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**ARE PUBLIC-PRIVATE PARTNERSHIPS
A SOLUTION TO THE INFRASTRUCTURE
BACKWARDNESS OF TAJIKISTAN?**

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Abstract

This paper discusses two high-profile public–private partnership projects in Tajikistan—the Dushanbe–Chanak motor toll road and Pamir Energy hydropower projects. An impact evaluation exercise was conducted for the Dushanbe–Chanak road using difference-in-difference estimates. The impact of the road on gross regional product, regional budget revenues and expenditures, and retail trade is estimated. Data were collected for the period 2000–2017 from the Regions of Tajikistan Statistical Bulletin compiled by the Statistics Agency of the Republic of Tajikistan. The results show that the treatment regions' (Sughd and DRS regions) gross regional product increased by 26% compared to the control regions (Khatlon and GBAO). The positive impact of the Dushanbe–Chanak toll road on regional budget revenues and expenditures is even larger, ranging from 29% to 42%. The quantitative impact analysis shows that the Dushanbe–Chanak toll road has had a positive impact on local economies overall, but relatively high toll charges in the absence of a free alternative road may have prevented greater economic impact on the most vulnerable groups of the population.

Keywords: public–private partnership, infrastructure finance, road, energy

JEL Classification: H54, L32, R42, R52

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1. INTRODUCTION

Public–private partnerships (PPPs) may be an effective tool for the delivery of infrastructure and infrastructure-based services. PPPs have been especially successful in power, water and wastewater, and transport sectors. They have allowed poor countries to build and maintain infrastructure they could otherwise not have afforded. Most of the PPPs have charged user fees to recover the initial capital investments. However, relatively high user fees in many countries have fueled concerns that they exclude large groups of the population (especially those with low incomes) from accessing the services.

The case of public–private partnership projects in the infrastructure development of Tajikistan is interesting – it was the first central Asian country to adopt the PPP modality to finance infrastructure development. Two high-profile examples of such collaboration between public and private sectors are the Pamir Private Power project in eastern Tajikistan and the Dushanbe-Chanak toll road that links the capital of the country and Khujand, the second-largest city in the north close to the Uzbekistan border. These infrastructure PPP projects differ in their approach to risk-taking and provide interesting cases for studying the feasibility of PPPs in poor countries.

As its external debt has grown over time, Tajikistan has become increasingly constrained in external borrowing. In these circumstances, PPPs can potentially become an important source of private investment, particularly into high-cost infrastructure projects. This study will look at a range of issues affecting PPPs and their implementation in Tajikistan.

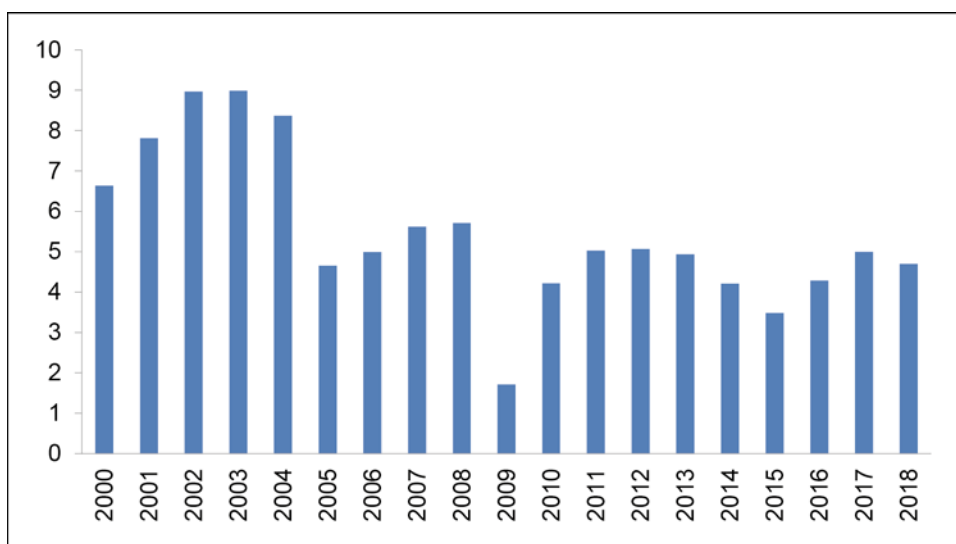
The empirical part of this paper conducts the impact assessment study of the Dushanbe-Chanak motor toll road on gross regional product, regional budget revenues and budget expenditures, as well as retail trade. In doing so, we compare project regions with other regions. Data were collected for the period 2000–2017 from the Regions of Tajikistan Statistical Bulletin compiled by the Statistics Agency of the Republic of Tajikistan.

2. ENABLING ENVIRONMENT FOR PPP IN TAJIKISTAN

2.1 Current Macroeconomic Trends

Tajikistan has been demonstrating relatively high economic growth rates despite the regional crisis of 2015–2016 and the domestic banking crisis that started in 2016. Per capita GDP growth rates have fluctuated between 4% and 5% since 2010, immediately after the global financial and economic crisis (Figure 1). Between 2007 and 2018, the Tajik economy grew at average growth rate of 6.75%. Before the Covid-19 pandemic, there were signs that the Tajik economy is trying to pick up a higher growth trajectory: in 2018 and 2019 the growth rate accelerated to 7.5%. The high rates of growth in recent years were primarily driven by the high volume of investments in the power and construction sectors, the production of metals and chemicals, and the textile and garment industry. High investments and government expenditures have significantly contributed to industrial production growth in recent years.

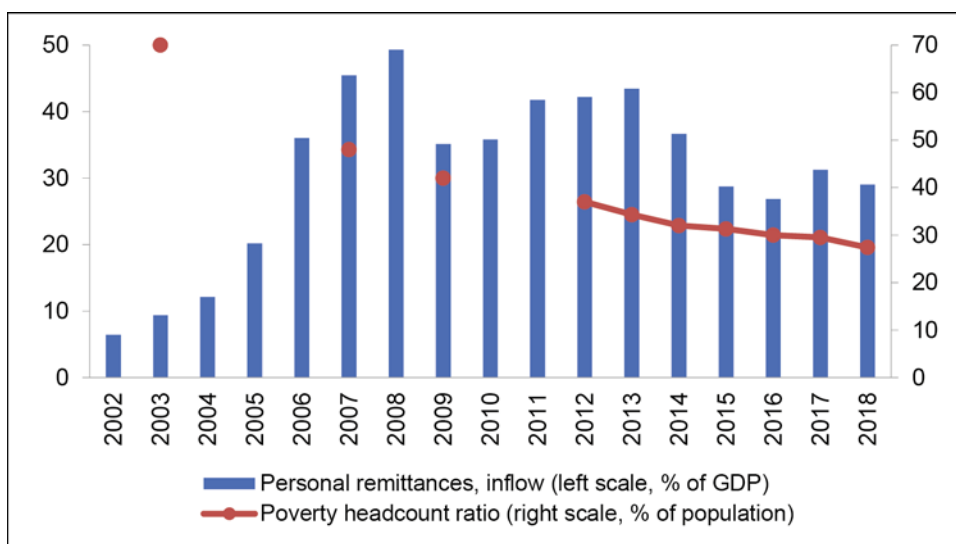
Figure 1: GDP per Capita Growth (annual %)



Source: World Bank’s World Development Indicators database 2020.

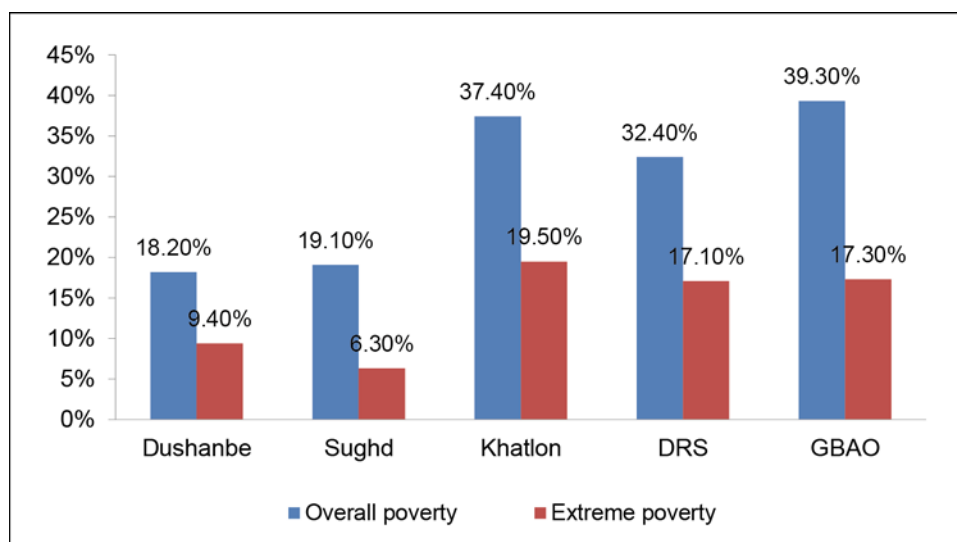
After a steep decline in 2014–2016 due to the regional crisis, remittances rebounded in 2017–2018, but remained below the pre-crisis levels. The estimated US dollar value of remittances to Tajikistan fell from nearly 50% of GDP in 2008 to about 27% in 2016, before increasing to 31% in 2017. Despite the decline, remittances have perhaps been the single most important factor behind the fall in the national poverty rate from around 70% in 2003 to 31% in 2017 (Figure 2). The remittances have been a boon for the overall increase in GDP and growth in incomes.

Figure 2: Inflow of Remittances and National Poverty Rate in Tajikistan



Source: World Bank’s World Development Indicators database 2020.

Along with the national poverty rate, regional poverty rates have fallen significantly over the last decade, but regional disparities remain high. The highest poverty rate is in GBAO, but Khatlon has the highest extreme poverty rate.

Figure 3: Overall and Extreme Poverty by Region in 2017, %

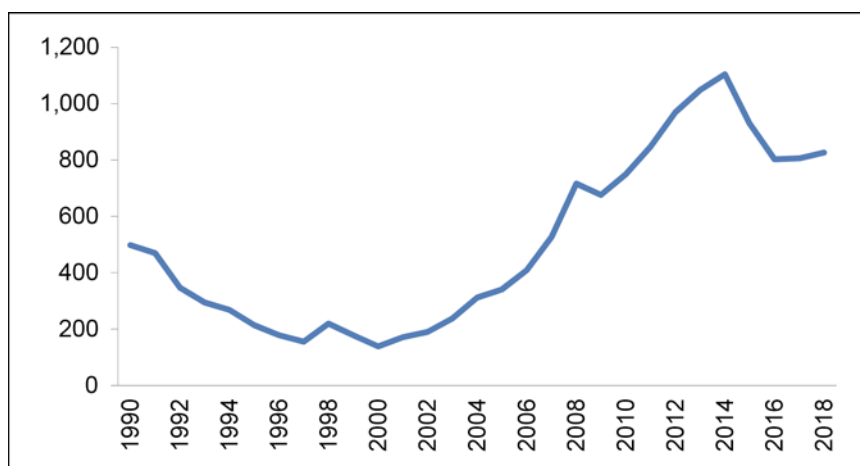
Source: TajStat and World Bank staff calculations.

As well as their role in poverty reduction, remittances helped Tajikistan keep inflation under control and finance its large deficit in the trade of goods and services. An increase in the volume of remittances has also mitigated the banking crisis in recent years. The Government of Tajikistan has bailed out two large commercial banks by extending emergency loans and capitalizing them. As a result, the budget deficit ballooned to 9.8% of GDP in 2016, but stabilized at around 2.4% of GDP in 2017. Public and publicly guaranteed debt increased from 42% of GDP in 2016 to about 50% of GDP by the end of 2017.

The trouble in the banking sector affected the exchange rate of the national currency – the somoni. It has depreciated by 43% since late 2016. The depreciation of the somoni has contributed to a significant increase in the non-performing loans (NPLs) as a share of the total volume of loans in the banking system from less than 20% in 2016 to more than 32% as of the end of June 2018.

2.2 Investment Climate

In recent years, Tajikistan has experienced a solid economic growth at a rate of 7%–8%, overcoming a sharp decline in 2014, which was caused by the fall in remittances and international commodity prices. High economic growth rates and inflow of remittances since 2000 have increased GDP and reduced the poverty rate. As a result of the uninterrupted economic growth since 2000, per capita GDP (in nominal terms) increased eightfold between 2000 and 2014, but the regional economic crisis and devaluation of the somoni has reduced GDP per capita to the level of \$800 (Figure 4), the lowest among the former Soviet Union countries.

Figure 4: Nominal GDP Per Capita in USD

Source: World Bank's World Development Indicators database 2020.

The Government of Tajikistan understands the importance of a business enabling environment and private sector-led growth for creating quality jobs. The reform agenda of the government emphasizes maintaining macroeconomic stability and enhancing private investments. The government's policies have been successful in bringing down consumer inflation from nearly 40% in 2001 to 7.3% in 2017.¹

However, according to UNCTAD (2016), the Tajikistan economy is characterized by low competitiveness and limited private sector development. The country is vulnerable to external shocks due to its heavy reliance on aluminum, cotton, and remittances. IMF (2015) notes that high budget deficits and a chronic savings–investment gap have increased the country's dependence on external sources of finance (i.e., official development assistance, loans, and remittances). In late 2016, the Tajik government had to bail out some of the country's largest banks by injecting almost \$500 million to prevent a full-scale financial crisis and run on domestic banks.

The Government of Tajikistan has focused heavily on energy security since Uzbekistan ceased supplying natural gas in 2008. The absence of natural gas has forced the population to use electricity for heating, which has resulted in a surge in demand for electricity. High population growth rates (the population increased 1.72 times between 1990 and 2018) have put additional pressure on utilities, including the power sector. Obsolete generation, transmission, and distribution power grids have meant that the power sector has not been able to meet the surge in demand.

Under these circumstances, the Government of Tajikistan has pursued construction of the Rogun Dam, which will be the world's tallest dam when construction is complete, as a project aimed at achieving energy security and exporting excess electricity to earn hard currency. The high price tag (in the region of \$4 billion) has not deterred the Government of Tajikistan from pursuing this project, which is financed mainly by the state budget.

In 2016, the government adopted a 2016–2030 National Development Strategy (NDS) and a 2016–2020 Midterm Economic Development Strategy. These strategies foresee high government and private investments in infrastructure. According to World Bank Group (2018), the NDS envisages \$118 billion for full implementation over 15 years, amounting to 16.5 times the current GDP and 54.5 times current gross investments.

¹ <https://knoema.com/atlas/Tajikistan/Inflation-rate>.

The financing of NDS goals is presumed to come from three sources: Out of a total of \$118 billion, \$54.7 billion should come from the private sector, while an almost equal amount (\$56.1 billion) will come from the budget. About \$7.3 billion (6.2%) are envisaged to be financed by international development partners.

Investments in infrastructure projects in the hydropower industry are considered to be the centerpiece of the development strategy. The construction of the 3,600 MW Rogun Hydropower Plant (“HPP”) at a cost of \$4 billion is expected to boost production and exports of electricity. To finance the Rogun project, the Government of Tajikistan raised \$500 million in 2017 in its inaugural ten-year international Eurobonds, at an annual interest rate of 7.125%.

In recent years, Tajikistan has improved its standing in most of the worldwide economic and infrastructure ratings. Table 1 shows Tajikistan’s recent performance in global economic/investment rankings – 122nd place among 180 countries on the Heritage Foundation’s Economic Freedom Index, 104th place out of 141 countries on the Global Competitiveness Index of the World Economic Forum, and 100th place out of 129 countries on the Global Innovation Index. Tajikistan also lags behind in rankings such as Transparency International’s Corruption Perceptions Index (153rd place out of 180 countries) and the World Bank’s Doing Business survey (106th place among 190 countries).

Table 1: Tajikistan’s Recent Performance in Global Rankings

Measure	Year	Index/Rank	Source
Transparency International’s Corruption Perceptions Index	2018	153/180	http://www.transparency.org/country/TJK
World Bank’s Doing Business Report “Ease of Doing Business”	2019	106/190	doingbusiness.org/rankings
Global Innovation Index	2019	100/129	https://www.globalinnovationindex.org/analysis-indicator
Index of Economic Freedom	2018	122/180	https://www.heritage.org/index/ranking
Global Competitiveness Index	2019	104/141	https://www.weforum.org/reports/global-competitiveness-report-2019

Tajikistan has also relied heavily on soft loans and foreign direct investments from larger regional neighbors, including the People’s Republic of China (PRC), the Russian Federation, and Iran. In the last decade, the PRC has been Tajikistan’s largest investor and third-largest trading partner, with investments totaling \$2.25 billion. Tajikistan has also borrowed heavily from the PRC – the country’s external debt to the PRC reached \$1.2 billion (41.3% of all external debt) in 2018.

2.3 Infrastructure Needs in Tajikistan

Power Sector

The transport and energy infrastructure of the country traditionally linked Tajikistan with other Soviet Union republics, but this northern orientation has become one of the major bottlenecks in the development of the country. The geographical backwardness of the country was exacerbated by difficult relationships with neighboring countries, most significantly with Uzbekistan. The Soviet infrastructure made Tajikistan dependent on Uzbekistan since natural gas pipelines, transit roads, railways, and electricity grids run across Uzbek territory. For more than two decades starting from 1996, Uzbekistan

closed most of the border checkpoints, mined the border areas, and introduced a visa regime for Tajik citizens.

The country relies heavily on hydropower for electricity, the primary source for industrial as well as household energy. The electricity supply is hampered by frequent blackouts, especially in winter months. Businesses face frequent outages, incurring economic losses. The severe winter of 2017–2008 crippled the whole country and brought the power generation, transmission, and distribution system to breaking point.

If Tajikistan's state-owned energy company, Barqi Tojik, dominates the production of power, its mammoth aluminum factory, TALCO, consumes about 30% of the electricity produced in the country and more than 40% of the electricity produced by Barqi Tojik.² TALCO accounts for more than 30% of GDP and 40% of the country's exports. The aluminum plant receives a special electricity tariff rate of \$0.01 per kWh, though the tariffs for TALCO are slated to increase by 15% in summer months (from April to September) and by 300% in winter months (from October to March). With this increase, TALCO will retain subsidized tariff rates in summer, but has to pay rates closer to the cost-recovery levels in winter months, estimated to be around \$0.03 per kWh. Agriculture uses about 30% of Tajikistan's electricity consumption mainly through the use of electric water pumps, while industry consumes approximately the same amount, and residential houses consume the rest.

The power sector is also characterized by significant swings in demand (high demand in winter and low demand in summer) and peak hours, making it difficult for the state-owned power company, Barqi Tojik, to meet the demand. Due to the rapid deterioration of the generation facilities and transmission and distribution grids, the technical losses are thought to be in double-digit figures.

In addition, Barqi Tojik is in serious financial distress due to operational inefficiencies and high debt burden. According to the Ministry of Energy of Tajikistan, Barqi Tojik's outstanding debt, excluding loans taken out for the implementation of electric power projects, stood at 4 billion 145 million somoni (approximately \$450 million) as of July 2018, increasing by 450 million somoni (about \$50 million) in six months. Debts on loans for investment projects at the beginning of this year amounted to 11 billion somoni (\$1.2 billion).

Roads

In the last decade, Tajikistan has invested significant funds into rehabilitation of the main roads, such as Dushanbe-Chanak (Uzbekistan border), Dushanbe-Kulma (PRC border), and Kurgan-Tube-Nizhny Pyanj (Afghan border). Apart from these high-profile projects, the government has also undertaken construction of tunnels and bridges in other parts of the country. The PRC has emerged as a major source of funding for road infrastructure rehabilitation with approximately \$720 million since 2007.

Despite these efforts, road connectivity within the country remains poor and inadequate. Improving relations with Uzbekistan are expected to boost Tajikistan's trade with Uzbekistan and the rest of the world. However, if the road networks cannot cope with the increasing traffic volumes and loads, the country will not reap the full extent of benefits from opening up. Another important aspect of the road transportation is the deterioration of road safety and the increase in the number of traffic accidents.

² ADB Access to Green Finance Project (RRP TAJ 45229), Supplementary Document 16 "Private Sector Development Roadmap," accessed 5 November 2018 at: <https://www.adb.org/sites/default/files/linked-documents/45229-001-taj-oth-03.pdf>.

In June 2018, the Ministry of Transport of Tajikistan unveiled its ambitious plan to build and renovate about 30 road projects, the implementation of which will require more than \$2.7 billion. The most expensive project on the list of promising road projects is the project “Rehabilitation of Khorog-Kulma section of Dushanbe-Kulma highway.” According to preliminary data, it will cost about \$568 million to rehabilitate the 395-kilometer section of this highway.³

Railway and air transport services in Tajikistan are relatively underdeveloped. These sectors are characterized by a high level of monopolization and high costs. Due to the political tensions with Uzbekistan, transit fees for railway transport have been high.

Overall, Tajikistan’s air transport system is expensive and inefficient due to limited competition, and has inadequate coverage, with very few major international airlines flying in and out of the country, except for Turkish Airlines and Russian Airlines.

In 2017, the World Bank’s Logistics Performance Index estimated the quality of trade and transport-related infrastructure in Tajikistan to be 2.1 (on a scale of 1 to 5, where 1 = lowest and 5 = highest), an extremely low ranking. The World Economic Forum’s Global Competitiveness Index assigns Tajikistan 3.3 points (out of 7) on the overall quality of infrastructure. These estimates indicate that Tajikistan’s infrastructure backwardness may be acting as a serious impediment to the country’s aspirations to become a prosperous country.

2.4 PPP Legislation

The legislation and regulations of Tajikistan in the sphere of public–private partnerships (PPPs) include:

- Civil Code
- Tax Code
- Customs Code
- Land Code
- Law “On Investments”
- Law “On State Procurement of Goods, Works, and Services”
- Law “On Agreements on Production Sharing”
- Law “On Concessions”
- Law “On Public–Private Partnerships”

National legislation regulating PPPs in Tajikistan consists of many codes and laws, but the most important laws are the Law “On Concessions” and the Law “On Public–Private Partnerships.” Tajikistan adopted its first Concession Law in 1997, which served as the statutory basis for some PPPs, including the Dushanbe-Chanak toll road. The Law on Concessions regulates relations between participants of the concession, defines the rights and obligations of the authorized state agency, the rights and obligations of the concessionaire, and other issues. In particular, the Law allows the transfer of state objects into concession without tender in exceptional cases.

³ <https://en.trend.az/casia/tajikistan/2915835.html>.

However, according to EBRD (2008), the Law fell far short of international best practice. In particular, the assessment found Tajikistan is in “very low compliance” with international standards such as the UNCITRAL Legislative Guide on Privately Financed Infrastructure Projects.

The EBRD (2008) assessment revealed that the Law is vague and major clauses are declarative in nature. EBRD (2008) recommended undertaking major legislative reforms to create a solid legal basis for the development of PPPs in Tajikistan.

The legal framework was improved with the introduction of Law No. 907 on Public–Private Partnerships, dated 28 December 2012 (hereinafter the “PPP Law”). According to Article 6 of the PPP Law, the PPP Unit is entrusted to make recommendations to the Public–Private Partnership Council on which projects to pursue or approve, what issues within the PPP program warrant further examination, etc. The PPP law also stipulated the creation of a PPP Unit under the State Committee on Investments and State Property Management. In August 2013, the PPP Unit was established.

The PPP Law specifies the following types of projects to be implemented under PPP agreement:

- infrastructure projects – design, construction, development, and use of a new infrastructure facility or reconstruction, modernization, extension, and operation of any existing infrastructure facility;
- social services project – design, development, and operation of any structure operating under the jurisdiction of the state partner prior to the start of the project that directly or indirectly provides social services to the population for a period of not less than three years (domestic, psychological, medical, educational, and other services).

The PPP Law assigns the following state authorities as authorities regulating the PPP activity:

- Government of the Republic of Tajikistan
- Public–Private Partnership Council (hereinafter “the Council”)
- State Committee on Investment and State Property Management of the Republic of Tajikistan

The PPP Law assigns a leading role to a contracting authority (state authority) in reconciliation of a PPP project. The contracting authority prepares a feasibility study of the PPP project (independently or through engaging specialized organizations), develops tender documentation, and participates in negotiation and the preparation of a PPP agreement.

The PPP Law lays out the basic requirements for type, content, and implementation procedure of any PPP agreement. It also allows the introduction of additional conditions to a PPP agreement within certain PPP projects. The Law establishes grounds and terms for termination of a PPP agreement by the contracting authority and private partner, as well as by mutual consent of the parties involved.

The PPP Law stipulates certain restrictions with respect to PPP projects. In particular, the Law shall not apply to:

- goods procurement, work performance, and service rendering in accordance with the Law of RT “On state procurement of goods, works, and services”
- privatization and denationalization of state property and enterprises in accordance with the Law “On privatization of state property of the Republic of Tajikistan”
- granting rights for subsoil use according to the Law of RT “On subsoil use” and “On concessions”

The decision to keep the Law “On concessions” despite adoption of the more progressive PPP Law creates an unnecessary legal dilemma – whether to go along with the more rigorous PPP Law or use shallow stipulations of the Law on Concessions as a basis of the PPP agreement.

Article 22 of the PPP Law defines the circumstances under which the government can grant PPP projects without a competitive procurement process. These include: an urgent need to ensure delivery of a public service; if the project deals with matters of national defense and public security; when only one source can provide the required service, including services of intellectual property and trade secrets; cases in which no bidders meet the evaluation criteria in the preliminary selection stage and fail; and other cases when national, public, and local governmental interests arise. UNECE (2013) expressed concerns regarding this provision of the law and stated that it can provide a long list of cases of nontransparent contractual operations, where the provisions of the PPP Law do not apply.

2.5 Institutional Framework for PPP

The PPP Law created the current organizational and institutional framework that will be considered below. Though the PPP Law provides a basis for the modern institutional framework, it lacks certain important elements. One of the provisions missing in the modern PPP legislation is international arbitration in dispute settlement. Any disputes, if not resolved amicably between public and private partners, will be referred to the PPP Council, consisting of senior Tajik government officials. This dispute settlement model will probably provide a little assurance to the investors that potential disputes with the public partner will be resolved objectively.

The PPP Law created two layers of decision-making, the PPP Unit and the PPP Council, instead of one single decision-making PPP Unit as in many other countries. This additional layer of bureaucracy may delay decision-making and the implementation of PPP projects.

Another issue is the placement of the PPP Unit under the State Committee on Investment and State Property Management. In terms of granting necessary authority, many countries have placed PPP Units within either the Ministry of Economic Development or the Ministry of Finance. In most cases, establishment of PPP Units inside the Ministry of Finance enables countries to better integrate the PPP program with the state budget.

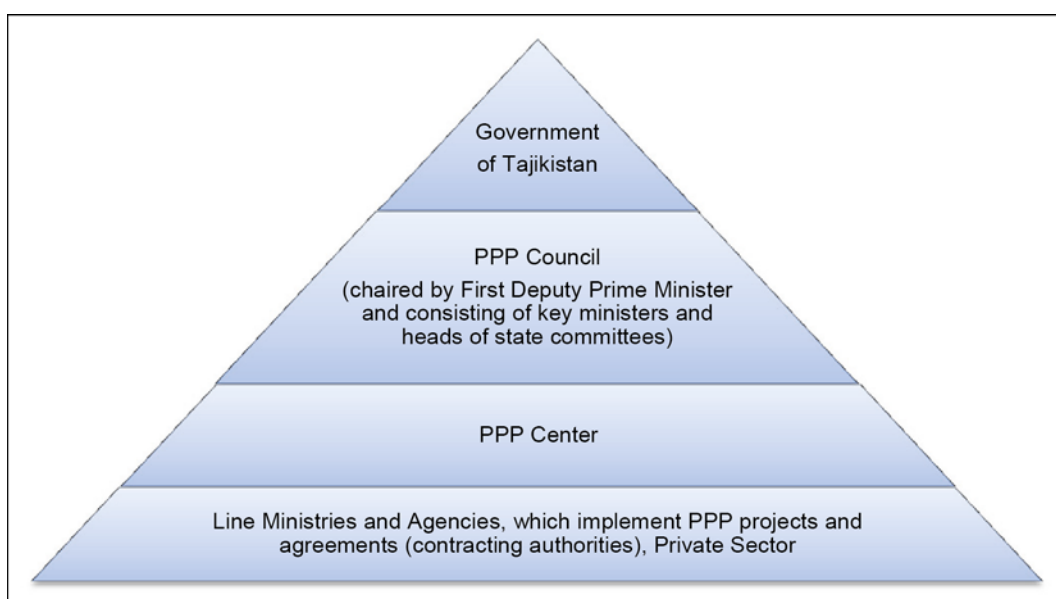
According to the PPP Law, the PPP Council is designated as a key decision-making organ in the PPP process. It is authorized to supervise the activities of all ministries and local governments related to the development and implementation of PPP projects. Every single act in the PPP cycle has to be conducted with the approval of the Council.

The Council is chaired by the first Deputy Prime Minister, and the chairman of the State Committee on Investments and State Property Management is the deputy chairman of the Council. The members of the Council are the ministers of justice, finance, economic development, and trade, and the heads of the State Committee on Land and Geodesy and the Agency on Construction and Architecture. The Council holds a session every three months upon receiving project proposals.

The second supervising organ in the PPP field is the PPP Center under the State Committee on Investments and State Property Management of Tajikistan. The PPP Center is responsible for implementing state policy in the PPP field, preparing guidelines and standards for PPP projects, assisting public authorities in preparing PPP projects, conducting training and workshops for public and private partners, and consulting them in preparing feasibility study reports and reviewing preliminary initial project proposals and feasibility study reports. The Center also plays the role of secretary of the Council. It organizes the Council session and reviews the proposed projects, submits them to the Council, and makes recommendations for their improvement. To build the capacity of the Center, ADB provided technical assistance. Within three years of the TA project implementation (2013–2016), international specialists assisted the Center in developing methodological tools and guidelines for preparing PPP projects, and conducting training, workshops, and educational activities for government authorities, private partners, local entrepreneurs, and the public.

To coordinate the activities of the government authorities in the PPP field, the focal points are identified in each ministry, committee, agency, and local government. The focal points prepare PPP projects in their relevant sector and propose them to the PPP Center for review and further submission to the Council. Additionally, a commission for evaluating bidding proposals for PPP projects is established, comprising representatives of relevant government authorities. The commission organizes the bidding process, evaluates bidders, decides on the winner of the bid, and submits the result of the bidding process to the PPP Council for approval.

Figure 5: Institutional Structure of PPPs in Tajikistan



Source: Law on PPP (2012) and Guidelines for the preparation and implementation of PPP projects in Tajikistan (2014).

3. CASE STUDIES

3.1 Case Study 1 – Pamir Energy Project in Eastern Tajikistan

The main goal of the Pamir Energy project was to restore a reliable electricity supply to the geographically isolated inhabitants of eastern Tajikistan. Under the former Soviet Union, 60% of Tajikistan's energy was provided by diesel-generated machinery running on imported fuel. After the collapse of the Soviet Union, power failures became widespread. The project was supposed to contribute to Tajikistan's poverty reduction strategy by providing electricity to businesses and citizens.

Financing

The PPP agreement stipulates that the government remains the principal owner of all physical assets, while Pamir Private Power is responsible for all electricity generation, transmission, and distribution facilities through a special purpose vehicle company. The concessions agreement between the Government of Tajikistan and the Aga Khan Fund for Economic Development (AKFED) was signed in May 2002 for 25 years. The initial cost of the project was \$26 million.

In order not to burden the company with a high level of debt, a consortium of international organizations developed a financing mix with 45% in equity finance and 55% debt, which was provided by the International Finance Corporation (IFC) and the International Development Association (IDA). The IFC provided \$3.5 million in equity financing; the remainder, \$8.2 million, was provided by the Aga Khan Fund for Economic Development (AKFED), the private sector partner in the venture.

Social Protection

The project had important social aspects since GBAO is the poorest region in Tajikistan. Some 98% of electricity in GBAO is consumed by households, and only 2% is consumed by businesses. In these circumstances, charging the full cost-recovery level of tariffs could potentially be burdensome for the most vulnerable population. Therefore, the Government of Tajikistan, supported by a Swiss Government Grant in the amount of \$4 million, decided to subsidize the cost of electricity for the most vulnerable. For this purpose, a special trust fund was established.

The trust fund subsidized the so-called "social tariff rate," which was designed to grow over the next decade. That was thought to decrease the cost of electricity without harming the bottom line of Pamir Energy. The scheme was later amended so that it lasted more than 10 years it was initially designed for. This social protection scheme shows that it is possible to design a program so that it has strong social protection aspects to it.

Structuring the Project

Pamir Energy and the Government of Tajikistan concluded a concession agreement for 25 years. The agreement detailed policy, regulatory, operational, and financial aspects of service provision. The IFC played a key role in drafting the agreement.

However, the need to renegotiate the agreement became clear in the first years of the project. Pamir Energy was initially responsible for power generation only, and Barqi Tojik was responsible for the distribution and collection of user fees. But due to the difficult financial situation of the state power company, the rate of collection remained low, in the region of 70%. In addition, it became clear that without simultaneous

investment into transmission and distribution systems it is impossible to decrease the technical losses, which could reach up to 30%.

The government established a high-level working group including senior representatives from all relevant ministries and agencies to discuss and renegotiate the Concession Agreement. Two key changes were introduced: The structure of the deal was changed so that Pamir Energy became the sole operator of transmission and distribution grids. The second change that was made concerned the social protection scheme – international donors agreed to enlarge the scheme to cover a greater share of the population and mobilized additional funding to finance the social protection program.

Successful Risk Mitigation

The project assessed and mitigated emerging risks well. The IFC and IDA not only provided equity, but also the necessary regulatory, technical, and legal framework. Also, emerging risks were shared between the public and private partners.

Private Sector Added Value

This project has shown that even in a relatively high-risk environment as in Tajikistan, successful private investments can bring necessary changes to people's lives. However, the biggest challenge for Pamir Energy is to remain financially viable. For a small power company like Pamir Energy, it is difficult to remain profitable and generate sufficient funds to invest. In the case of Pamir Energy, the key to the financial viability of the project was to charge much higher cost-recovery tariffs for electricity than in the rest of Tajikistan. The mix of financing (with equity, loan, and grant components) served the project well in the long run.

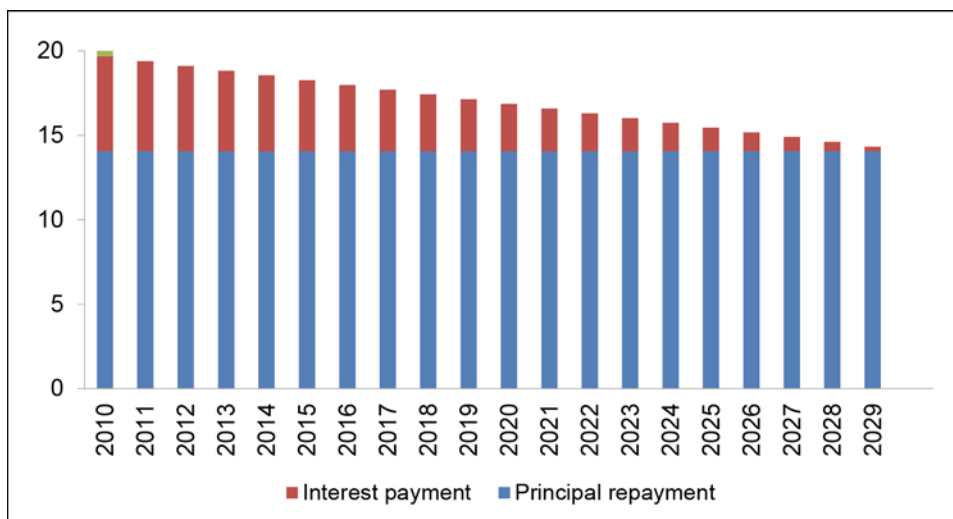
3.2 Case Study 2 – the Dushanbe-Chanak Toll Road

Tajikistan has invested approximately \$296 million into the improvement of the road between Dushanbe and Khujand. A total of \$281 million came from the PRC in the form of a 20-year concessional loan at a 2% interest rate. The construction was entrusted to Chinese road construction and tunneling companies. The constructors reconstructed an old mountain pass but had to enlarge the road and rebuild 39 bridges and three large tunnels. The overall length of the road was 354 km.

Figure 6 shows the repayment schedule of the PRC's loan assuming the reported 2% interest rate. It shows that at the beginning of the 20-year period the payment of interest and repayment of principal constitute almost \$20 million, but this gradually declines over time to around \$14 million by 2029.

Upon the completion of the road renovation in early 2010, the Government of Tajikistan awarded the rights to manage the Dushanbe-Chanak (Sughd) toll road to a private sector company, Innovative Road Solutions (IRS) (registered in the British Virgin Islands and reportedly established by Tajik citizens). The Government of Tajikistan signed a concession agreement with IRS for 30 years, where the company was granted the right to equip the road with toll plazas and collect tolls from motorists. The company was also exempted from all taxes except social payments. The agreement between the government and the company was never made public. One of the reasons why it was not made public is that the awarding was done without any tendering process.

Figure 6: Interest and Principal Repayment Schedule for the PRC Loan for the Reconstruction of the Dushanbe-Chanak Road



The preparation for converting the Dushanbe-Chanak road to a toll road started in 2009, when Tajikistan’s parliament amended the country’s law on transport to allow toll roads even without alternative or bypass roads. The newly introduced Article 38 of the Law “On Transportation” stipulates that the toll roads might be organized to improve the service provision to users of the roads, and to accelerate the development of the road network by attracting additional investments. The toll rates should be set by the Government of Tajikistan.

The Dushanbe-Chanak toll road was opened on 1 April 2010. The toll rates established at the beginning were in the region of 4 US cents per km for passenger cars and as high as \$4 per km for heavy-duty trucks. The rates meant that to travel from Khujand to Dushanbe, cars had to pay roughly \$11. The toll for trucks could reach \$100. Over the years, the rates in US dollars have fallen due to the faster devaluation of the somoni, and in February 2020 traveling the same distance cost about \$7 for cars, which roughly translates into approximately 2 US cents per km.

3.3 Comparative Analysis of the Two PPP Projects in Tajikistan

The OECD Principles for Public Governance of Public–Private Partnerships provide guidance for policymakers on how to make sure that public–private partnerships (PPPs) represent value for money for the public sector. They provide guidance on when a PPP is relevant – e.g., not for projects with rapidly changing technology such as IT, but possibly for well-known generic technology such as roads.

In this section, the two PPP projects are compared using the OECD Principles for Public Governance of Public–Private Partnerships (2011). The OECD Principles are intended to help policymakers evaluate and improve the legal, regulatory, and institutional framework for managing PPP projects, with a view to supporting economic efficiency, sustainable growth, and financial stability.

On the basis of the OECD Principles, different tools have been developed to assess the quality of the corporate governance in specific circumstances. One of the tools – a checklist – has proved to be particularly applicable to PPP projects. Below we use the checklist to assess each PPP project’s adherence to the principles of transparency, stakeholder consultations, and accountability.

Table 2: Comparative Analysis of the Pamir Energy and Dushanbe-Chanak Road Projects

PPP Principles and Checklist Questions	Pamir Energy	Dushanbe-Chanak Toll Highway
Are there coherent PPP policies that lay down clear objectives and principles, identify projects, set realistic targets and the means of achieving them, with the overall aim of winning the support of the population for the PPP approach?	√ Partly. The Pamir Energy project was initiated based on the Law “On Concessions” (1997). The Law has been found by EBRD to be in “very low compliance” with international standards. Though it was based on the flawed legislative framework, the project has clearly defined goals and targets. It has paid particular attention to winning the support of the population for the project by performing public consultations.	√ No. The project is also based on the Law “On Concessions”, which allows temporary transfer of state assets into private concession without tender in exceptional cases. The project faced resistance and protestations from the local population, especially in Varzob district near Dushanbe. Proper public consultations have not been conducted.
Is the government building its capacities, including skills, establishing new institutions and training public officials, and using external expertise?	√ Yes. The state-owned Barqi Tojik is teaming up with Pamir Energy to implement the project.	√ Partly. The Ministry of Transportation, though it generally oversees the Dushanbe-Chanak toll road, is not closely involved in the management of the road.
Is risk transferred to the private sector? Does the government accept its share and help to mitigate those risks allocated to the private sector?	√ Yes. The majority of the risk is transferred to the private company by transferring state assets and letting the private company structure the finance and management modalities.	X No. The loan from the Government of the PRC to renovate the road is not transferred to the private company. It is not clear who (government or private company) bears the burden of repaying the loan.
Does a clear and efficient legal framework to regulate conditions of property, the taxation framework and the treatment of potential conflicts of interests exist?	√ Partly. The concession agreement between Pamir Energy and the government clearly stipulates rights and obligations of the parties with regards to property, as well as taxation.	X No. The agreement between the government and the private company reportedly exempts the company from all taxes except employment social contributions. Other provisions of the agreement are not publicly known.
Does the PPP process put people first by increasing accountability and transparency in projects and improving the quality of life, especially of the socially and economically disadvantaged?	√ Yes. The Pamir Energy project has a strong social dimension by providing uninterrupted electricity to the region and subsidizing its cost for the most disadvantaged groups of the population.	√ Partly. The project provides reliable transportation to link one of the major regions with the capital of the country. It also provides reduced tariffs (by 50%) for local travel.
Does the PPP process reflect environmental considerations in the objectives of the project?	√ Yes. By replacing the diesel power stations with clean hydropower electricity, the project is contributing positively to the environmental goals.	√ Partly. The project maintains the quality of the road by decreasing the travel time spent and saving fuel per km traveled. However, environmental considerations are not one of the major goals of the project.
Is the selection of the bidder undertaken following a transparent, neutral, and nondiscriminatory process?	X No. The selection of the Aga Khan Fund for Economic Development (AKFED) as a private operator for the power generation and distribution is not done on a competitive basis. The contract is simply awarded to AKFED on the basis of political considerations.	X No. The contract to manage and maintain the 354 km Dushanbe-Chanak toll road was awarded to Innovative Road Solutions Ltd without any formal bidding process.

continued on next page

Table 2 *continued*

PPP Principles and Checklist Questions	Pamir Energy	Dushanbe-Chanak Toll Highway
Is an acceptable operational framework for the acceptance of risk-related responsibility by the public sector created?	√ Yes. The risks of the project and responsibility to mitigate/accept them are clearly defined.	X No. Risks associated with operational aspects of the project are not clearly defined and responsibility is not identified.
Does the PPP contract define the responsibilities of each party and the treatment of potential conflicts of interests?	√ Yes. The responsibilities of the parties are clearly defined in the concessions agreement. The clearly defined roles and responsibilities serve as a basis for avoiding conflicts of interest.	X Partly. The text of the contract between IRS and the Government of Tajikistan has not been made public, therefore it is not possible to assess whether the contract defines the roles and responsibilities of public and private partners. The biggest unknown is how the repayment of the Chinese loan is structured in the agreement.
Are new skills and competences acquired that help modernize the public sector within the context of PPP?	√ Yes. The principles of corporate governance and the project-based approach to management are useful for modernizing Barqi Tojik or for implementing new projects similar to the Pamir Energy project.	X Partly. The Ministry of Transportation has limited interaction with IRS and new skills and competences are not actively transmitted through the project. However, the government has plans to build new toll roads, and the Dushanbe-Chanak experience should be useful in managing them.

4. EMPIRICAL MODEL

4.1 Brief Review of Relevant Literature

Road infrastructure is thought to have a tangible impact on the livelihoods of households through a number of channels, such as improving people's mobility, providing access to remote markets, and stimulating economic activity along the roads. Almost 60 years ago, Rostow (1962) wrote about infrastructure and roads being catalyzers for economic development. De Vera Garcia (1984) considered roads to be important factors in the development of rural areas.

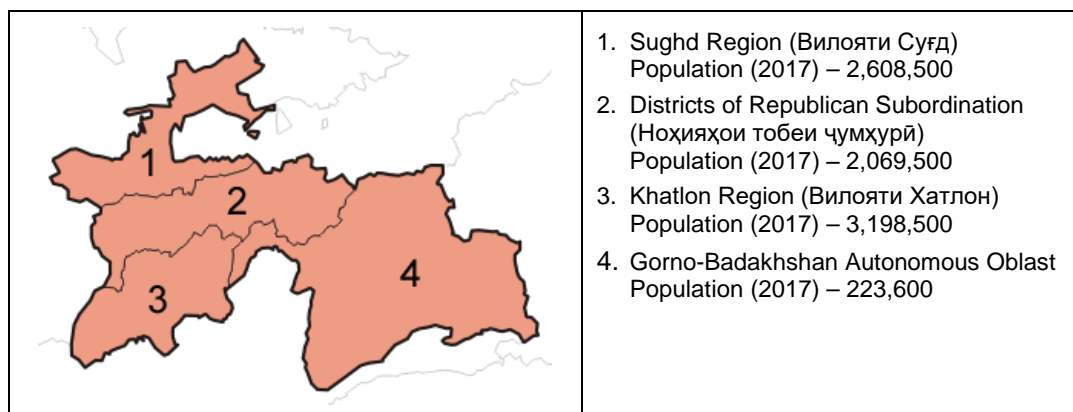
However, interest in evaluating the impact of infrastructure projects had started growing again by the end of the 20th, beginning of the 21st century. One of the earliest studies, Yoshino and Nakahigashi (2000), used a production function approach to examine the impact of infrastructure on productivity in Japan and found that the effect of social capital stock, which increases the potential productivity of the private sector, was high during the high economic growth period. In addition, they found that the productivity effect of infrastructure is greater in tertiary industries than in primary and secondary industries.

Other authors have found significant and positive relationships between road infrastructure and a reduction in poverty levels (Gibson and Rozelle 2003; Jalan and Ravallion 1998; van de Walle and Mu 2011), increased household income and consumption (Escobal and Ponce 2003; Jalan and Ravallion 2002; Khandker, Bakht, and Koolwal 2006), health and education (Lokshin and Yemtsov 2003; Stifel and Minten 2008), and improvements in water and sanitation facilities (Jalan and Ravallion 2003).

One of the most popular methods for estimating the impact of road infrastructure is the difference-in-difference method. This method proved its worth in establishing a cause-and-effect relationship and used observational data for deriving proper counterfactuals.

4.2 Data and Methodology

We collected a panel data set for four regions of Tajikistan – Sughd, Khatlon, Gorno-Badakhshan Autonomous Oblast (GBAO), and Districts of Republican Subordination (DRS).



No.	Name of the Region	Area (km ²)	Pop (2000)	Pop (2010) ^[1]	Pop (2019) ^[2]
1	Sughd Region	25,400	1,871,979	2,233,550	2,658,400
2	Districts of Republican Subordination	28,600	1,337,479	1,722,908	2,120,000
3	Khatlon Region	24,800	2,150,136	2,677,251	3,274,900
4	Gorno-Badakhshan Autonomous Oblast ¹	64,200	206,004	205,949	226,900
–	Dushanbe	124.6	561,895	724,844	846,400

[1] https://en.wikipedia.org/wiki/Regions_of_Tajikistan#cite_note-1.

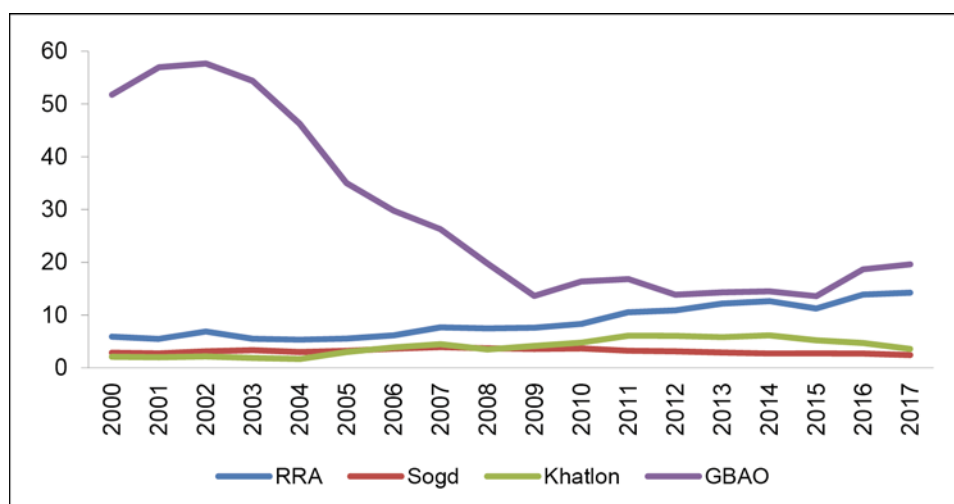
[2] https://en.wikipedia.org/wiki/Regions_of_Tajikistan#cite_note-2.

The information collected ranges from population to gross regional product, investments, number of employed and unemployed, and revenues and expenditures of local authorities. The data from 2000 to 2017 come from the Regions of Tajikistan Statistical Bulletin compiled by the Statistics Agency of the Republic of Tajikistan for various years. Descriptive statistics for all variables are provided in Table 2.

As can be seen from Table 1, Tajikistan's regions are characterized by large variations due to their size and varying dynamics. Throughout the period, the unemployment rate ranged from 58% in GBAO to 2% in the Khatlon region. Figure 7 below shows unemployment rate dynamics by region of Tajikistan. While the GBAO region achieved impressive gains in reducing unemployment from almost 60% to a more manageable under 20%, the fortunes of other regions were mixed. This shows how diverse the regions of Tajikistan are and how the same policies could have different effects on individual regions.

Table 2: Descriptive Statistics of Regional Data for Tajikistan

Variable	N	Mean	SD	Min	Max
Gross regional product, mln somoni	72	4,240	4,500	105	17,511
Investment, mln somoni	72	748	878	5	3,905
Number of employed people, '000	72	235	167	21	455
Number of unemployed people, '000	72	11	5	3	24
Unemployment rate, %	72	11	13	2	58
Population, '000	72	1,693	951	204	3,199
Incoming migration, people	72	5,181	3,948	193	14,651
Outgoing migration, people	72	7,790	4,748	862	21,334
Migration balance, people	72	-2,609	2,392	-7,469	2,299
Total revenue of local governments, mln somoni	72	295	348	11	1,608
Total expenditure of local governments, mln somoni	72	395	394	29	1,570
Education expenditure, mln somoni	72	216	210	13	823
Health expenditure, mln somoni	72	95	93	7	363
Share of industry in GRP	72	17	8	5	39
Share of agriculture in GRP	72	31	10	14	62
Share of services in GRP	72	38	7	13	56
Average nominal wage, somoni	72	313	299	10	1,013
Average nominal pension, somoni	72	115	101	3	337
Volume of retail trade, mln somoni	72	1,334	1,654	6	7,357

Figure 7: Unemployment Rate by Region of Tajikistan, 2000–2017

Source: Regions of Tajikistan statistical yearbook, various issues.

This paper utilizes a difference-in-difference (DiD) approach to evaluate the impact of the Dushanbe-Chanak motor road in Tajikistan. DiD measures pre- and post-intervention changes for treatment (with project) and comparison (no project) regions. This analysis assumes that changes in both treatment and comparison groups are driven by fundamental factors such as GDP, business cycles, and others, while changes in treatment regions are attributed to the impact of the Dushanbe-Chanak road.

The Dushanbe-Chanak road crosses and links two regions, Dushanbe and Khujand, and crosses DRS. These three regions constitute our treatment regions. The remaining two regions, Khatlon and GBAO, constitute our comparison groups.

Our model includes six dependent variables (gross regional product, total local budget revenues, total expenditures, education expenditures, health expenditures, and retail trade turnover by region), three independent variables (investment volume, population and employment). It also includes time- and region-specific dummies, a dummy for the Dushanbe-Chanak toll road (*after*) and a dummy for treatment regions (*treat*). The estimated econometric model is as follows:

$$Y_{it} = \beta_0 + \beta_1 Treat_i + \beta_2 Treat_i \times After_t + \beta_3 Z_i + \theta_i + \mu_t + \varepsilon_{it}$$

where

Y_{it} : dependent variables, such as regional GDP, local government revenues, and expenditures

$Treat_i$: dummy variable for the regions where the Dushanbe-Chanak toll road is located (Sughd and RRA regions)

$After_t$: dummy variable, equal to 1 for 2010–2017, when the Dushanbe-Chanak toll road has been operational, and zero otherwise

Z_i : regional-level control variables

θ_i : regional-level fixed effects

μ_t : time effects

We first calculate real values of monetary variables by dividing nominal variables by the GDP deflator and then take logs. By adding the interaction term of the *After* and *Treat* variables, we are able to estimate DiD estimation of the impact of the Dushanbe-Chanak toll road on the dependent variables.

4.3 Presentation and Interpretation of the Empirical Model

The results of DiD model estimations are presented in Table 3. The six dependent variables are: log of real gross regional product (1), log of real budget revenue of regions (2), log of real budget expenditures of regions (3), log of real education expenditures (4), log of real health expenditures (5), and log of real retail trade (6).

Table 3 shows that the models overall explain variations in the dependent variables well. Employment, time, and regional dummies are highly significant. However, investment and population variables are insignificant in the majority of the equations.

More interesting for us is that the interaction term $Treat \times After$, which captures the impact of the Dushanbe-Chanak motor road, is significant in all specifications. In the first five models, it has a positive sign, while in the last regression with real retail trade as a dependent variable it has a negative sign.

Table 3: Results of DiD Regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	Log of Real Gross Regional Product	Log of Real Budget Revenue of Regions	Log of Real Budget Expenditures of Regions	Log of Real Education Expenditures	Log of Real Health Expenditures	Log of Real Retail Trade
Log of real investment	-0.266 (0.475)	-0.417 (0.640)	-0.326 (0.498)	-0.263 (0.471)	-0.560 (0.507)	0.269 (0.437)
Log of population	-0.0699 (0.312)	-0.302 (0.420)	-0.494 (0.327)	-0.277 (0.309)	-0.645 (0.333)	0.781*** (0.287)
Log of employment	1.612*** (0.431)	1.444** (0.581)	1.530*** (0.452)	1.483*** (0.427)	1.773*** (0.460)	0.615 (0.396)
Treat	3.037*** (0.745)	2.296** (1.003)	2.424*** (0.780)	2.764*** (0.738)	2.879*** (0.795)	1.285* (0.685)
Treat*After	0.229** (0.105)	0.354** (0.142)	0.277** (0.110)	0.253** (0.105)	0.272** (0.112)	-0.207** (0.0970)
Year dummy	0.0193*** (0.00677)	0.0123 (0.00911)	0.0245*** (0.00709)	0.0203** (0.00670)	0.0230** (0.00722)	0.0741*** (0.00622)
Regional dummy	-1.653*** (0.433)	-1.056* (0.583)	-1.427*** (0.454)	-1.635*** (0.429)	-1.708*** (0.462)	-0.231 (0.398)
Constant	-40.25*** (13.17)	-27.58 (17.72)	-49.83*** (13.79)	-42.88** (13.05)	-47.85** (14.04)	-155.7*** (12.10)
Observations	72	72	72	72	72	72
R^2	0.974	0.948	0.919	0.941	0.913	0.990

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The magnitude of the interaction term is even bigger than shown in Table 3: Since the dependent variable is in logarithms, we have to take the antilog of the estimated interaction term coefficient and subtract 1. If we do that, we end up with 0.26, 0.42, 0.32, 0.29, 0.31, and -0.19 for models 1–6, respectively. In the case of model 1, the magnitude shows that the treatment regions' (Sughd and DRS regions) gross regional product has increased by 26% compared to the control regions (Khatlon and GBAO). The positive impact of the Dushanbe-Chanak toll road on regional budget revenues and expenditures is even larger, ranging from 29% to 42%.

The only anomaly to the uncovered positive impact of the toll road on dependent variables is the last equation, where the toll road is estimated to have lowered the retail trade turnover in real terms by 19%. It seems that by introducing a user fee, the toll road has increased the costs of transportation for small traders, which in turn led to a decrease in the trade turnover in the treatment regions.

However, overall, the impact of the Dushanbe-Chanak toll road on macroeconomic variables seems to be positive. We can hypothesize that the positive impact is due to the reduced time required to transport people and goods, as well as the enhanced reliability and connectivity between the Sughd region and the rest of Tajikistan.

Theoretically, the impact of the toll road could have been even greater if free cross-border trade between Uzbekistan and Tajikistan had been allowed. Unfortunately, until March 2018, the Uzbek-Tajik border remained effectively sealed due mostly to political tensions over water and energy issues between the two countries. A visa regime for citizens of the two countries and unspecified restrictions on trade and transit meant that in 2017 the volume of trade turnover between the two countries amounted to a paltry \$237 million, most of which occurred through intergovernmental contracts.

5. CONCLUSION

1. Tajikistan in recent years has significantly improved its business climate and created a legislative and institutional framework with the adoption of the PPP Law in 2012 and creation of the PPP Unit in 2013 under the State Committee on Investments and State Property Management. The PPP Law has been a significant improvement compared to the Concession Law. However, there are still areas where the Law can be improved in terms of risk sharing, transparency, and clarity. In addition, the PPP Law does not allow a private partner to bring in international arbitration in the case of disputes with a public partner. Instead, disputes would be considered by the Public–Private Partnership Council, consisting of senior Tajik government officials, leaving a lot of questions regarding the objectivity of the dispute settlement mechanism in the PPP Law.
2. Adoption of the PPP Law and creation of the PPP Unit have not led to a stream of PPP projects in the infrastructure sector. But big infrastructure projects have mostly been awarded on a concessional basis, without a competitive process. The country might not be getting the best deal without a competitive process. To demonstrate that competition yields the best value for money, the PPP Unit can solicit proposals for smaller infrastructure projects from foreign and domestic investors.
3. The two infrastructure projects reviewed in this paper – Pamir Energy and the Dushanbe-Chanak toll road – reveal the importance of transparency and public oversight. In the absence of transparency and public oversight, the risk for the public of getting a bad deal increases disproportionately. The Dushanbe-Chanak toll road is a typical example of a project where the public sector is loaded with risk and a private sector company is awarded monopoly rights over one of the most important transport arteries in the country. To avoid this kind of risk in the future, the country should make the decision-making process as transparent as possible.
4. Due to the heavy indebtedness of the country, ability of the Government of Tajikistan to finance infrastructure projects through debt financing is limited. Therefore, PPP schemes, where private investors will bring necessary financing and deal with risks associated with the project, are attractive to the Government. Each successfully executed PPP project improves Tajikistan's image in international capital markets and relieves the government from taking on unnecessary debt obligations.
5. The capacity of the Government of Tajikistan to implement large-scale PPP projects in the infrastructure sector is limited, therefore it should cooperate with international financial institutes (IFIs). Through this kind of cooperation, the government can learn to utilize different project finance modes, such as equity, credits, and grants, for infrastructure development.
6. In both case studies – Pamir Energy and Dushanbe-Chanak Toll Road – the private partners have opted for establishment of a special purpose vehicle (SPV) for managing and operating a PPP project. The SPVs make it possible to bring together many parties, including sponsors, bankers, government agencies, construction contractors, O&M operators, insurers, and guarantors. Under this modality of operations, the SPVs raise funds, manage project cash flow, and pay debt and investors' dividends from the project revenue. The revenue of the project is generated from the fees charged for the service provided to either the public sector or civilians.

7. The experience of Tajikistan shows that, when properly designed, PPP projects can help address social issues such as uninterrupted access to electricity, reduction of fatalities and road accidents, empowerment, social protection, and other problems.
8. Complex PPP arrangements in the infrastructure sector bear high transaction costs and internal capacity constraints, and as such they are not suitable for all projects. Extra caution should be exercised when dealing with projects that have large user fees or use taxpayers' money. Therefore, the public should be properly informed and fiscal risks associated with large infrastructure projects must be properly assessed and monitored.

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