For example, the Russian parliament adopted in 2012 an oil-price based fiscal rule, which sets ceiling on expenditures. Previously Russia also had a rule limiting non-oil budget deficit to 4.7 percent of GDP, but the rule was abolished after the financial crises.[6] In Georgia, the Organic Law of Georgia on Economic Freedom (Liberty Act) provides a fiscal rule, which limits budget deficit to 3 percent of GDP, public debt to 60 percent of GDP and expenditures and increase in non-financial assets - to 30 percent of GDP. In Armenia, the Law on Public Debt prevents general government debt from exceeding 60 percent of GDP, and once the debt ratio reaches 50 percent, a braking mechanism is triggered. This mechanism limits the fiscal deficit in the following year to 3 percent of the average GDP of the previous 3 years (IMF, 2016).

Although these fiscal rules are valuable, they do not regulate investment amounts and hence, do not provide predictability regarding investment levels in the medium term (more on this topic is discussed in the section: Public Investment Management Assessment). North and Central Asian

[4] http://www.imf.org/external/pubs/ft/reo/2014/mcd/eng/pdf/mreo1014.pdf
[5] http://www.imf.org/external/pubs/ft/reo/2016/mcd/eng/pdf/mreo1016.pdf
[6] *http://www.imf.org/external/datamapper/fiscalrules/map/map.htm*

countries with or without fiscal rules, have to be cautious with widening fiscal deficits, amidst upcoming budget pressures caused by moderating revenues and increasing expenditures. While making decisions on fiscal policy, it is important to be watchful of external imbalances, especially for the countries running double digits of Current Account (CA) deficits for a long time.

Table 4: Current Account Deficit as percent of GDP

Country	2010	2011	2012	2013	2014	2015	2016	2017
Armenia	-13.6	-10.4	-10.0	-7.3	-7.6	**-2.7**	**-2.5**	**-3.0**
Azerbaijan	28.0	26.5	20.2	16.4	13.9	**-0.4**	**0.7**	**3.1**
Georgia	-10.2	-12.8	-11.7	-5.8	-10.6	**-11.7**	**-12.1**	**-12.0**
Kazakhstan	0.9	5.1	0.5	0.4	2.6	**-2.4**	**-2.2**	**0.0**
Kyrgyzstan	-2.2	-2.9	3.7	-1.1	-17.8	**-10.4**	**-15.0**	**-14.9**
Russian Federation	4.1	4.8	3.3	1.5	**2.8**	**5.2**	**3.0**	**3.5**
Tajikistan	-1.1	-4.8	-2.5	-2.9	**-2.8**	**-6.0**	**-5.0**	**-5.0**
Turkmenistan	-10.6	2.0	0.0	**-7.2**	**-7.5**	**-10.3**	**-18.5**	**-18.0**
Uzbekistan	6.2	5.8	1.8	2.9	**0.7**	**0.1**	**0.1**	**0.2**

Source: WEO[7]

3. Infrastructure Development

Overall, the sub-region ranks relatively low in terms of infrastructure development as illustrated by the Global Competitiveness Index (GCI). However, the perception of infrastructure quality is improving (see Figure below) as well as the average rank of these countries, which has improved in recent years from 87th to 75th. For example, GCI ranks Russia's infrastructure is quite high (35th out of 140). The aggregate ranking may though be misleading as significant differences exist in the quality of the different types of infrastructure. Russia scores well on air transport capacity (12) and mobile connectivity (18), while the quality of its roads is among the worst in the world (123) (WB, 2016).

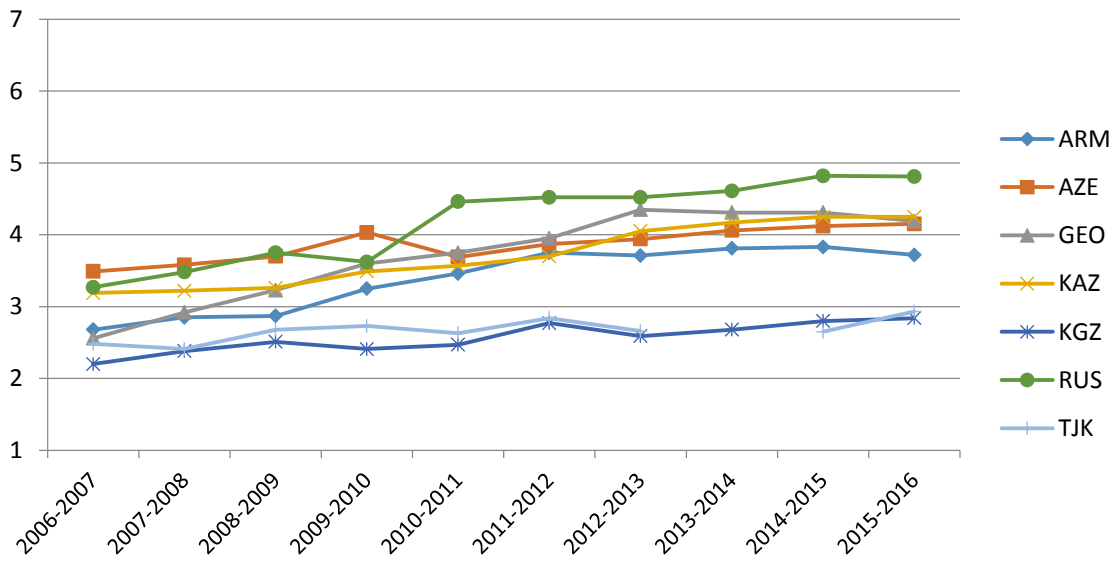
[7] http://www.imf.org/external/pubs/ft/weo/2016/02/index.htm

Table 5: Global Competitiveness Index: ranking – Infrastructure development

Edition	ARM	AZE	GEO	KAZ	KGZ	RUS	TJK	Average
2015-2016	82	65	61	58	114	35	111	75
2014-2015	78	70	59	62	115	39	120	78
2013-2014	80	69	56	62	122	45		72
2012-2013	80	71	53	67	121	47	118	80
2011-2012	77	73	68	82	114	48	111	82
2010-2011	90	76	73	81	124	47	116	87
2009-2010	81	58	72	75	124	71	109	84
2008-2009	90	61	77	76	111	59	101	82
2007-2008	87	60	83	71	110	65	109	84
2006-2007	87	60	91	67	107	66	93	82

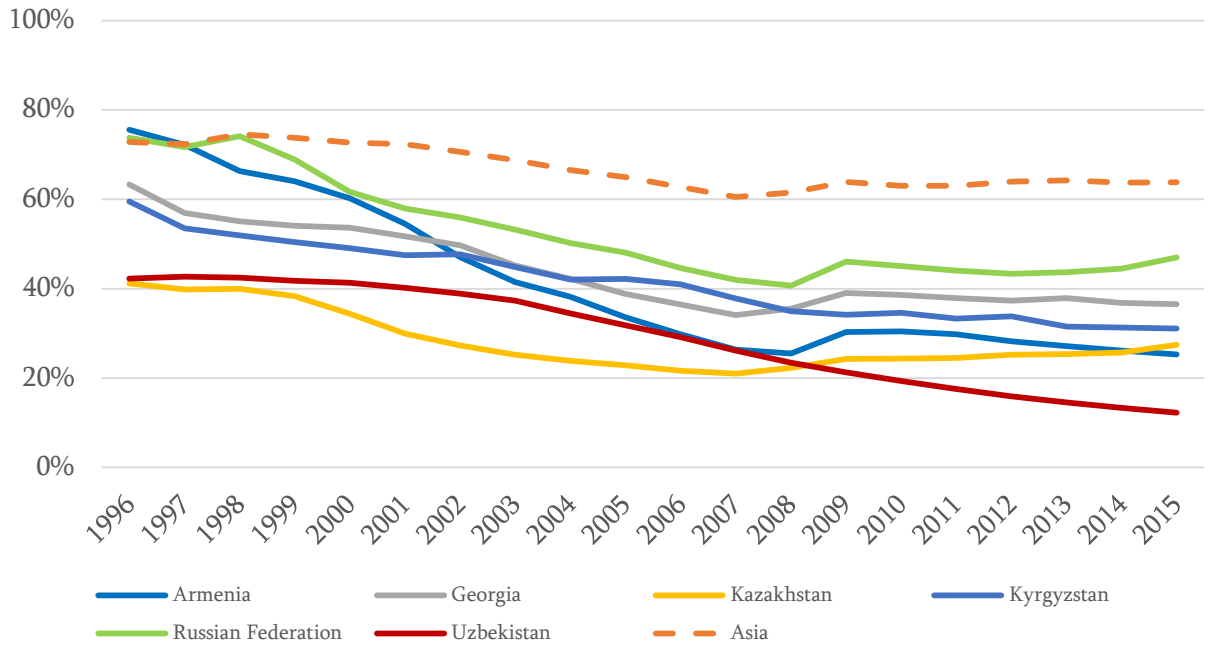
Source: WEF

Figure 4. Global Competitiveness Index: Score - Infrastructure development [1 = worst; 7 = best]



The real value of the accumulated public capital stock on a per capita basis has increased across countries, but the pace is slower than the growth of economic output (IMF, 2016). This has resulted in a gradual deterioration of Public capital stock to GDP (2011 PPP$ adjusted) ratio, which is a global tendency but particularly acute for most of the North and Central Asian countries.

Figure 5: Public Capital Stock (2011 PPP$-adjusted, percent of GDP)



Source: IMF Investment and Capital Stock Dataset, 2017 and author's calculations

3.1. Transport

Transport sector plays a major role in economic and social development of North and Central Asian countries. The transport sector is important not only for internal connectivity but also for transit, as most of these countries are on the routes that connect Europe to Asia. For example, transit traffic is forecasted to generate $1.1 billion in annual revenues for Kazakhstan (ADB, 2011) and the transport of transit containers from China to Europe through Kazakhstan tripled during 2014-2015 (MID, 2017). The country's transit potential should continue to increase with the development of new international corridors from the west of the country into the direction of the Persian Gulf, through Turkmenistan and the Islamic Republic of Iran whereas

However, underdeveloped infrastructure in the region is an obstacle to fully utilize the potential of international corridors. Technical and operational characteristics of roads are poor and the average driving speed along the Europe–Caucasus–Asia transport corridor is less than 20 km per hour (ADB, 2011). In the same vein, according to the international Logistics Performance Index, the performance of North and Central Asian Countries is poor, with only Kazakhstan being ranked among top 100 at 77th (out of 160 countries). The Global Competitiveness Index also shows that quality of transport infrastructure requires more attention especially in roads sector.

Table 6: Quality of Transport Infrastructure (GCI 2015-2016)

	ARM	AZE	GEO	KAZ	KGZ	RUS	TJK
Quality of roads	75	70	73	107	131	123	82
Quality of railroad infrastructure	71	39	35	27	77	24	46
Quality of port infrastructure	132	59	73	114	138	75	133
Quality of air transport infrastructure	86	41	90	85	126	77	78

Source: WEF[8]

Countries need to invest more to develop their infrastructure networks, but more importantly, financing for rehabilitation and maintenance needs to be increased. Sixty percent of roads are aging and require rehabilitation in Armenia (ADB, 2013), Azerbaijan (ADB, 2013) and Uzbekistan (ADB, 2011). The situation is even more challenging in Tajikistan. Most of the road network was constructed before the 1970s and 80 percent of the roads are in poor or very poor condition because of inadequate maintenance (ADB, 2015).

Aiming to play an important transit role, Georgia plans to invest USD3 billion in its road infrastructure during the next 4 years and considers a PPP arrangement for building a deep-sea port in Poti. At the same time, Azerbaijan's strategy document for 2020 targets to establish Azerbaijan as a regional trade hub that will give country new economic opportunities (ADB, 2013).

Railway systems are playing important role in North and Central Asian countries' economic life although the quality of infrastructure is often cited as a common problem in the region. In addition, rail systems are not compatible with the railway network of other neighboring countries such as China. Effective transshipment facilities would facilitate the competitiveness of the railway systems amidst growing international traffic of goods (ADB, 2012).

Institutional problems are also a barrier for the sector development. ADB considers that in Georgia transport charges are not optimal leading to the inadequate division of freight between roads and rail, latest carrying less freight than it should (ADB, 2013). Similarly, a World Bank document mentions that the Russian road network faces a number of public investment management challenges, including procurement methods that lead to inefficiency and the lack of technical and economic justification during selection of projects (WB, 2016). For Russia, improving the quality of railway infrastructure is equally important than roads as rail often is the only transportation option for large Russian industries (WB, 2016).

In Kazakhstan, the government also attaches great importance to rail and invests heavily in the sector

[8] https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1

(i.e. 722 billion tenge (USD2.3 billion) was spent during 2010-2015 for the upgrade of railway infrastructure). The railway will also continue to play important role in Uzbekistan's economic development. The government intends to restructure it into a commercial and efficient entity (ADB, 2011). In Azerbaijan, the government considers development of the railway sector as important as roads, and has developed a comprehensive program for the development of the Azerbaijan state railway. The total cost of the 5-year program is estimated at USD2 billion (ADB, 2013).

3.2. Energy

Development of the energy sector is vital for economic growth and improved leaving standards. Recent Regional Human Development Report finds that poor households are less likely to have access to improved energy sources (UNDP, 2016). The region is rich in different types of energy sources and access to electricity has improved, but more investment is required to meet the future demand.

For instance, the region is rich in hydrocarbon, hydro and renewable energy resources. Among North and Central Asian countries, five of them (i.e. Azerbaijan, Kazakhstan, Russia, Turkmenistan and Uzbekistan) are oil and gas exporting countries. Kazakhstan also has large coal deposits. Tajikistan, Kyrgyzstan and Georgia have ample hydro resources, of which only 6, 12 and 18 percent respectively are utilized for power generation (OECD/IEA, 2015).

Table 7: Electricity Production, Sources and Access (WDI)

	Electricity production (kWh billions)	Sources of electricity production (of Total)						Access to electricity
		Coal	Natural gas	Oil	Hydro-power	Renewable sources	Nuclear power	(% of population)
Armenia	7.7	0	41.2	0	28.2	0.1	30.6	100
Azerbaijan	23.4	0	93	0.1	6.4	0.3	0	100
Georgia	10.1	0	17.8	0	82.2	0	0	100
Kazakhstan	95.4	81.3	10	0.6	8.1	0	0	100
Kyrgyzstan	14	5.6	0.2	0.7	93.5	0	0	100
Russian Federation	1,057.60	15.2	50.1	0.8	17.1	0	16.3	100
Tajikistan	17.1	0	0.3	0	99.7	0	0	100
Turkmenistan	18.9	0	100	0	0	0	0	100
Uzbekistan	54.2	4.1	74.1	0.5	21.3	0	0	100
World	23,354.40	41.1	21.7	3.6	16.1	5.4	10.6	84.6

Source: WB, World Development Indicators[9]

[9] http://wdi.worldbank.org/table/3.7

World Development Indicators (sustainable energy for all) show that North and Central Asian countries provide universal access to electricity. However, the infrastructure stock is aging and needs rehabilitation/ replacement while power generation capacity has to further increase in order to meet the growing demand.

Almost a third of ***Armenia***'s generation comes from nuclear power plants, which are supposed to stop operation in 2026. While the government approved in 2009 a joint venture with Russia to build a new reactor (with capacity of 1,060 MW) at Metsamor, the government still needs to secure funding for the project (ADB, 2013).

In ***Georgia*** the average age of existing hydropower plants is 37 years and the oldest plants have been operating for 75 years (ADB, 2013). As the government wants to achieve energy self-sustainability all around the year, it plans to increase of generation capacity by 2.3 times - from 11.37 billion KWh in 2016 to 26.3 billion KWh in 2027 (GSE, 2017).

In ***Kazakhstan***, with almost half of the power generation infrastructure older than 30 years, upgrade and modernization are also required (ADB, 2011). A similar situation prevails in ***Uzbekistan*** with assets reaching 40 to 50 years old (ADB, 2011). The Uzbekistan's economy heavily depends on the energy sector. It is the second largest consumer of energy in the region. Interestingly, Uzbekistan doesn't have dedicated energy ministry and Cabinet of Ministers makes decisions on energy policies (OECD/IEA, 2015). The government has a USD19.4 billion investment plan for development of the oil and gas sector (ADB, 2011).

In ***Kyrgyzstan***, generation and transmission investment needs for 2012–2022 were estimated at USD1.9 billion for domestic needs, with additional USD5.4 billion to fulfill government's plans for export projects (ADB, 2012). According to the power sector regional master plan prepared by Central Asia Regional Economic Cooperation Program of ADB, nearly 80 percent of generation and transmission assets in ***Tajikistan*** need to be replaced. The investment needs for the next 10 years are estimated at USD4 billion (ADB, 2015).

As it is summarized by International Energy Agency, attracting investment will require an attractive business climate, a competitive and fair regulatory framework, market-price incentives and rule of law and transparency in place. For attracting the investment, it also considers importance of implementation of the Energy Community Treaty provisions (OECD/IEA, 2015).

Electricity market structures in North and Central Asian countries are different from country to country ranging from fully unbundled to integrated models. In some countries, the dominance of state-owned enterprises is obvious, while others rely mostly on power generation by the private sector. There is no competition at all in some countries, while in Kazakhstan there is a wholesale market representing 12 percent of sales, conducted in real-time (88 percent of transactions are through pre-agreed bilateral contracts) (OECD/IEA, 2015).

Electricity prices often are below the cost and there are cases of cross-subsidies. For example, the gas used in power generation receives subsidies from the government of Azerbaijan for circa USD650 million per year (ADB, 2013). Tariffs below cost put the sector in poor financial conditions. At the same time, tariff increases are politically sensitive and difficult to implement. In 2010, in Kyrgyzstan tariffs were doubled to Som1.5 per kilowatt-hour (kW/h). Following social unrest in 2010 partly attributable to this increase, tariffs were reduced back to Som 0.7 per kWh for households and Som1.327 per kWh for other customers (ADB, 2012).

Table 8. Tariffs for Residents and Non-residents

Country	Tariffs for Residential (US cent/kWh)	Tariffs for Non-residential (US cent/kWh)
Armenia	8.57	7.47
Azerbaijan	5.72	5.72
Georgia	5.67	4.98
Kazakhstan	5	5
Kyrgyzstan	1.48	4.01
Russian Federation	4.9	7.78
Tajikistan	2.32	5.61
Turkmenistan	0.323	0.323
Uzbekistan	5	5
OECD Average	17.4	12.4

Low Tariff  High Tariff

Source: IEA[10] and Energy Regulators Regional Association[11]

In the sub-region, there is a good cooperation to create energy export infrastructure. Kazakh and Azeri oil and gas exports to the world were made possible through Baku-Supsa, Baku-Ceyhan and South Caucasus pipelines with commendable regional cooperation spirit (OECD/IEA, 2015).

Oil accounts for about a quarter of Kazakhstan's gross domestic product and about 60 percent of its total exports (ADB, 2011). The Russian energy sector is the major contributor to the revenues of the federal budget. Energy sector generates a third of Russia's GDP and more than half of Russia's export comes from it. State-controlled corporations dominate the power, and oil and gas sectors where the level of competition is low (WB, 2016).

[10] https://www.iea.org/publications/freepublications/publication/energy-policies-beyond-iea-countries---eastern-europe-caucasus-and-central-asia-2015.html

[11] https://tdb.erranet.org/index.php?name=TariffDB&file=index&todo=pages&sub=electricity&id=4

3.3. Water

Development of water infrastructure is essential for economic development but more importantly for improving leaving standards. The MDG target - to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation – was achieved for drinking water by Russia, South Caucasus Countries and Kyrgyzstan in 2010 (UNICEF & WHO, 2015). However, none of these countries achieved the MDG target related to sanitation. Poor water supply affects women the most as in some countries women carry the burden of securing the family water supply (ADB, 2013). Improved infrastructure would not only enhance living conditions but allow more time for productive activities (ADB, 2011).

Regional- and country-wide average numbers may mask the full picture. While 61 percent of the population has access to piped water in ***Kazakhstan***, the situation is different for rural areas, where only 15 percent of access. Also, the situation is usually worse in other cities than the capitals. In ***Armenia***, the drainage systems are inadequate, there is no wastewater treatment and 46 percent of urban residents (outside Yerevan) do not have access to uninterrupted water supply (ADB, 2013).

Overall, most of the infrastructure in the region is old and needs effective maintenance and replacement. For example, water supply and sanitation infrastructure assets are 40-50 years old in ***Kyrgyzstan*** and maintenance costs over 20 years are estimated to USD700 million (ADB, 2012). Likewise in ***Kazakhstan***, 75 percent of water assets need replacement and the investment requirement for 28 cities is projected at USD2.8 billion for water supply improvements and USD1.3 billion for sewage treatment (ADB, 2011). To address these issues, ***Uzbekistan*** has developed the National Water Supply and Wastewater System Development and Modernization Plan, which targets by 2020 close to 100 percent and 85 percent of water supply coverage for urban and rural areas respectively. The Presidential Decree defines 38 major water supply and sanitation projects with an investment requirement of over USD300 million per year (ADB, 2011).

Also, the financial condition of companies in the sector needs improvement across the region. Sound economic incentives are essential to ensure the sustainable development of the sector while allowing greater participation of the private sector. In this respect, projects financed by donors often involve an institutional strengthening component. For example, in Kyrgyzstan, projects in the water sector with EBRD participation are coupled with water tariff reforms, implementation of IFRS accounting standards, and measures promoting efficiency in the water companies (IMF, 2016).

3.4. ICT

Over the last decades, ICT development has changed the way we live through easier and faster access to enormous volume of information, digital finance, on-line trading, and so on. ICT can promote inclusion, efficiency and innovation (WB, 2016). Again, countries in the region differ in terms of ICT development as illustrated by the Digital Adaption Index (DAI) in the table below. According to this

index, Armenia and Russia are ahead of other countries in the sub-region. DAI is constructed along three indicators: businesses, people, and government.

Table 9: Digital Adaption Index

	Armenia	Azerbaijan	Georgia	Kazakhstan	Kirgizstan	Russian Federation	Tajikistan	Turkmenistan	Uzbekistan
Digital Adaption Index	**0.67**	**0.54**	**0.58**	**0.63**	**0.49**	**0.71**	**0.4**	**0.4**	**0.45**
Business indicator	*0.48*	*0.27*	*0.59*	*0.32*	*0.37*	*0.48*	*0.35*	*0.26*	*0.22*
3G coverage (%)	98	72	88	70	77	95	90	41	70
Download speed (kbps)	11091	5297	14393	14725	10341	22789	12923	-	2660
Secure servers (millions)	41	14	37	14	9	84	1	0	2
People indicator	*0.82*	*0.7*	*0.68*	*0.73*	*0.6*	*0.85*	*0.52*	*0.87*	*0.64*
Internet access at home (%)	66	40	46	54	25	73	13	71	28
Mobile access at home (%)	97	98	92	93	95	96	92	100	98
Government indicator	*0.72*	*0.64*	*0.66*	*0.83*	*0.5*	*0.8*	*0.32*	*0.07*	*0.49*
On-line public services	0.61	0.43	0.6	0.75	0.28	0.71	0.06	0.09	0.45
Digital identification	0.83	0.83	0.58	1	0.58	0.83	0.23	0	0.4
Core administrative system	0.7	0.67	0.8	0.73	0.63	0.87	0.67	0.13	0.63

Source: WB[12]

Russia's ICT industry is probably the most advanced in the region and Russian ICT companies are competitive on the global market. Market for broadband services is well-developed and Russia has one of the lowest tariffs adjusted for power-purchasing parity. Russia has moved up in the Global Networked Readiness Index (GNRI) from 80 (of 133 countries) in 2010 to 41 (of 144 countries) in 2015. However, challenges still remain. One of the major constraints for the sector development is access to finance. The venture capital market which plays important role in ICT development was quite dynamic, but not anymore as investment funds are on hold (WB, 2016). In the Russian Federation, the strong competition among mobile operators helped to develop its 4G LTE networks and it is expected that €10 billion will be invested by 2019 (Ruddy M., et al., 2014).

Speedy progress in the ICT industry required continuous investment in infrastructure, which has so far been led by the private sector. Private companies will continue to invest further as business opportunities arise. However, the public authorities should ensure that services remain affordable and accessible in remote and rural areas (ADB, 2016).

[12] http://wbgfiles.worldbank.org/documents/dec/digital-adoption-index.html

4. Public Investment Management Assessment[13]

Public investment in infrastructure accelerates growth from both demand and supply sides. While demand effects are temporary, the supply ones are permanent and several studies try to estimate the related fiscal multiplier effect. IMF estimates that public investment increases output in the same year by coefficient of 0.4 in developed countries, while effect after four years is 1.5 times the value of investment. In developing countries, these coefficients are 0.2 and 0.5 respectively (IMF, 2014). Lower effect in developing countries is somewhat counterintuitive as developing countries have greater scarcity of infrastructure and hence marginal effect of investment should be higher (i.e. each invested dollar should be expected to have greater value in developing countries). However, above mentioned difference may highlight the importance of efficiency in infrastructure investment.

IMF paper finds that countries with the same capital stock (calculated as accumulated investment) may have different quantity and different quality of infrastructure. These differences are caused by efficiencies in investment. It is found that efficiency is highly correlated with the strength of the public investment management (PIM) institutions.

Countries can get greater benefits from their investment by improving efficiency of their investments. Average country's efficiency is 27 percent away from the country that has highest efficiency. This gap means that almost ¼ of investment spending is wasted in an average country. If country moves from the lowest efficiency quartile to the highest efficiency quartile, the investment impact will double.

In order to evaluate the public investment practices, IMF has developed the Public Investment Management Assessment (PIMA) tool. PIMA looks at institutions at three different stages: planning, allocating investment and implementing. At each stage five institutions are watched.

Table 10: Public Investment Management Assessment (PIMA) of institutions

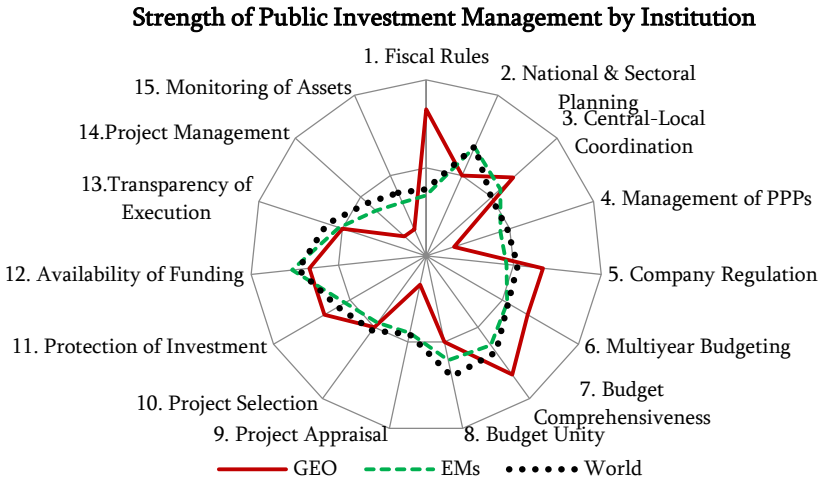
Stage 1: Planning.	Stage 2: Allocation	Stage 3: Implementation
Fiscal rules that govern investment levels	Multi-year budgeting that provides reliable predictability of investment plans	Ensure that entire investment amount is secured for the project and cannot be diverted
National and sectoral plans that ensure prioritization of investment	Budget comprehensiveness that captures all future plans	Availability of funding is based on objective forecast
Central-local coordination that allows having integrated plans	Budget unity that ensures that maintenance costs are considered when decision is made	Transparency of the budget execution and project implementation
Effective framework and practice of PPP management	Project appraisal follows standard methodology	Project management follows standardized process
Regulation of companies that ensures right business incentives	Project selection based on transparent criteria	Monitoring of public assets including recognition of depreciation

Source: IMF

[13] *Discussion in this section largely relies on IMF policy paper* (IMF, 2015) *http://www.imf.org/external/np/pp/eng/2015/061115.pdf*

PIMA tool allows the identification of institutional weaknesses in individual countries. Rough exercise produced for Georgia suggests strengthening the management of PPPs, including project appraisal process, project management and monitoring of assets.

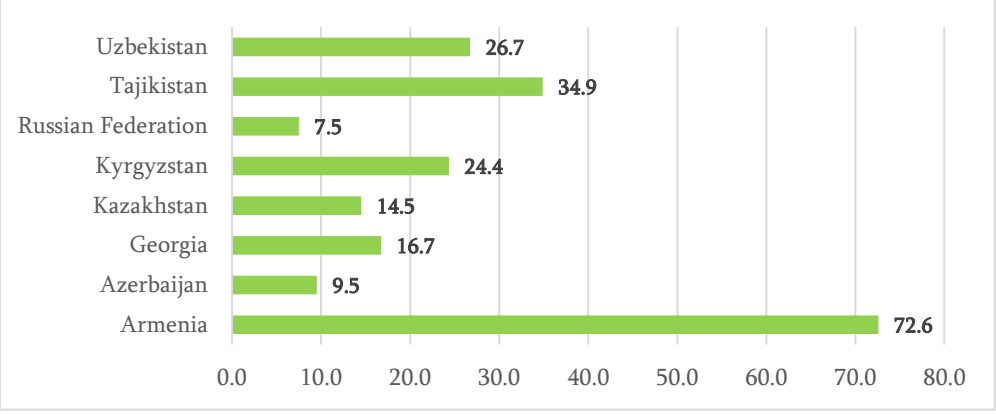
Figure 6: Evaluation of Public Investment Management in Georgia



Source: IMF and author's estimates

To lead to the desired results, infrastructure expenditures should be made in accordance with a strong public investment management (PIM) system. In this respect, one can assume that countries with high efficiencies have lower volatility of investment volumes as stop and go policies are expected to undermine the efficiency of infrastructure spending. Therefore high volatility in investment volumes might be considered as hint for the need to strengthen PIM institutions.

Figure 7: Volatility of Investment

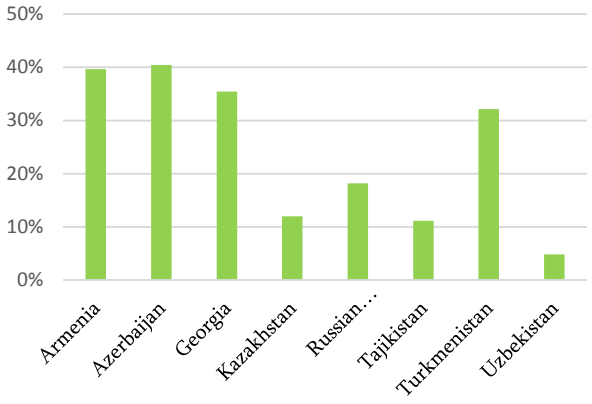


Source: IMF[14]

[14] http://www.imf.org/external/np/fad/publicinvestment/pdf/csupdate_jan17.pdf

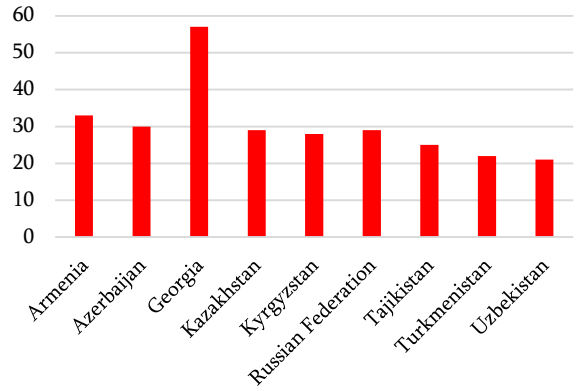
Countries with more credible capital budgets should have higher efficiency of capital spending. Here are two components important to consider: first, the difference between actual and planned investments; and second, the risk that project selection and procurement is driven by rent seeking. Transparency in public finance management and corruption levels can be considered as proxies for the latest component.

Figure 8: Difference Between Forecast and Actual Investment15



Source: IMF

Figure 9: Perceived Corruption (Higher score corresponds to lower perceived corruption)



Source: Transparency International[16]

It can also be noted that strong PIM institutions are associated with lower level of public investments. This may be explained by several reasons: 1. More developed countries have stronger PIM systems and lower needs for additional infrastructure; 2. More efficient system requires fewer investment to achieve the same goal; 3. strong PIM systems may directly create or at least can be associated with better environment for private investment that replaces the public investment; 4. Strong PIM systems set higher standards for selection and implementation of projects.

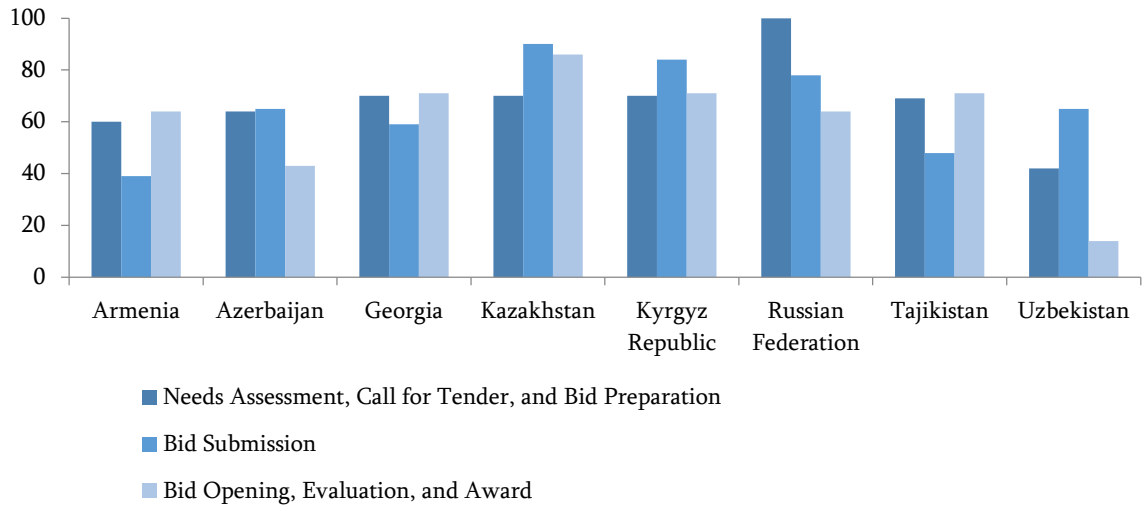
Certainty and predictability of investment levels over the medium term can also be strengthened by the introduction of fiscal rules such as the ones already in place in Armenia, Georgia and Russian Federation. However, fiscal rules in the region do not govern directly investment volumes nor allow investment predictability. Globally, there is a wide range of fiscal rules with some explicitly controlling public investment. Examples of such rules may include structural balance rule, golden rule, investment floors or others. Structural balance rule aims at reducing the pro-cyclicality of public expenditure. Economic downturns widen fiscal deficit and to keep this deficit under control the easiest response would be to cut capital expenditures. This would be a pro-cyclical type of response. Alternatively, structural balance rules allow countries to be less pro-cyclical. However, these rules are not easy to introduce for technical and transparency reasons. Golden rules allow borrowing only for

[15] Average of percentage difference between forecast of gross public fixed capital formation forecasted and actual (World Economic Outlook data)
[16] http://www.transparency.org/news/feature/corruption_perceptions_index_2016

capital expenditures and not for the current ones. Investment floors guarantee that capital expenditures do not fall below a certain level. Another type of fiscal rules excludes capital expenditures from the expenditure ceiling.

Efficiency gains can also be achieved by increasing the transparency at the selection and procurement stage. According to the survey conducted by Ernst & Young, 72 percent of respondents in Russia consider transparency in project selection to be a problem for infrastructure development. No other problem was quoted by respondents so frequently. 57 percent of respondents quote the quality of project preparation to be a problem for infrastructure development. An option to achieve this result could be to further involve the private sector and the use of bank oversight (Ernst & Young , 2014). Using modern technologies in procurement can also lead to significant savings. For instance in Georgia, from 2010 when the e-procurement platform reform was launched to 2011, the number of tenders rose from 1,923 to 33,000. The savings generated reached $400 million by 2015. This economy is now one of the few economies in the world where paper-based tenders have been fully eliminated (WB, 2017). Overall, improving public procurement process should result in better infrastructure outcomes. The 2017 World Bank's benchmarking study highlights that there is still room for improvements in this area.

Figure 10: Benchmarking of Public Procurement in the region



Source: World Bank (http://bpp.worldbank.org/data/exploreindicators/procurement-life-cycle)

Remark: *Needs assessment, call for tender, and bid preparation* considers whether there are consultations with the private sector and internal market analysis; open tendering as the default method of procurement; and available and accessible materials and information for the suppliers to be able to bid. *Bid submission* considers elements such as the registration of suppliers; foreign firms' eligibility; procedure for bid submission and requirements for bid security. *Bid opening, evaluation, and award* considers the procedure for bidding; criteria for evaluation; notification of unsuccessful bidders and the existence of standardized documents

5. Sources of Financing

5.1. State Budget

Widening fiscal deficits are observed across the region. Interestingly, traditional surpluses in oil and gas exporters are turning into deficits and are catching up with the negative values of oil and gas importers.

Table 11: General Government Fiscal Balance (percent of GDP)

	Average				Projections	
	2000–12	2013	2014	2015	2016	2017
Average for the region (except Russia)	**2,7**	**2,7**	**1,5**	**-4,6**	**-4,9**	**-3,0**
Oil and gas exporters	**3,4**	**3,3**	**1,9**	**-4,7**	**-4,8**	**-2,8**
Azerbaijan	4,7	1,0	3,2	-6,8	-9,9	-3,9
Kazakhstan	2,9	4,7	1,7	-6,9	-5,7	-4,2
Turkmenistan[7]	3,4	1,2	0,8	-0,7	-0,8	-0,4
Uzbekistan	3,2	2,9	1,9	0,7	-0,5	-0,3
Oil and gas importers	**-3,2**	**-2,5**	**-2,0**	**-3,6**	**-5,3**	**-4,4**
Armenia	-3,3	-1,6	-1,9	-4,8	-4,5	-3,0
Georgia	-3,3	-2,6	-2,9	-3,8	-4,7	-6,0
Kyrgyzstan	-3,2	-5,1	-2,8	-3,2	-8,8	-5,5
Tajikistan	-2,8	-0,8	0,0	-2,3	-4,0	-2,7

Source: IMF; Regional Economic Outlook; Middle East and Central Asia (October, 2016)

Table 12: Oil Exporters: General Government Non-Oil Fiscal Balance (Percent of non-oil GDP)

	Average				Projections	
	2000–12	2013	2014	2015	2016	2017
Average of three countries	**-12,9**	**-18,3**	**-18,2**	**-19,4**	**-19,0**	**-16,8**
Azerbaijan	-24,9	-46,8	-36,0	-34,9	-38,7	-33,5
Kazakhstan	-8,8	-8,8	-12,9	-15,9	-14,3	-13,0
Turkmenistan	-8,2	-11,7	-11,2	-8,2	-6,8	-6,4

Source: IMF; Regional Economic Outlook; Middle East and Central Asia (October, 2016)

The growing fiscal deficits naturally affect public debt levels. The latter are further inflated as a result of local currency depreciation (a large part of the public debt in the region is denominated in foreign currency). For example, the Kyrgyzstan Article IV IMF consultations report states that the country's external debt vulnerability is approaching the threshold of a high risk of distress, strengthening the case for domestic revenue mobilization and prioritization of investments (IMF, 2016). While making

decisions on their borrowing capacity, countries forecast their indebtedness level under different scenarios. The narrowing of fiscal space is quite obvious for most countries.

Table 13: General Government Gross Debt

Country	2010	2011	2012	2013	2014	2015	2016	2017
Armenia	33.7	35.7	36.5	38.0	41.4	46.9	**50.6**	**51.6**
Azerbaijan	12.5	11.4	13.9	12.8	11.2	28.3	**39.6**	**36.1**
Georgia	42.4	36.5	34.9	34.7	35.5	41.5	**42.1**	**43.5**
Kazakhstan	10.7	9.8	11.7	12.2	14.1	21.9	**21.4**	**21.3**
Kyrgyzstan	59.7	49.4	49.0	46.1	52.3	66.0	**72.1**	**72.2**
Russian Federation	10.6	10.9	11.8	13.1	15.9	**16.4**	**17.1**	**17.9**
Tajikistan	36.3	35.5	32.4	29.2	28.2	34.1	**46.9**	**58.1**
Turkmenistan	4.1	10.0	18.1	20.8	17.4	23.2	**23.2**	**23.4**
Uzbekistan	10.0	9.1	8.6	8.3	7.6	**10.8**	**15.1**	**13.9**

Source: IMF; Regional Economic Outlook; Middle East and Central Asia (October, 2016)

The problem is augmented due to the slow growth rates, low oil prices and upcoming expenditure pressures with the aging population in the sub-region. North and Central Asian countries are taking steps to streamline their expenditures and, improve tax system and administration. In this area, there is room for improvement which could ultimately free resources for infrastructure investments. For instance, ***Georgia*** recently raises excise taxes on tobacco, alcohol and fuel as well as increases taxation of gambling. On the expenditure side, there were cuts applied to wage and administrative spending while expenditures in healthcare programs were streamlined. Likewise, ***Armenia*** intends to use taxation for generating the revenues to finance its infrastructure development. The measures envisaged for 2017-2021 include rise of excise rates for alcohol, tobacco and fuels, increased taxation of gambling as well as broadening the VAT (IMF, 2016).

Table 14: Tax Revenue (percentage of GDP)

	2008	2009	2010	2011	2012	2013	2014	2015
Armenia	17.3	16.5	17.1	17.2	17.5	..	21.6	..
Azerbaijan	16.4	14.1	12.2	12.2	13.0	13.5	14.2	..
Georgia	23.8	23.1	22.1	23.8	24.1	23.4	23.5	23.8
Kazakhstan	..	..	15.7	18.3	13.3	16.0	14.2	9.8
Kyrgyzstan	16.5	15.0	15.0	16.1	18.1	17.6	17.7	..
Russian Federation	15.8	13.0	13.0	14.1	14.0	13.3	13.4	10.9

Source: WB; World Development Indicators

Facing increased budgetary pressure, ***Azerbaijan*** decided to cut infrastructure spending. The authorities also increased mineral royalty tax rates, raised the threshold on the simplified tax, upgraded checks on tax evasion and increased administrative measures (expected savings are 0.5 percent of GDP). The authorities expect to raise more taxes by simplifying the tax system and introducing accessible eservices (IMF, 2016).

Similarly, in response to fiscal pressures, the authorities in ***Turkmenistan*** have raised import duties, and cut investment spending (by over 20 percent in 2015), reduced utility subsidies and social spending. More capital spending cuts were envisaged in 2016 (IMF, 2017).

In the ***Russian Federation***, the Federal Tax Service implemented measures to improve tax and customs administration. The WB study "Systematic Country Diagnostics: Pathways to Inclusive Growth" (2016), showed a strong improvement in the user perception of the quality of customs services, responsiveness and integrity. This has resulted in greater taxpayer compliance (WB, 2016).

Substantial improvements in taxation can also be achieved in ***Kyrgyzstan*** and non-tax revenues have even greater room for improvement (IMF Article IV report provides recommendation in this respect (IMF, 2016)).

5.2. Multilateral Development Banks

Most of North and Central Asian countries have access to concessional financing from Multilateral Donors. Interest rates on loans received from Multilateral Development Banks (MDBs) are well below the market rate and maturities are quit long, sometimes up to 40 years.

However, borrowing conditions are gradually tightening in conjunction with the economic development of countries in the region. For example, WB and ADB both have tightened their conditions for Georgia although the revised conditions are still below the market rates. MDBs often couple infrastructural loans with Technical Assistance (TA), as well as conditionalities, in order to maximize the success rate of infrastructure projects. On the other hand, strict procedures imposed by MDBs may lengthen the project implementation.

MDBs finance various sectors, including infrastructure for energy, transport, water and ICT. Among these four sectors, probably ICT is the one for which countries borrow the least. Still, numbers are impressive. During 2000–2015, ADB financed projects worth of USD11.91 billion in ICT area, of which 8 percent was stand-alone ICT projects and 92 percent projects - with ICT component. During the same period, World Bank Group provided for ICT related projects about USD20 billion, EIB - USD35 billion and EBRD about USD3.8 billion (ADB, 2016).

Bellow table shows allocation of resources by various MDBs to North and Central Asian countries by sector. Allocations from donors are significant. For example, for Kyrgyzstan, ADB only has allocated funds equal to 7.4 percent of GDP for next three years. It doesn't mean though that countries can easily get financing for any project as MDBs have their priorities and restrictions. However,

borrowing is rather constrained by budget deficit and debt sustainability considerations than availability of funding.

Table 15: Investments of International Financial Institutions

	ADB-Investment plans for countries by sectors 2017-2019 (USD million)				EIB-Signed in 2014-2016 (EUR million)				EBRD-ongoing (EUR million)			WB-approved in 2014-2016 (USD million)					IDBG-approved in 2014-2016 (USD million)		
	Transport	**Water**	**Energy**	**Total**	Transport	Water	Energy	**Total** *(including other sectors)*	Energy	Other Infrastructure	**Total (includes noninfrastructure)**	Transport	Energy	Water	ICT	Total (including other sectors)	Transport	Energy	Total (including other sectors)
Armenia	40	50	80	**295**	51	30	10	**200**	44	78	**305**	95	100	130	21	**594**			
Azerbaijan	200	125	790	**1115**				**95**	387	404	**947**	190		200	100	**507**	224		**254**
Georgia	479	110	50	**739**	300	100		**777**	294	58	**720**	354	60	99	40	**721**			
Kazakhstan	801	130	80	**1201**				**200**	1069	1131	**2704**	978				**2416**	273	75	**790**
Kyrgyzstan	160	88	150	**493**		20		**90**	97	86	**267**		25	43	3	**252**	12	60	**117**
Tajikistan	75	25	75	**319**			70	**70**	163	127	**384**			23	12	**106**	20	70	**139**
Turkmenistan	100		500	**800**						1	**53**							700	**700**
Uzbekistan	580	340	2605	**3930**						2	**8**	445	150	105	20	**1173**			

Sources: ADB; Country operations business plans[17] ; EIB; Projects Finances Multi Criteria List[18]. EBRD[19]; WB[20]; Islamic Development Bank Group (IDBG[21]).

Another financing source of growing importance is coming from export credit agencies (ECAs). Japan, China, Republic of Korea and some European countries provide development assistance in infrastructure on a bilateral basis. This assistance often requires that a large component of the project is purchased from the financing country, but the terms of borrowing conditions are usually favorable.

Following the Belt and Road Initiative, dedicated financial institutions have also been set up to support infrastructure development such as the China-led USD40 billion Silk Road Fund. In addition, the Asian Infrastructure Investment Bank was founded with USD100 billion committed as well as the New Development Bank established by BRICS group (Brazil, Russia, India, China and South Africa) with USD50 billion of initial capital. These banks should provide additional funding opportunities for borrowers and enhance competition among MDBs (CLSA, 2017).

[17] https://www.adb.org/search/series/country-operations-business-plans

[18] *http://www.eib.org/projects/loan/list/index;*

[19] *http://www.ebrd.com/where-we-are.html;*

[20] *http://projects.worldbank.org/country?lang=en&page;*

[21] http://www.isdb.org/irj/go/km/docs/documents/IDBDevelopments/Internet/English/IDB/CM/IDB20Group20Data/CountryApprovals_Main.htm

5.3. Official Development Assistance (ODA)

For eight countries of the region (all accept Russian Federation) total international support to infrastructure in 2014 amounted USD3 billion; almost 1/3 of which was ODA for economic infrastructure (the rest was social infrastructure such as hospitals and schools).

Table 16: ODA for Economic Infrastructure (USD Million)

Country	2007	2008	2009	2010	2011	2012	2013	2014
Armenia	43	109	173	102	62	76	85	112
Azerbaijan	52	59	80	38	144	180	86	112
Georgia	96	179	185	211	149	286	284	237
Kazakhstan	98	146	82	46	14	29	42	20
Kyrgyzstan	21	24	30	56	99	82	109	120
Tajikistan	20	15	37	125	96	102	148	144
Uzbekistan	17	66	53	64	42	48	132	117
Turkmenistan	0	1	1	1	1	2	1	3

Source: UNESCAP[22]

Countries could consider how to better leverage grants from donors to attract additional funding for infrastructure projects. For instance, the EU created the Neighbourhood Investment Facility (NIF), which allocates grants to EU partner countries covered by European Neighborhood policy (ENP) to co-finance capital intensive infrastructure projects. Between 2008 and 2015 NIF has allocated up to €600 million for 6 countries from Eastern Neighborhood (including Armenia Azerbaijan, Georgia). NIF financing complements bilateral loans from EU member countries or loans from eligible multilateral banks: European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD), Council of Europe Development Bank (CEB). A similar example is the Eastern Europe Energy Efficiency and Environment Partnership (E5P) of which Armenia and Georgia are members. E5P grants intend to complement loan funding and make investments financially viable. These grants can be used for municipal infrastructural projects with energy efficiency gains.

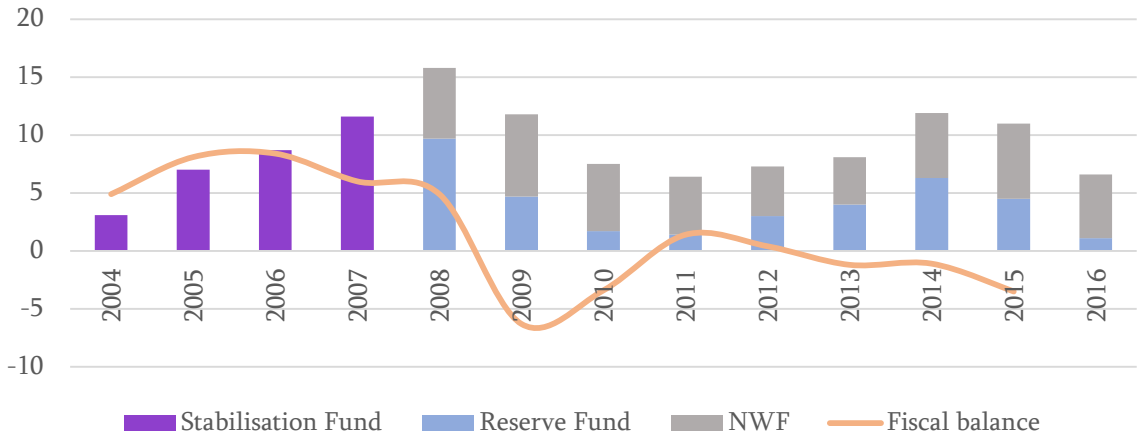
Grants are also used to support the preparation of viable projects. For instance, the Word Bank's Global Infrastructure Facility (GIF) was launched to facilitate the preparation and structuring of complex infrastructure projects through PPP arrangements. Governments do not pay directly for GIF's participation in the project. However, if the project reaches financial closure, the GIF costs are embedded into the project overall cost.

[22] *http://data.unescap.org/escap_stat/#data/*

5.4. Role of quasi fiscal sources in financing infrastructure

In 2004, the ***Russian*** Stabilization Fund was created and subsequently split in 2008 into two funds: Reserve Fund and National Welfare Fund. The Reserve Fund was created to protect government finances from oil price fluctuations, while the National Welfare Fund was created to diversify investments and back future pension liabilities. In 2008, the fiscal buffer allowed the government to act counter-cyclically and limit the effect of the financial crisis. In 2015, the Russian government loosened the rule of using the National Welfare Fund and financed number of projects with total cost of USD15 billion, including a new Central Ring Road in Moscow, upgrades of the Trans-Siberian and Baikal-Amursk railways, and projects to improve energy efficiency and internet connectivity. The National Welfare Fund was also used to support large banks. Assets of the National Welfare Fund stand at 6 percent of GDP and there is risk that it will not be sufficient to cover gap in pension liabilities (WB, 2016).

Figure 11: Russia's Oil and Gas Funds (percent of GDP)



Source: IMF; Article IV (2006-2016)

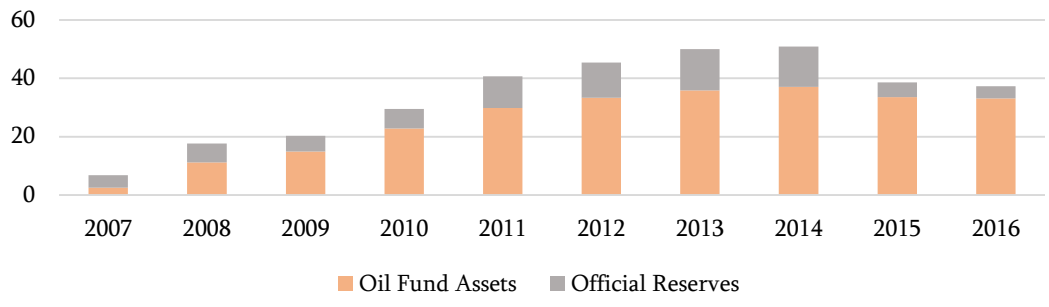
In 2000, ***Kazakhstan*** established an off-budget fund - National Fund of the Republic of Kazakhstan (NFRK). NFRK is managed conservatively and helped the country to ensure that government revenue volatility does not translate into expenditure volatility. NFRK accumulated windfall revenues during the booming years and was used to provide fiscal stimulus to the economy during the 2008-2009 crisis (estimated at 7.5 percent of GDP). NFRK operations are governed by legislation and include a ceiling in nominal value of expenditures, floor on balance of the fund and others (IMF, 2013). In addition, the legislation on NFRK includes a provision that interest payments on government debt should not exceed interest income earned by NFRK. While there is room for streamlining the various anchors, as has been recommended by the IMF, the frameworks in place point to the authorities' commitment to prudent management of oil wealth. In 2014, Kazakhstan announced a three–to–five–

year stimulus package to modernize critical infrastructure. The plan amounted USD12 billion (5¾ percent of GDP) of which part is to be financed through NFRK and USD7 billion (3 percent of GDP) with loans from international development bank (Nurbayev, 2017). The government of Kazakhstan has actively used its public enterprises sector to implementing its plans. The most important player is an investment holding company, Samruk Kazyna (SK), which played a key role in the government's stimulus efforts during the crisis years. The biggest subsidiary companies of the fund are National Company KazMunayGas, KMG Kashagan B.V., Kazakhstan Temir Zholy, Kazatomprom, and Samruk-Energy. Kazakhstan should be praised for the actions taken to improve the transparency of quasi-fiscal operations, in particular, for the decision that requests costs of non-commercial nature from SK companies to be covered from the state budget.

In 2006, the Fund for Reconstruction and Development of ***Uzbekistan*** (FRD) was established with a dual goal: accumulate revenue in excess of the established cut-off prices on mineral resources and stimulate investment and economic development. FRD is extending long-term loans to banks for co-financing of strategic government-selected projects. Most of the reserves of the fund are managed abroad by the Central Bank of Uzbekistan (IMF, 2013). Government of Uzbekistan has announced number of programs for 2015–2019. These programs include establishment of export fund, introduction of corporate governance standards for state-owned enterprises (SOEs), and a major privatization program. Privatization program included sale of stakes in the 1,247 SOEs. About 305 were privatized in the first half of 2016 (WB, 2017).

Between 2008 and 2016, ***Azerbaijan*** public investment has averaged about 15 percent of GDP, which was supported by budgetary transfers from the Oil Fund (SOFAZ). In 2015, Azerbaijan was hit by external shocks. Plummeted oil prices, and slowdown in the region created exchange rate pressure. Central Bank's reserves depleted from USD13.8 billion at end-2014 to USD4.3 billion by end-June 2016 and the fixed exchange rate was devaluated twice by 25 and 32 percent. Public debt increased from 11.2 percent of GDP in 2014 to 27.9 percent of GDP in 2015 approaching 40 percent in 2016. In the medium term, the government could cover its budget deficit with transfers from SOFAZ, but for longer term sustainability adjustments will be necessary (IMF, 2016).

Figure 12: Oil Fund of Azerbaijan Assets and Gross Official Reserves (USD billion)



Source: IMF Article IV Reports (2011, 2014, 2016)

The ***Turkmen*** Government created its Stabilization Fund (SF) in 2008 to implement a fiscal stimulus package to support the domestic economy. In 2011, the State Development Bank of Turkmenistan (SDBT) was established to provide credit to public sector entities directly or through domestic banks, for the implementation of projects approved by the President of Turkmenistan (Simsek, 2017). The IMF recommends effective implementation of reforms of state-owned enterprises and privatization, together with the greater efficiency of public spending. The authorities intend to embed these reforms in the upcoming 7-year development plan for 2017-23 (IMF, 2017).

In North and Central Asian countries creation of dedicated funds is not limited to Oil and Gas exporting countries. In 2011 ***Georgia*** has created JSC Partnership Fund (PF). PF was created on the basis of consolidation of the ownership of the largest Georgian SOEs operating in transportation, and energy sectors. Dividends received from SOEs and borrowing are the revenue source of PF resources for investment.

5.5. Private sector and Public-Private Partnerships

Infrastructure projects have typically the following main characteristics: 1. Externalities that are not easy to estimate and even more difficult to charge to the beneficiaries; 2. Governments willingness to retain control over assets to avoid abuse of monopolistic power; 3. Long payoff period, high initial risks and illiquidity. These characteristics make pure private investment difficult and costly (Ehlers, 2014).

However, private sector can play an important role in investment activities. On average the private sector invests three times more than public sector based on data of gross fixed capital formation in all sectors. Private sector investment to GDP ratio is much higher than public investment although most of it is not related to infrastructure development.

Among the eight North and Central Asian countries, Kyrgyzstan has the highest rate of private investment to GDP ratio - 117 percent, while highest rate of spending by the government – 52 percent - is in Tajikistan. Reported participation of the private sector in investments in infrastructure (transport, energy, water and ICT) in North and Central Asian countries during 1990-2015 reached USD200 billion.

Table 17: Investment Volumes as Percentage of GDP (2006-2015)

	Government	Private Sector	PPP
Armenia	15	93	14
Azerbaijan	42	50	0
Georgia	29	67	2
Kazakhstan	27	99	0

Kyrgyzstan	35	117	0
Russian Federation	25	103	1
Tajikistan	52	28	8
Uzbekistan	4	56	0
Average for all countries per year	2.8	7.7	0.3

Source: IMF[23] and author's calculations (Percentages are calculated as a fraction of GDP 2011 in international dollars)

Table 18: Private Participation Reported in Infrastructure (1990-2015)

	Armenia	Azerbaijan	Georgia	Kazakhstan	Kyrgyzstan	Russian Federation	Tajikistan	Turkmenistan	Uzbekistan
USD million									
Airports	304	x	105	31	x	2,120	x	x	x
Electricity	836	375	1,542	1,542	x	33,711	956	x	x
ICT	1,246	2,138	1,337	9,610	409	90,138	526	267	3,960
Natural gas	0	x	145	604	40	12,993	x	x	x
Railways	575	x	x	231	x	218	x	x	25
Ports	X	x	468	x	x	4,519	x	x	x
Roads	X	x	x	x	x	8,542	x	x	x
Water and Sewerage	0	0	435	0	0	3,185	x	x	0
Total investment	**2,961**	**2,515**	**4,031**	**12,018**	**449**	**155,426**	**1,482**	**267**	**3,985**
Sector with largest investment share	ICT	ICT	Electricity	ICT	ICT	ICT	Electricity	ICT	ICT
Type of PPI with largest share in investment	Divesti ture	Green field	Green field	Divesti ture	Green field	Green field	Green field	Green field	Green field
Projects cancelled or under distress (Number)	0	4	2	12	1	3	0	0	3
Projects cancelled or under distress (percent of total investment)	0	17	1	8	0	0	0	0	35

Source: WB; Private Participation in Infrastructure Database[24]

[23] http://www.imf.org/external/np/fad/publicinvestment/pdf/csupdate_jan17.pdf
[24] https://ppi.worldbank.org/snapshots/country/georgia

In order to attract more private investment, governments need to create a favorable environment and build internal capacity to develop PPP projects. A favorable environment for investment implies level playing field for all the participants, certainty of regulatory environment, low level of perceived political and governance risks, adequate utility tariffs that cover not only the volume of investment, but adequately accounts for the risk of investment (McKinsey&Company, 2016), access to land, streamlined permit approvals and so on. When SOEs dominate a sector, private investors are reluctant to enter the market as fair competition is deemed difficult to achieve.

In a context of increasing financing needs and scarcity of resources, a natural option is PPPs. Besides easing the pressure on public finance, PPPs may result in more efficient public service delivery and savings over the project lifecycle. These benefits have to be large enough to balance the typically higher cost of borrowing that the private sector faces compared to the Government. Past projects show though that savings can be significant. In Australia, rail infrastructure was produced with 30 percent savings while five water projects in Singapore have been developed with lower costs, partly due to the innovations in design and improved technologies (IMF, 2015). In addition, PPP arrangements allow the government to shift risks to the private sector such as construction and operation risks.

However, if not properly designed, PPP projects may lead to higher cost and/or contingent liabilities for the Government and past results have been mixed (Dintilhac, 2015). A possible reason for this mixed experience is the lack of country's readiness and capacity to identify, implement and managed PPP projects. Achieving efficiency gains should be the driving force to enter into a PPP arrangement and not the possibility to circumvent budgetary constraints and delay recording of fiscal costs (IMF, 2015). If purely selected for accounting reasons, the involvement of the private sector is unlikely to lead to better results. Bringing public accounting standards in line with corporate accounting so that infrastructure assets are depreciated over their life cycle rather than adding to deficits during construction, could reduce government's bias for the PPP options.

As PPP arrangements are about long-term partnership, Governments need to learn about managing long term relationships, not only in terms of managing the fiscal risks, but also in terms of fair treatment of the private sector. Treatment of the private sector should be consistent and the continuity of contracts should be ensured irrespective of changes of government administrations.

5.5.1. PPP framework

There is a growing interest for PPP projects in North and Central Asia:

- ***Georgia*** is developing its PPP law with donor assistance (ADB, EBRD) and it has already entered in a number of PPP arrangements. The latest PPP project awarded in the country is the New Deep Water Sea Port of Anaklia, with an initial handling capacity of 7 million tons and an estimated total value of USD2.5 billion.

- In ***Uzbekistan***, there is a PPP law since 1995 but no detailed selection process. The government shows high interest in developing PPP projects and sees it as an instrument to overcome budgetary constraints in infrastructure development (pppknowledgelab, 2017).
- In ***Kazakhstan***, there are two agencies playing important role in PPP arrangements: the Kazakhstan Public-Private Partnership Center (PPP Center) and the PPP Advisory Center (PPPAC). The PPP Center has a mandate of project preparation while PPPAC is providing advisory services to line ministries on PPP-related tasks.
- In 2012, **Tajikistan** and **Kyrgyzstan** have developed PPP laws with donor assistance.
- While **Armenia** doesn't have a dedicated PPP law, its Public Procurement Law (2011) covers PPPs and requires open bidding or competitive dialogue with some flexibility for direct negotiations.
- **Russian Federation** has the richest experience in implementing PPPs although volumes are lower than in comparable countries. Private investors might have concerns about perceived political and governance risks, including the legal and regulatory framework and the difficulty of protecting property rights. The shallow domestic capital market, lack of affordable long-term debt and equity financing can also limit access to finance for PPPs. Fragmentation and complexity of legislation together with the lack of capacity to prepare and deliver projects at federal and subnational levels, and absence of a solid public investment management framework are another constrain for PPP project implementation (WB, 2016).

Table 19: Number and Investment Volumes of PPP Projects Since 1990

	Projects reaching financial closure	Total investment committed to PPPs (US$ million)
Armenia	8	1079
Azerbaijan	4	375
Georgia	12	1042
Kazakhstan	8	885
Kyrgyzstan	2	5
Russian Federation	61	28411
Tajikistan	3	956
Uzbekistan	2	320

Source: PPP Knowledge Lab[25]

[25] *https://pppknowledgelab.org/countries*

A strong institutional framework is required for the efficient use of PPP arrangements and to avoid unexpected fiscal costs. The Economist Intelligence Unit's study evaluates PPP readiness in 21 countries, mostly in Asia-Pacific. Kyrgyzstan, Tajikistan and Georgia rank at bottom three positions, with Armenia and Kazakhstan somewhat higher in the list (EIU, 2015).

Table 20: Institutional Readiness for PPPs

	Armenia	Georgia	Kazakhstan	Kyrgyzstan	Tajikistan
	Score	**Score**	**Score**	**Score**	**Score**
Overall Score	**38**	**26.2**	41.4	**29.5**	**28.7**
1) Regulatory Framework	34.4	25	37.5	53.1	43.8
2) Institutional Framework	16.7	0	41.7	16.7	25
3) Operational maturity	31.4	15.8	15.7	12.5	15.7
4) Investment Climate	76	61.8	70	48.1	44.3
5) Financial Facilities	33.3	38.9	55.6	8.3	8.3
6) Subnational Adjustment	50	25	25	25	25
	Rank	**Rank**	**Rank**	**Rank**	**Rank**
Overall Rank	**16**	**21**	13	**19**	**20**
1) Regulatory Framework	16	20	15	8	10
2) Institutional Framework	19	21	13	19	17
3) Operational maturity	15	17	18	20	18
4) Investment Climate	6	12	9	20	21
5) Financial Facilities	16	13	11	20	20
6) Subnational Adjustment	6	14	14	14	14

Source: Infrascope 2014[26]

The successful implementation of a PPP programme also necessitates clear and adequate procedures. The WB's study "Benchmarking Public-Private Partnerships Procurement 2017" (WB, 2017) assesses government's practices in terms of PPP projects preparation, procurement, and management. Scoring is provided for five countries of the North and Central Asian Region. Both rankings described in this section show that North and Central Asian countries have a long way to go to further develop their PPP frameworks.

Table 21: Benchmarking Public-Private Partnerships Procurement

	Armenia	**Kazakhstan**	**Kyrgyzstan**	**Tajikistan**	**Russian Federation**
Preparation of PPPs	38	56	50	38	46
Central Budgetary Authority's approval	Yes	Yes	Yes	Yes	No
PPP's prioritization consistent with public investment prioritization	No	Yes	Yes	No	Yes
Economic analysis assessment	No	Yes	Yes	Yes	Yes

[26] https://www.adb.org/sites/default/files/publication/158409/2014-infrascope.pdf

Fiscal affordability assessment	No	Yes	Yes	Yes	Yes
Risk identification	Yes	Yes	Yes	Yes	Yes
Financial viability assessment	Yes	Yes	No	Yes	No
PPP vs. Public Procurement comparative assessment	Yes	Yes	Yes	Yes	Yes
Market assessment	No	Yes	No	Yes	No
Draft PPP contract included in the request for proposals	Yes	Yes	Yes	Yes	Yes
Standardized PPP model contracts and/or transaction documents	Yes	Yes	No	No	No
Procurement of PPP	75	63	63	75	75
Evaluation committee members required to meet specific qualifications	No	No	Yes	Yes	No
Public procurement notice of the PPP issued by procuring authority	Yes	Yes	Yes	Yes	Yes
Available online Minimum period of time to submit the bids (>=30 days)	Yes	Yes	Yes	Yes	Yes
Tender documents detail the stages of the procurement process	Yes	Yes	Yes	Yes	Yes
Clarification questions for procurement notice and/or the request for proposals	Yes	Yes	Yes	Yes	Yes
Financial model submitted with proposal	No	No	No	No	No
Proposals strictly and solely evaluated in accordance with published evaluation criteria	Yes	Yes	Yes	Yes	Yes
Procedure when only one proposal is received	Yes	Yes	Yes	Yes	Yes
Publication of award notice	Yes	Yes	Yes	Yes	Yes
Notification of the result of the PPP procurement process	Yes	No	Yes	Yes	Yes
Regulation of negotiations with the selected bidder before contract signing	Yes	Yes	No	No	Yes
Publication of contract	No	No	No	No	No
Unsolicited proposals	not regulated	33	50	50	75
Assessment to evaluate unsolicited proposals		Yes	Yes	Yes	Yes
Consistency with government priorities evaluated Competitive PPP procurement procedure for USP		Yes	Yes	Yes	Yes
Minimum period of time to submit the bids (>=90 days)		No	Yes	Yes	Yes
PPP contract management	0	58	58	66	41
System to manage the implementation of the PPP contract	No	Yes	Yes	Yes	Yes
Monitoring and evaluation system	No	Yes	Yes	Yes	Yes
PPP performance info available online	No	Yes	Yes	Yes	No
Regulation of a change in the structure (i.e. stakeholder composition) of the private partner	No	Yes	Yes	Yes	No
Regulation of modification/renegotiation of the PPP contract (once the contract is signed)	No	Yes	Yes	Yes	Yes
Regulation of circumstances that may occur during the life of the PPP contract (e.g. Force Majeure)	No	Yes	Yes	Yes	Yes
Dispute resolution mechanisms	No	Yes	Yes	Yes	No
Lenders step-in right	No	Yes	Yes	Yes	No
Grounds for termination of a PPP contract	No	Yes	Yes	Yes	Yes

Source: PPP Knowledge Lab[27]

[27] *Numbers are scaled between 0-100 and show how far country is from the best practice (100)* https://pppknowledgelab.org/

5.6. Access to Financial Resources

Resources on financial markets, if directed to investment in infrastructure, could provide significant funding. Institutional investors, such as pension funds and insurance companies, hold assets worth USD100 trillion while the world's GDP in 2016 was around USD75 trillion. Institutional investors yet prefer to invest in government bonds and other fixed income securities, which are considered safer and more liquid assets (Arezki, 2016).

Institutional investors should though be willing to invest into long-term assets given their long-term liabilities. Still, not many of these resources are allocated to infrastructure. The high initial risk associated with infrastructural projects might be a barrier for institutional investors. At an initial stage, bank loans have some advantages over bonds such as: enough expertise to monitor projects, gradual fund disbursements based on the project needs and easier debt restructuring process if necessary. However, banks should be reluctant to hold long term assets as they have mainly short term liabilities. The operational phase with stable underlying cash flows is an appropriate financing instrument for institutional investors (Ehlers, 2014).

Development banks and export credit agencies can also provide some comfort to investors for infrastructure projects, especially using guarantees or mezzanine capital. Also the development of local capital markets is important for enabling infrastructure bonds. In this regard, the Russian Capital market is the largest one in the region. Russia, Kazakhstan and Armenia have similar amount of outstanding government papers as share of GDP in their domestic market although these levels are quite low compared to other regions.

Table 22: Total Value of Government and Corporate Bonds as Percent of GDP

		2008	2009	2010	2011	2012	2013	2014	2015	2016
Armenia	Government Bonds	0.9	1.0	1.0	1.7	2.6	2.7	3.2	5.1	9.0
	Corporate Bonds									0.1
Azerbaijan	Government Bonds							0.1	0.1	0.3
	Corporate Bonds			0.2	0.3	0.3	0.4	0.5	0.6	0.6
Georgia	Government Bonds					0.4	0.7	1.4	2.3	5.1
	Corporate Bonds								0.1	0.3
Kazakhstan	Government Bonds	1.0	3.0	4.7	5.9	7.6	7.9	8.7	9.7	9.2
	Corporate Bonds	2.0	5.6	6.3	4.9	5.0	5.1	5.8	9.6	8.8
Kyrgyzstan	Government Bonds								1.0	3.5
Russian Federation	Government Bonds	1.3	1.4	1.3	2.8	3.8	5.5	7.0	8.3	8.6
	Corporate Bonds	0.4	0.9	1.0	1.2	1.6	2.9	4.5	6.0	7.9

Source: Bloomberg and author's calculations

Not surprisingly on international markets Russia has largest amount of outstanding bonds.

Table 23. Outstanding Bonds on the Market

Country	Currency	Amount Outstanding (MLN)		Corporate Bonds Outstanding Amount		# Companies Listed
		In issuance currency (MLN)	Equivalent in USD (MLN)	In issuance currency (MLN)	Equivalent in USD(mln)	
Armenia	AMD	514,576	2,062	6,142	66	3
	USD	1,000		53		
Azerbaijan	AZN	387	1,480	315	4,448	1
	USD	1,250		4,260		
Georgia	GEL	2,220	1,410	94	1,336	8
	USD	500		1,278		
	ILS	-		70		
Kazakhstan	KZT	4,145,489	21,251	4,169,197	37,184	24
	USD	7,461		23,081		
	CHF	-		285		
	EUR	600		465		
	JPY	-		11,000		
Kyrgyzstan	KGS	24,211	408	-	-	-
	USD	49		-		
Russian Federation	RUB	7,631,769	170,368	7,871,770	145,672	376
	USD	35,281		7,182		
	EUR	750				

Source: Bloomberg

6. Conclusion: Strategies for Bridging the Gap

Governments are looking for options to develop and rehabilitate infrastructure assets in the region and various instruments can be exploited for their financing. Depending on country circumstances and stage of project implementation, certain instruments are more advantageous than others.

While financial resources are available from financial markets and external partners, borrowing is constrained due to rising budget deficits and debt sustainability considerations in the region. Low oil prices and limited growth put downward pressure on budget revenues at a time where current expenditures are expected to grow, primarily due to the aging population. Increasing debt levels and in some cases fiscal rules call for tighter fiscal policy. The combination of these factors limits governments' flexibility to address infrastructure needs through the state budget. Also there is an argument that public finance accounting leads to unfair treatment of infrastructure investments by increasing budget deficit at the time of investment, instead of accounting for gradual depreciation.

To narrow the financing gaps, significant savings can be realized by improving the efficiency of infrastructure expenditures. Large deviations from planned investments, as well as high volatility in investment volumes over years, suggest the need for improving PIM institutions. Studies show that some countries manage to achieve the same level of infrastructure services for a lower investment

amount. Strengthening institutional arrangements at the stages of planning, budget allocation and implementation should result in better infrastructure outcomes. Also, revising fiscal rules to govern directly investment amounts and allow better predictability could make investments more efficient and less pro-cyclical.

Although benefits from infrastructure are difficult to estimate, cost-benefit and value for money analyses are important for efficient project selection and need to be reinforced. This is often lacking in the region. At the selection stage, countries would also benefit from regional coordination to avoid overinvestment and plan regional infrastructure networks. Maintenance costs have also to be integrated into investment planning decisions while ensuring timely maintenance expenditures will reduce investment needs.

While providing basic infrastructure services is a government responsibility, it does not mean that everything necessarily needs to be done by the government and the private sector can play an active role. In this respect, the government obligation is to create the conditions under which the private sector is incentivized to provide better infrastructure services without jeopardizing fiscal stability (for example through contingent liabilities). To make the most of PPPs, a supportive PPP framework is required and this framework should include a strong legal and regulatory base as well as sufficient institutional capacities. PPPs require new skills from the government for entering in long-term relationship with sophisticated private sector representatives. This includes not the management of quasi fiscal risks.

Overall, the private sector can play greater role in financing infrastructure if adequate conditions are created. This may include low political and governance risks, regulatory certainty, level playing field for businesses and other aspects of ease of doing business. Low and/or subsidized tariffs may yet impede competition, reduce private sector's interest and constrain sector development. The private sector has to be able to adequately charge for the costs incurred and risks supported. Important impediment for private sector participation is the underdevelopment of financial markets that limits access to finance. For example, private companies in most countries in the sub-region cannot raise long-term finance on stock markets.

Raising user charges, using value capture mechanisms and privatization are other options to generate funds for new investments. Privatization may include areas traditionally considered to be exclusively public such as the private ownership of railways in the UK. Likewise, Philippines and some other countries can serve as examples of private participation in transmission line construction for instance.

Involving the private sector in infrastructure development will take time. Meanwhile, International Financial Institutions (IFIs) and development partners can assist countries in a) advising governments on structural reforms; b) providing expert/advisors for individual projects; c) offering comfort to the private sector on behalf of the government (for example through guarantees and mezzanine capital). Governments should head towards established best practices, but also they should learn from their peers.

References

ADB. (2011). *Country Partnership Strategy: Kazakhstan 2012–2016 - Sector Assessment (Summary): Energy.* Manila: Asian Development Bank.

ADB. (2011). *Country Partnership Strategy: Kazakhstan 2012–2016 - Sector Assessment (Summary): Multisector (Urban Transport, Water Supply and Sanitation, and Other Municipal Services).* Manila: Asian Development Bank.

ADB. (2011). *Country Partnership Strategy: Uzbekistan 2012–2016 - Sector Assessment (Summary): Energy.* Manila: Asian Development Bank.

ADB. (2011). *Country Partnership Strategy: Uzbekistan 2012–2016 - Sector Assessment (Summary): Transport and ICT.* Manila: Asian Development Bank.

ADB. (2011). *Country Partnership Strategy: Uzbekistan 2012–2016 - Sector Assessment (Summary): Water Supply and Sanitation, Waste Management, Urban Transport and Other Municipal Services.* Manila: Asian Development Bank.

ADB. (2011). *Country Partnershipp Strategy :Kazakhstan (2012-2016) - Sector Assessment (Summary): Transport and ICT.* Manila: Asian Development Bank.

ADB. (2012). *Country Partnership Strategy: Kyrgyz Republic, 2013–2017 - Sector Assessment (Summary): Energy.* Manila: Asian Development Bank.

ADB. (2012). *Country Partnership Strategy: Kyrgyz Republic, 2013–2017 - Sector Assessment (Summary): Transport.* Manila: Asian Development Bank.

ADB. (2012). *Country Partnership Strategy: Kyrgyz Republic, 2013–2017: Sector Assessment (Summary): Water Supply and Other Municipal Infrastructure and Services.* Manila: Asian Development Bank.

ADB. (2013). *Country Partnership Strategy: Armenia, 2014–2018 - Sector Assessment (Summary): Transport.* Manila: Asian Development Bank.

ADB. (2013). *Country Partnership Strategy: Armenia, 2014–2018 - Sector Assessment (Summary): Water and Other Urban Infrastructure and Services.* Manila: Asian Development Bank.

ADB. (2013). *Country Partnership Strategy: Armenia, 2014–2018: Sector Assessment (Summary): Energy.* Manila: Asian Development Bank.

ADB. (2013). *Country Partnership Strategy: Azerbaijan, 2014–2018 - Sector Assessment (summary): Energy.* Manila: Asian Development Bank.

ADB. (2013). *Country Partnership Strategy: Azerbaijan, 2014–2018 - Sector Assessment (Summary): Transport.* Manila: Asian Development Bank.

ADB. (2013). *Country Partnership Strategy: Azerbaijan, 2014–2018 - Sector Assessment (Summary): Water snd Other Urban Infrastructure and Services.* Manila: Asian Development Bank.

ADB. (2013). *Country Partnership Strategy: Georgia, 2014–2018 - Sector Assessment (Summary): Energy.* Manila: Asian Development Bank.

ADB. (2013). *Country Partnership Strategy: Georgia, 2014–2018 - Sector Assessment (Summary): Transport.* Manila: Asian development Bank.

ADB. (2015). *Country Partnership Strategy: Tajikistan, 2016–2020 - Sector Assessment (Summary): Energy.* Manila: Asian Development Bank.

ADB. (2015). *Country Partnership Strategy: Tajikistan, 2016–2020 - Sector Assessment (Summary): Transport.* Manila: Asian Development Bank.

ADB. (2016). *Road to 2030: Information and Communications Technology in ADB's Corporate Strategy and Operations.* Manila: Asian Development Bank.
ADB. (2017). *Meeting Asia's Infrastructure Needs.* Manila: Asian Development Bank.
Arezki, R. e. (2016). *IMF Working Paper - From Global Savings Glut to Financing Infrastructure: The Advent of Investment Platforms (WP/16/18).* Washington DC: International Monetary Fund.
CLSA. (2017, May 26). *One Belt, One Road: A Briliant Idea*. Retrieved from https://www.clsa.com/special/onebeltoneroad/
Dintilhac, C. e. (2015). *The Economic Impact of Infrastructure and Public-Private Partnerships: Literature Review (Draft version 1.0).* Washington DC: WB.
Ehlers, T. (2014). *Working Papers No: 454 Understanding Challenges for Infrastructure Finance.* Bank for International Settelments.
EIU. (2015). *Evaluating the environment for public-private partnerships in Asia-Pacific: The 2014 Infrascope.* The Economist Intelligence Unit Ltd., and Asian Development Bank.
Ernst & Young . (2014). *The road to 2030: a survey of infrastructure development in Russia.* Ernst & Young .
GSE. (2017). *Ten Year Network Development Plan of Georgia for 2017-2027.* Tbilisi: JSC "Georgian State Electosystem".
Horton M., e. a. (2016). *Exchange Rate Developments and Policies in the caucasus and Central Asia.* Washington DC: MCD, International Monetary Fund.
IMF. (2013). *Country Report No 13/291.* Washington DC: International Monetary Fund.
IMF. (2013). *Country Report No: 13/278.* Washington DC: INternational Monetary Fund.
IMF. (2014). Is it Time for Infrastructure Push? The Macroeconomic Effects of Public Investment. In e. b. others, *World Economic Outlook (October)* (pp. 75-114). Washington DC: International Monetary Fund.
IMF. (2014). *The Kyrgyz Republic : Poverty Reduction Strategy Paper.* Washington DC: International Monetary Fund.
IMF. (2014). *The Kyrgyz Republic : Poverty Reduction Strategy Paper.* Washington DC: International Monetary Fund.
IMF. (2015). *Policy Paper: Making Public Investment More Efficient.* Washington DC: International Monetary Fund.
IMF. (2016). *Country Report No 16/296.* Washington DC: International Monetary fund.
IMF. (2016). *IMF Country Report No 16/380.* Washington DC: International Monetary Fund.
IMF. (2016). *IMF Country Report No. 16/55* . Washington: IMF.
IMF. (2016). *Regional Economic Outlook: Caucasus and Central Asia (October).* Washington DC: MCD, International Monetary Fund.
IMF. (2017, May 26). *IMF Press Release: IMF Staff Concludes 2017 Article IV Mission to Turkmenistan.* Retrieved from http://www.imf.org/en/News/Articles/2017/03/21/pr1791-turkmenistan-imf-staff-concludes-2017-article-iv-mission
McKinsey & Company. (2013). *Infrastructure productivity: How to save $1 trillion a year.* McKinsey Global Institute.
McKinsey&Company. (2016). *Bridging Global Infrastructure Gaps.* McKinsey Global Institute.
MID. (2017, May 26). *Ministry for Investment and Development of the Republic of Kazakhstan*. Retrieved from http://mid.gov.kz/en/news/kazakhstan-significantly-increased-transit-potential-due-creation-international-corridor

Nurbayev, D. (2017, May 27). *Eurasian Research Institute.* Retrieved from The Current State of the Sovereign Wealth Fund Samruk-Kazyna: http://eurasian-research.org/en/research/comments/economy/current-state-sovereign-wealth-fund-samruk-kazyna

OECD. (2007). *Infrastructure to 2030 (volume 2): Mapping Policy for Electricity, Water and Transport.* Organisation for Economic Co-operation and Development.

OECD/IEA. (2015). *Eastern Europe, Caucasus and Central Asia.* Paris: International Energy Agency.

pppknowledgelab. (2017, May 27). Retrieved from https://pppknowledgelab.org/countries

Ruddy M., et al. (2014). *An In-Depth Study of Broadband Infrastructure in North and Central Asia.* Bangkok: United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).

Simsek, H. A. (2017, May 27). *Eurasian Research Institute, Kazakhstan.* Retrieved from Weekly Bulletin (01.03.2016-07.03.2016 No: 57) A Brief Look at the Fiscal Management of teh Economy of Turkmenistan: http://www.ayu.edu.tr/static/aae_haftalik/aae_bulten_en_57.pdf

Sommer, M. e. (2016). *Learning to Live with Cheaper Oil: Policy Adjustment in Oil-Exporting Countries of the Middle East and Central Asia.* Wahington: IMF, Middle East and Central Asia Department.

UNDP. (2016). *Asia-Pacific Human Development Report - Shaping the Future: How Changing Demographics can power Human Development.* New York: United Nations Development Programme.

UNDP. (2016). *Regional Human Development Report 2016 - Progress at Risk: Inequalities and Human Development in Eastern Europe, Turkey, and Central Asia.* Istanbul: United Nations Development Programme.

UNICEF & WHO. (2015). *Progress on sanitation and drinking water – 2015 update and MDG assessment.* Geneva: UNICEF and World Health Organization.

WB. (2016). *Russian Federation: Systematic Gountry Diagnostic: Pathways to Inclusive Growth.* World Bank.

WB. (2016). *World Development Report 2016: Digital Dividends.* Washington DC: World Bank.

WB. (2017, May 27). Retrieved from The World Bank in Uzbekistan: Country Snapshot: http://pubdocs.worldbank.org/en/318321475745550723/Uzbekistan-Snapshot-Oct2016FINAL.pdf

WB. (2017). *Banchmarking Public Procurement -2017: Assessing Public Procurement Regulatory Systems in 180 Economies.* Washington DC: World Bank.