



UNIVERSITY OF CENTRAL ASIA  
GRADUATE SCHOOL OF DEVELOPMENT  
Institute of Public Policy and Administration

# **Macroeconomic Policy Frameworks and Technological Development: Case studies of Kyrgyzstan, Tajikistan and Afghanistan**

Nurbek Jenish



**WORKING PAPER #49, 2019**



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## Abstract

The paper examines recent macroeconomic performance and macroeconomic management frameworks in Kyrgyzstan, Tajikistan and Afghanistan. It also reviews existing literature on macroeconomic policies recommended for technological development of low/lower-middle income countries. The literature review is then complemented with the case studies of Japan, South Korea and the Baltic countries that have succeeded in their own technological development. Drawing on the experiences of these countries and 'traditionally' recommended policy measures suggested by the literature on technological development the paper provides some policy recommendations.

**Key words:** low/lower-middle income countries, technological development, monetary policy, financial sector, fiscal sector, public debt, external sector.

**JEL Codes:** E52, E62, H63, O23

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## Abbreviations

ADB	Asian Development Bank
AKDN	Aga Khan Development Network
ANPDF	Afghanistan National Peace and Development Framework
CPI	Corruption Perception Index
DAB	Da Afghanistan Bank
DSA	Debt sustainability analysis
EEU	Eurasian Economic Union
EGDI	e-Government Development Index
FDI	Foreign direct investments
GDP	Gross Domestic Product
HCI	Heavy and chemical industries
ICT	Information and computing technology
IMF	International Monetary Fund
IT	Information technologies
NBKR	National Bank of the Kyrgyz Republic
NBT	National Bank of Tajikistan
NPL	Non-performing loans
NSED	National Strategy for Education Development
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
PRC	People's Republic of China
R&D	Research and development
SFE	State Fund for Entrepreneurship
SMEs	Small and medium-sized enterprises
SOE	State-owned enterprise
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VAT	Value-added tax
WB	World Bank
WEF	World Economic Forum
WTO	World Trade Organization

## 1. Introduction

Afghanistan, Kyrgyzstan and Tajikistan are small economies with gross domestic products (GDP) of 20.7, 6.3 and 8.5 billion US dollars, respectively (as of end 2016). All of these countries heavily rely on imports and their exports have a narrow (commodity) base: mostly, aluminum, cotton and gold for Tajikistan; gold, agricultural products and textiles (garment) in the case of Kyrgyzstan, and agricultural products and carpets being Afghanistan's main export items<sup>1</sup>. The former two countries also heavily depend on the exports of labor and the resulting remittances income, which constituted around 30 percent of GDP in Kyrgyzstan and 27 percent of GDP in Tajikistan in 2016 (Table A1).

Tajikistan and Kyrgyzstan continue to have one of the lowest GDPs per capita in the region (Table A3). According to the World Bank, they are classified as lower-middle income countries. In the case of Afghanistan, it continues to belong to the group of low-income countries with a GDP per capita below US\$1,000 – the country has been in a state of conflict for the last 35 years.

In general, relatively proper macroeconomic stability frameworks have recently been put in place in these countries<sup>2</sup>. Since 2010, the economies of Tajikistan, Kyrgyzstan, and Afghanistan have performed relatively well with average annual GDP growth rates of 4 percent or above<sup>3</sup>. However, with the exception of Tajikistan, economic growth in the latter two countries has been unstable with some periods of recession and/or close to zero growth rates (Table A2). These countries have also managed to maintain moderate levels of inflation (Table A4) and fiscal deficits (Table A5).

Despite such developments, these countries continue to face significant external and internal vulnerabilities and challenges.

The Russian Federation and Kazakhstan are the main trading and economic partners of Kyrgyzstan. These countries host around 750,000 Kyrgyz migrant workers<sup>4</sup> and are the main destinations for Kyrgyz non-gold exports. Therefore, as the recent economic difficulties of 2014-2015 in Russia and Kazakhstan have shown, downturns in economic activity in these countries substantially affect the Kyrgyz economy through weaker demand for Kyrgyz exports and lower remittances, which are two of the main drivers of aggregate demand.

Similarly, spillovers from the economic slowdown in Russia also significantly affect the Tajik economy, mostly through the remittances. The Tajik economy is also susceptible to external commodity (especially aluminum and cotton) price shocks.

Afghanistan continues to heavily depend on external assistance, which has been the main driving force behind its recent economic growth. Moreover, recently intensifying internal instability coupled with the ongoing influx of returning refugees from neighboring countries have been posing serious challenges to the country's development.

Apart from these, all of the countries under consideration face substantial challenges related to: a somewhat "unsophisticated" structure of their economies based on the low-value added

<sup>1</sup> Excluding the Illicit exports of narcotics in the case of Afghanistan.

<sup>2</sup> There are some serious issues related to macroeconomic management frameworks which are discussed in the following sections.

<sup>3</sup> Pre-2010 economic performance is not considered due to the possible consequences of global financial crisis of 2007-2008.

<sup>4</sup> According to other estimates, more than 1,000,000 workers from Kyrgyzstan work in the Russian Federation and Kazakhstan, with the former hosting the major bulk of Kyrgyz migrants.

agricultural sector (Figures A1-A3) and commodity extraction; a lack of financial resources to build and modernize (physical) infrastructure and as a consequence its inadequacy; and relatively weak governance and corruption.

Given these shortcomings, the prospects of sustainable economic development may be challenging. Realizing this, the governments of these countries have been undertaking policy reforms and measures related to the improvement of their macroeconomic management frameworks.

The objective of this study is threefold. First, it provides an overview of the recent macroeconomic performance and challenges faced by the economies of the Kyrgyz Republic, Tajikistan and the Islamic Republic of Afghanistan. Second, the paper provides a review of the existing literature on macroeconomic policies recommended for the technological development of low/lower-middle income countries. In particular, it provides an overview of the economic policies implemented by South Korea and Japan on their path to development from agrarian/semi-agrarian to industrial economies. In addition, the paper also presents an overview of the recent experiences of the Baltic countries that technologically advanced and reaped the benefits of digitalization. Finally, the policies implemented in the selected Central Asia countries and Afghanistan are examined against “traditionally” recommended policy measures that are aimed at technological development.

The rest of the paper is organized as follows. Section two provides an examination of recent macroeconomic performances and identifies challenges and perspectives facing the countries under review. The next section provides a summary of the literature on the recommended policies conducive to technological development. The fourth section reviews the success stories of selected countries. Digital economy issues are discussed in the next section. Finally, section 6 concludes and draws some policy recommendations.

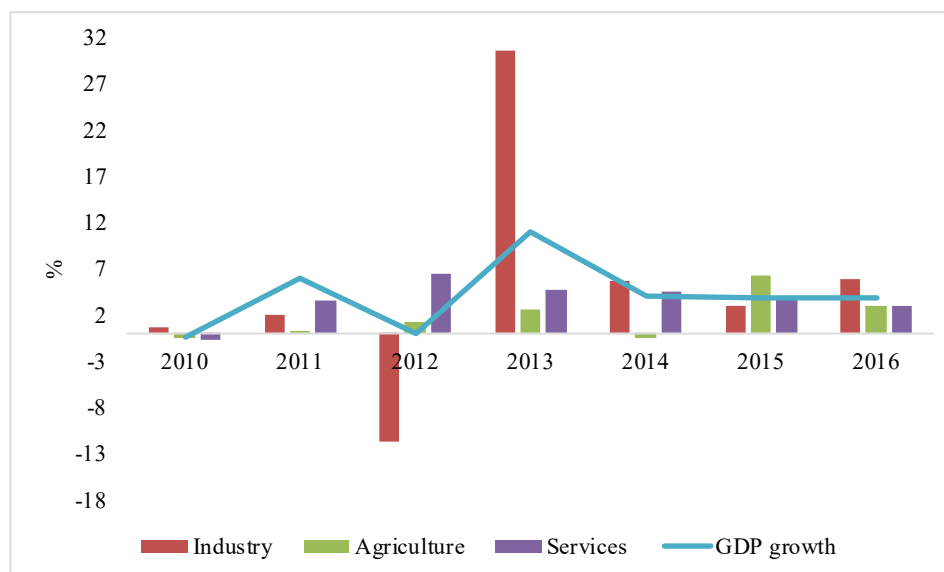
## **2. Overview of recent economic developments in the Kyrgyz Republic, Tajikistan and Afghanistan**

### **2.1. The Kyrgyz Republic**

The country belongs to the category of lower middle-income countries with an economy that is mostly characterized by mineral extraction, agriculture and dependence on remittances from its citizens working abroad, primarily in the Russian Federation and Kazakhstan. Structurally, the country’s economy mainly consists of industry and services. Industry is represented by energy (mostly electrical power generation) and mining. There is also a relatively large number of enterprises of light and food industry.

The recent economic growth in the country has been mainly driven by the expansion in industrial production and remittances, which stimulated the aggregate demand (Table A1 and Figure 1). The increase in industrial production has been primarily due to the expansion of production at the Kumtor gold mine with an annual gold extraction of approximately 17 tons, whose share in the country’s GDP is about 8 percent. Recently, gold extraction was launched at two new relatively large gold mines – Taldy-Bulak Levoberejnyi (with a gold deposit of about 70 tons) and Ishtamberdy (with a gold deposit of around 40 tons).



**Figure 1. GDP growth of the Kyrgyz Republic by main sectors**

Source: Asian Development Outlook

The major bulk of the gold mined in the country is exported. At the same time, most of the proceeds from mining are repatriated through dividends mainly to foreign shareholders and are spent on capital expenditures, which substantially reduces the industry's importance for the country as a budgetary revenue source.

The agricultural sector contributes around 14 percent of the country's GDP and employs 32 percent of the country's labor force. The gross output of agriculture is almost equally divided between livestock and crop production. This sector has been supported by the state through the provision of an interest-rate-subsidized loan program. In addition, all agricultural products are exempt from a 12-percent value-added tax (VAT).

The recent introduction of a visa-free regime for citizens of 61 countries has strongly supported the development of the tourism sector, which has become an important part of the country's income. There are now a large number of travel agencies, employing more than 5.2 percent of all workers in the country. The whole sector accounts for about 8 percent of the country's GDP. According to official statistics, every year more than 2.4 million foreigners visit the country.

### Monetary policy and the financial sector

The monetary policy of the National Bank of the Kyrgyz Republic (NBKR) is aimed at maintaining price stability, smoothing excessive fluctuations of the nominal exchange rate and providing the conditions necessary for sustainable economic growth in the country. The authorities have largely been in control of inflation, with inflation staying within single digits since 2012 (Table A4). The local currency, the som, has demonstrated relative stability vis-à-vis the US dollar. Following severe shocks in 2014-2015 from devaluations of the Russian ruble and the Kazakh tenge brought about by drastic oil price decreases, the Kyrgyz som depreciated from about 48 in the end of 2013 to around 70 soms per US dollar at the end of 2016 (Table A6). To prevent excessive fluctuations of the nominal exchange rate the NBKR was intervening on the local foreign exchange market quite intensively in 2014 and 2015 using its foreign exchange reserves. Following the stabilization of the situation in Russia and Kazakhstan the central bank managed to recover

its international reserves to the pre-2014 level. As of end 2017, the volume of the reserves made up around 2.1 billion US dollars covering about five months of the country's imports (Table A19).

The country's financial system is represented by banks, non-banking financial institutions (credit unions, microfinance organizations, etc.), stock exchanges, insurance companies, and pension and investment funds. In general, Kyrgyzstan has liberal banking and foreign exchange legislation regulation allowing earnings to be freely repatriated. Bank deposits (in the amount not exceeding 200,000 soms) are insured by the State Agency for Deposit Protection.

The financial sector is dominated by the banking sector, which is represented by state and private commercial banks. There are 25 banks operating in the country, with about half of them having foreign capital. In addition to the classical approaches to lending, the country has experience in successfully conducting lending practices on the Islamic principles of banking and finance.

The banking sector has shown resilience in response to recent negative shocks. The share of classified loans increased, though not dramatically, to 8.8 percent at the end of 2016. In general, the sector is characterized by a high level of liquidity. In recent years, both the volume of deposits and loans have been increasing steadily (with the exception of 2015; Tables A9-10). Despite this the interest rate spread between deposits and loans (both in local and foreign currency) persisted to be quite large (Tables A11-14), while the loan interest rates continue to remain high. Obviously, this makes the financial resources for the real sector of the economy expensive and not conducive for long-term economic growth<sup>5</sup>. The economy is also highly dollarized, both in terms of deposits and loan portfolio (Tables A7-8)<sup>6</sup>. This poses risks for the effective conduct of monetary policy and makes the financial sector vulnerable to external shocks.

Finally, the securities market is represented by both state and corporate securities. The extent of the development of the corporate securities market remains insignificant. Performance indicators of insurance companies and non-government pension funds also indicate a lack of development of these segments of the financial system.

## **Fiscal sector and public debt**

Sizable budgetary imbalances continue to be a critical problem (Table A5). Persistent budget deficit carries potential inflationary risks, thus complicating efforts to stabilize inflationary processes in the economy. Although recent budget deficits resulted mostly from the need for financing large infrastructural projects, the criticality of this issue is seen by the continuing budget dependence on external financing<sup>7</sup>. These may result in increasing public (external) debt and the ensuing difficulties with its servicing and repayment, which could thus undermine macroeco-

<sup>5</sup> Following the accession of the country to the Eurasian Economic Union (EEU), Russian Federation and Kyrgyzstan established Russian-Kyrgyz Development Fund (RKDF) with the capital of 500 million US dollars. The main purpose of this institution is to help the country adapt to the new environment through the provision of soft loans to the real sector of the economy. Financing activities of the RKDF helped to support economic growth following 2014-2015 shocks and helped to reduce lending rates.

<sup>6</sup> In the beginning of 2015, the NBKR jointly with the Government started implementation of the de-dollarization program.

<sup>7</sup> Public Debt Management program is in place, which allows to attract external borrowing only on concessional terms. More specifically, the grant element of any external borrowing should not be less than 35 percent; concentration of debt with one creditor should not exceed 50 percent of total external debt. Currently, the government is considering setting a ceiling on total public debt of 70 percent of GDP.

conomic stability. The peak repayments of external debt are expected in 2026-2027. In the beginning of 2018, the Russian Federation agreed to write-off the country's 240 million US dollar debt. At present, the country's public debt is 4.2 billion US dollars, of which 3.9 billion accounts for external debt and constitutes about 58 percent of GDP. While the debt outlook has improved, it remains vulnerable to external and domestic shocks. The joint debt sustainability analysis (DSA) by the World Bank and International Monetary Fund rated the country to be at moderate risk of debt distress.

In general, coordination between monetary and fiscal policies has been improving. However, there is still room for further improvement, especially in the area of timely liquidity projections on the part of the Ministry of Finance. Among other minor shortcomings is the non-uniform distribution of budget expenditures throughout the year in view of the irregular schedule of the receipt of external financing. This may also carry a risk of a subsequent rise in inflationary pressures.

## External sector

Since the early 2000s, the country has been persistently running a current account deficit with imports of goods and services exceeding exports (Tables A15-16) indicating substantial import dependence. The gap has been mostly financed by remittances and informal re-export proceeds (before the tightening of customs administration on the EEU borders and the country's accession to the EEU in 2015). The country imports machinery and equipment, energy products, food items and various consumer goods. On the export side, apart from gold, which accounts for around 40 percent of total exports, the country exports mainly agricultural products and foods, clothing, electricity and some (unsophisticated) machinery and equipment. The non-gold exports mainly go to the Russian Federation and Kazakhstan.

## Structural issues

Kyrgyzstan being a small open economy and not blessed with abundant natural resources needs foreign investment and technology for its development. Given the increasing global competition for the attraction of financial resources the country has put considerable efforts into improving its investment climate with substantial progress made. However, more still needs to be done.

One of the main factors influencing the decisions of foreign investors when entering a market is the country's position in various international ratings. A recent study of the World Economic Forum (WEF) rates Kyrgyzstan 123rd out of 167 countries in terms of corruption, thus indicating a high level of corruption in the country. According to Transparency International, corruption perception remains high, with governance indicators deteriorating (Table A17)<sup>8</sup>.

In the WEF's competitiveness rating, Kyrgyzstan ranks 111th out of 140 countries with problematic areas including corruption and political instability. The country has also struggled to improve its World Bank's Doing Business ranking. It has not improved in the last two years and the country is placed 75th out of 190 countries (Table A18). The country lags behind its post-Soviet peers Kazakhstan, Georgia, Armenia and Moldova, in a number of key areas.

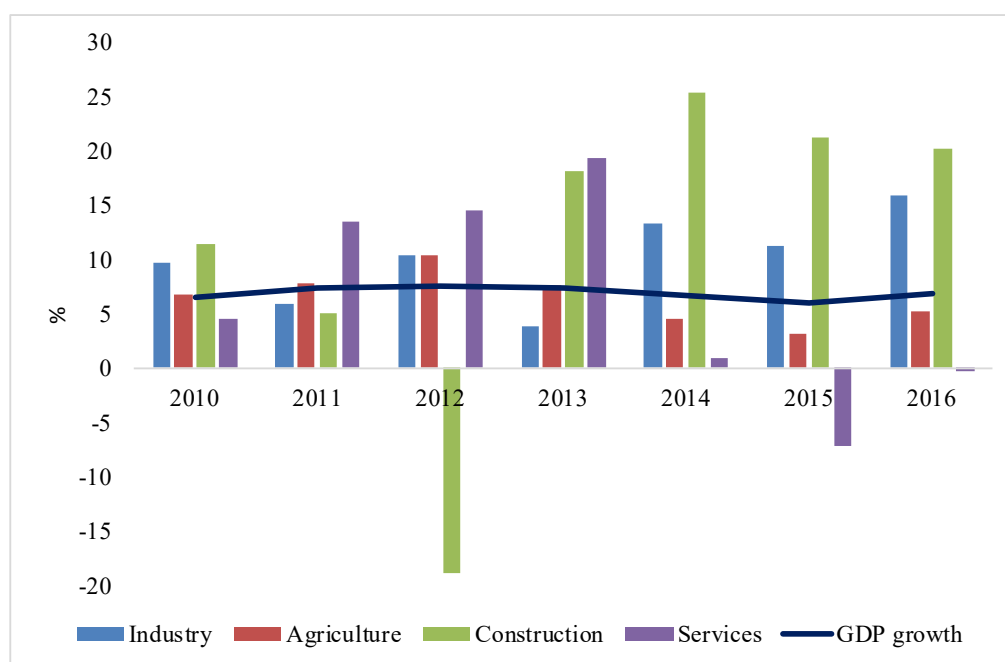
<sup>8</sup> This index is frequently criticized as being largely based on surveys, and, as such, on perceptions and subjective assessments.

These developments indicate that further reforms are needed in the areas of access to electricity, contract enforcement, trading across borders and financial inclusion. These reforms together with large infrastructure investment projects will help the country to improve its business climate and hence competitiveness, especially within the region.

## 2.2. Tajikistan

Tajikistan is an agrarian-industrial country with a share of agriculture and industry of about 21 and 15 percent of GDP, respectively. Since 2010 the economy of the country has been demonstrating quite an impressive rate of growth at 6 percent or above (Table A2, Figure 2). These positive developments can be explained by the growth of key economic sectors: agriculture, construction, services and industry. With the exception of 2012 when the construction sector, and 2015 and 2016 when the services sectors contracted, all of the key sectors have been expanding.

**Figure 2. GDP growth by main sectors**



*Source: Asian Development Outlook 2017*

The main industrial productions include the extraction of minerals, the processing of metals and electricity production. Tajikistan has rich deposits of gold, silver and antimony. The country also produces strontium, salt, lead, zinc, fluor spar, and mercury. Most of Tajikistan's manufacturing plants fell into decay after the collapse of the Soviet Union and due to the legacy of its civil war shortly thereafter. The country managed to retain and modernize two major plants, the Tajik Aluminum Company and the Tajik Cement Plant. Tajikistan's extensive aluminum processing industry heavily depends on imported ore. Unwrought aluminum along with cotton fiber are the main export commodities of the country, thus making the economy susceptible to external shocks associated with fluctuations of global prices for these products.

Tajikistan like Kyrgyzstan is dependent on remittances (Table A1). Remittances make up about 27% of the country's GDP and are the main driving force of the aggregate demand, especially in the services and construction sectors. The remittances largely come from Tajik migrants working in the Russian Federation. Therefore, negative developments in Russia directly affect the country's economy through the reduction of remittances sent to Tajikistan and the consequent decrease of aggregate demand. This happened in 2014-2015 when the services sector first experienced a slowdown and then contracted by around 7 percent in 2015. The contraction of this sector continued in 2016 due to the slow economic recovery and a tightened immigration control in the Russian Federation. This reduction was offset by the strong growth of the construction sector, which has grown by 20 percent annually since 2013 thanks to high public investments.

In the short run, growth will depend on higher public investments in view of low foreign exchange earnings and consequent depreciation pressures constraining private consumption and investment<sup>9</sup>.

### **Monetary policy and the financial sector**

The main objectives of the country's monetary policy are to maintain currency and price stability. Given the drastic decline of remittances in 2014-2016 brought about by the economic downfall in the Russian Federation combined with lower prices for aluminum and cotton, the national currency, the Tajik somoni, came under severe pressure. To withstand these shocks, the National Bank of Tajikistan (NBT) intervened heavily by selling US dollars on the foreign exchange market. As a result, the volume of its then already low international reserves further decreased (Table A19). Despite heavy interventions, the national currency depreciated by about 60 percent during the period 2014-2016 (Table A6), which entailed difficulties in the financial sector given the high degree of foreign currency denominated liabilities. Despite these developments, the NBT managed to keep inflation within single digits (Table A4).

The financial sector consists of banks, which account for more than 80 percent of total financial sector assets, microfinance institutions (accounting for most of the remainder) and other non-banking credit organizations. There are 17 commercial banks, of which one is state-owned, one is majority state-owned and seven with a significant portion of foreign capital.

The banking sector is highly dollarized, with a loan and deposit dollarization of 61.6 and 62.4 percent at the end of 2016, respectively. This, obviously, reduces the resilience of the system and makes it highly vulnerable in the event of currency depreciation. The system's vulnerability is exacerbated by the continued practice of directed lending, including that to state-owned enterprises<sup>10</sup>. The most recent IMF country report flagged the rapid growth of non-performing loans (NPL). The NPL ratio for the six largest banks increased to 28 percent (with the system NPL average of 25 percent) as of end 2014<sup>11</sup>. The situation in the banking sector deteriorated further with NPL increasing to 50 percent of total loans on average in 2017<sup>12</sup>.

Clearly, these negative developments in the financial sector may undermine financial stability and entail large economic and fiscal costs. To maintain confidence in the banking sector, the gov-

<sup>9</sup> Asian Development Outlook 2017

<sup>10</sup> International Monetary Fund 2016. IMF Country Report No.16/41.

<sup>11</sup> Ibid.

<sup>12</sup> Tajikistan Country Economic Update, World Bank, 2017.

ernment recapitalized four banks in the amount of about 500 million US dollars<sup>13</sup>. Despite this the country's two main banks remained operationally insolvent and were breaching regulatory prudential norms in 2017<sup>14</sup>. Such injection of liquidity could create additional pressures on the currency and inflation, which increases public debt.

The interest rate spread between deposits and loans, both in local and foreign currencies continue to be high (Tables A11-A14), thus pointing to inefficiencies in intermediation, which is not supportive of economic growth.

Overall, the low level of international reserves (which covered around two months of the country's imports in 2016<sup>15</sup>), financial sector imbalances and continuing depreciation pressures will pose substantial challenges for the financial and macroeconomic stability of the country.

### **The fiscal sector and public debt**

Following budgetary surpluses in 2010-2012, the government's fiscal balances turned negative due to a weaker collection of domestic taxes and customs duties (Table A5) and increasing capital investment. In the first nine months of 2017 the budget deficit stood at 2.2 percent of GDP<sup>16</sup>.

As a result of increased capital expenditures and banking sector bailout the total government debt increased markedly from 27.5 percent in 2014 to 41.8 percent of GDP in 2016. As of September 2017, public and publicly-guaranteed debt went above 50 percent of GDP due to the issuance of US\$500 million Eurobond, loans from China for public investment projects and the issuance of domestic debt to support the energy sector<sup>17</sup>.

Given the country's high exposure to external shocks and the fact that the major bulk of public debt is external, servicing and repayment of external debt may pose significant challenges in the future. The updated 2017 DSA exercise worsened the country's rating from moderate to high risk of debt distress in view of rapidly increasing external debt and the faded ability of the country to earn foreign exchange to service it<sup>18</sup>.

### **External sector**

Tajikistan, like Kyrgyzstan, continues to run current account deficits, with imports exceeding exports and with the trade gap financed by remittances and income associated with informal trade flows (Table A15-A16). Aluminum and cotton are the primary Tajik exports. In 2014, the volume of exports decreased almost two-fold because of lower prices for aluminum and cotton. In view of increasing capital expenditures, the country recently increased its import of capital-intensive

<sup>13</sup> Asian Development Outlook 2017

<sup>14</sup> Tajikistan Country Economic Update, World Bank, 2017.

<sup>15</sup> It is desirable that the country should have at least 3 months of import equivalent volume of international reserves. Recently, in the first nine months of 2017, reserves increased to around 5 months of imports but this was largely due to the issuance of US\$500 million 10-year Eurobond with a yield of 7.125 percent in September 2017 and thanks to the continuation of the surrender requirement on ruble denominated remittances. Under this requirement, remittance recipients can receive only one third of the transfer in rubles and the rest is disbursed in somoni. As the construction of Rogun hydropower plant accelerates and imports recover reserves are expected to moderate in the medium term.

<sup>16</sup> Tajikistan Country Economic Update, World Bank, 2017.

<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

goods and construction materials. A decrease in exports was accompanied with a substantial decrease in imports in view of the recent economic difficulties the country has experienced, thus narrowing the current account deficit. By and large, dependence on import and remittances and a low level of international reserves pose challenges for maintaining external stability.

### **Structural issues**

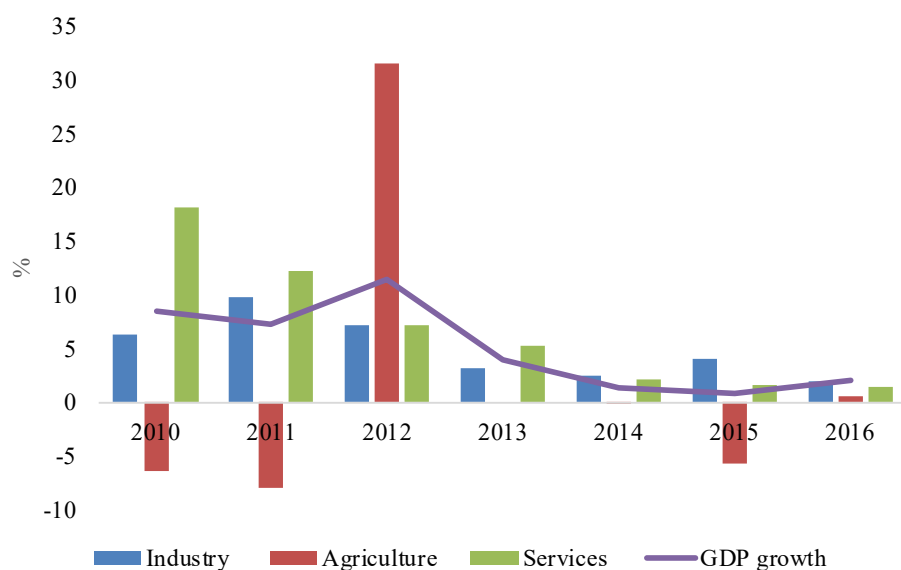
The country continues to face challenges with its business environment. It is ranked poorly relative to its regional peers in the World Bank's Doing Business rating. In 2018, it was rated 123rd out of 190 economies, slightly improving its ranking from 128th place in the 2017 Doing Business report. The country performs relatively well with enforcing contracts (ranked 54) and protecting minority investors (33). However, in most areas it performs relatively poor. Tajikistan is ranked 148th on resolving insolvency, on access to electricity - 171, getting credit - 122, trading across borders - 149, dealing with construction permits - 136 and paying taxes - 132. The complexity of its tax regulations and corruption are also highlighted as main concerns among firms according to the 2015-2016 Global Competitiveness Report of the World Economic Forum. Tajikistan also ranks poorly in the Transparency International rating, falling slightly behind Kyrgyzstan (Table A17). Moreover, tight foreign exchange controls complicate business operations.

These developments point to the necessity of measures and further reforms that ought to be implemented in order to make private investments more attractive.

### **2.3. Afghanistan**

Afghanistan continues to face a challenging political and security environment, which has retarded investments, undermined consumer confidence and constrained business development, thus negatively affecting the economic development of the country. External assistance (in the form of grants) and expenditures associated with military presence have been the main driving force behind the country's recent economic growth. Despite the positive growth rates, though declining since 2013 (Figure 3), and a relatively prudent macroeconomic management framework the country's macroeconomic stability, both internal and external, remains heavily contingent on external support.

The economy continues to be dominated by the agricultural sector with a share in GDP of more than 20 percent (Figure A1). However, agricultural output substantially depends on weather conditions, erratic snow falls and spring rains. The country possesses untapped deposits of gold, copper, iron ore and other minerals with an estimated value of more than US\$ 1 trillion. Extraction of these resources would require significant investments along with the stabilization of the security situation.

**Figure 3. GDP growth of Afghanistan by main sectors**

Source: Asian Development Outlook

### Monetary policy and the financial sector

The primary objective of the country's central bank, Da Afghanistan Bank (DAB), is to achieve and maintain price stability. DAB has followed a monetary aggregate targeting framework, using reserve money as the primary liquidity indicator, along with a managed floating exchange rate regime.

The financial system remains shallow and narrow with one of the lowest credit-to-GDP ratios in the world. It is dominated by commercial banks, with three state and 12 private banks. Similar to Kyrgyzstan and Tajikistan, the system is highly dollarized and, thus, is prone to foreign exchange shocks. The loan and deposit dollarization stood at 61 and 66 percent in 2016, respectively (Tables A7-A8). Following a slowdown in economic activity, financial soundness indicators deteriorated with the ratio of non-performing loans increasing to about 18 percent in 2017 in the second quarter of 2017<sup>19</sup>. This may negatively impact the development of the financial sector and undermine the authority's efforts to enhance financial inclusion.

DAB has been broadly successful in controlling inflation with the inflation rate kept within single digits, except for 2011 (Table A4). However, weak transmission of monetary policy in view of high dollarization and high share of imported goods and services in the consumer basket limit the ability of DAB to control inflation.

Nominal exchange rate developments largely depend on the inflow of foreign aid<sup>20</sup>. DAB undertakes interventions in the foreign exchange market to prevent excessive fluctuations of the exchange rate in view of high exchange rate pass-through to prices and high liabilities dollarization. As of end 2016, the local currency, the Afghani, had depreciated by more than 40 percent against

<sup>19</sup> 2017 IMF Article IV Consultation: Islamic Republic of Afghanistan.

<sup>20</sup> The foreign exchange inflows associated with illicit production and trafficking of drugs are not considered in the paper.



the US dollar since 2010 (Table A6). At the same time, the country's foreign exchange reserves increased from US\$5.2 billion in 2010 to US\$ 7.3 billion in 2016, once again, thanks to aid inflows.

By and large, a strong dependence on external aid and imports, a high degree of dollarization and the difficult security situation will pose serious challenges for maintaining macroeconomic and financial stability.

### **Fiscal sector and public debt**

Despite the difficult circumstances, the government has performed relatively well on the fiscal front. It ran an almost balanced budget with budget deficits not exceeding 2 percent of GDP per annum (Table A5). However, if one ignores donor grants, the country has been persistently running sizable budget deficits in excess of 4 percent of GDP since 2010<sup>21</sup>.

The country's public debt is low. At the end of 2016, it constituted 8.3 percent of GDP (Table A20). However, the country is rated to be at high risk of debt distress given the large underlying fiscal and current account imbalances as even a small shift to loan financing may quickly move the country to an unsustainable debt burden<sup>22</sup>.

Overall, the country will continue to face substantial challenges on the fiscal front given the difficult security situation and ensuing large security spending as well as the low budget revenue generating capacity of the economy.

### **External sector**

The country's volume of legal exports has not increased since 2010 (Table A15) and its structure has remained largely unchanged. The country mainly exports dried and fresh fruits, carpets and rugs, and medical plants. As of 2016, exports stood at US\$1.3 billion. Meanwhile, imports increased from US\$ 7.2 billion in 2010 to US\$9.6 billion in 2016 (Table A16), thus exceeding exports more than fivefold. As a result, the country has been (persistently) running sizable trade and current account deficits since 2010. The trade and current account imbalances have been financed by sizable donor grants along with the proceeds from illegal trade. In 2016, the current account deficit excluding official transfers stood at 31.2 percent of GDP<sup>23</sup>. Although in 2016 gross international reserves covered more than 10 months of the country's next year imports, which may serve as a safety buffer if unanticipated security and economic developments take place, the country's external imbalances coupled with a strong reliance on external grant inflows will pose serious challenges for the country.

### **Structural issues**

Afghanistan has a massive infrastructure gap in the areas of energy, transport, water, urban development and regional connectivity. The country's 2017–2021 National Infrastructure Plan contains projects worth US\$6 billion. Obviously, inadequate infrastructure limits private sector activities and development and hinders economic growth. Moreover, the country's business environment does not support investor confidence. The country ranks poorly in the World Bank's

<sup>21</sup> 2017 IMF Article IV Consultation: Islamic Republic of Afghanistan.

<sup>22</sup> Ibid.

<sup>23</sup> Ibid.

Doing Business report. In 2018, it ranked 183rd out of 190 countries. In particular, Afghanistan ranks poorly in areas such as dealing with construction permits, getting electricity, registering property, protecting minority investors, paying taxes, trading across borders and enforcing contracts.

Another serious issue is the high level of corruption, which remains one of the key obstacles to political stability and economic growth. And although the country has improved its position in the Transparency International rating since 2010 (Table A17), it still ranks 169th in terms of perception of corruption out of 176 countries.

As already discussed, the government's revenue generating capacities are quite limited. Domestic revenues cover only half of its recurrent expenditures with the remainder being financed by foreign grants<sup>24</sup>. If donor aid falls short, the government would have to cut expenditures, including those on security and infrastructure, thus further jeopardizing investor confidence and growth prospects.

## **2.4. Summary of Challenges and Perspectives in Kyrgyzstan, Tajikistan and Afghanistan**

### **Challenges**

Despite relatively proper macroeconomic stability frameworks, Kyrgyzstan, Tajikistan and Afghanistan keep facing challenges inherent to low-income developing countries, which can be summarized as follows:

- Corruption and weak governance. The problem is more acute in Afghanistan
- Underdeveloped financial markets, causing low levels of financial inclusion
- Inadequate infrastructure. This is especially problematic in Afghanistan
- Unstable growth because of a poorly diversified economy
- Weak business climate, especially acute in Afghanistan
- Infirmity of education, critical in Afghanistan
- Heavy dependence on external funds in the form of remittances and/or external financial assistance
- Low-value added and thus “unsophisticated” economies. Economic models in these countries are practically limited to the agricultural sector and commodity extraction
- Difficult security situation in the case of Afghanistan.

Realizing these challenges, the governments of these countries have been undertaking policy reforms and measures related to the improvement of macroeconomic management framework. Policy reforms of Kyrgyzstan, Tajikistan and Afghanistan are framed within mid- or long-term state programs that address most aspects of economic transformation in order to get the economies prepared for further technological development.

### **Perspectives**

<sup>24</sup> Ibid.

### ***Kyrgyz Republic***

Current government framework for policy reforms is formulated in the government program “Trust, Unity, Creation: 2018-2023” under the long-term Strategy for Sustainable Development of the Kyrgyz Republic 2018-2040.

The main objectives are three-fold and aimed at achieving and improving:

- Economic welfare
- Social welfare
- Favorable and safe environment.

Within these objectives, the government sets the following (macroeconomic) targets to be achieved by 2023:

- GDP growth by at least 4 percent annually
- Stable growth in real incomes of population
- Decrease poverty down to 20 percent
- Getting Kyrgyzstan in:
  - Top-70 countries in the United Nations’ Human Development Index list, World Economic Forum’s Global Competitiveness Report, and Transparency International’s CPI,
  - Top-50 countries in the WB’s Doing Business report.

### ***Tajikistan***

Current challenges are addressed in the National Development Strategy of Tajikistan to 2030, which aims to accelerate investments, improve the industrial sector, and diversify the national economy. The main key (macroeconomic) targets to be achieved under the Strategy are:

- Average annual growth of 7-8 percent
- Increase private investments to 22 percent of GDP and growth of industrial share to 21 percent of GDP by 2030
- Reduce export concentration index for the three main products from 83 to 58 percent.

### ***Islamic Republic of Afghanistan***

To overcome structural and macroeconomic impediments, the authorities pursue structural reforms by fostering the Afghanistan National Peace and Development Framework (ANPDF) for 2017–2021. The main goals of ANPDF 2017-2021 include:

- Reducing dependence on donor assistance
- Improving the welfare of people and reducing poverty by creating jobs in agriculture and energy
- Development of infrastructure and regional integration.

- The government sets to attain the following key macroeconomic targets under ANPDF 2017–2021
- Average GDP growth of 5 percent per year until 2020
- Increase of development budget expenditures by 10-15 percent each year
- Increase domestic revenue by 12 percent annually, with the goal of having domestic revenues account for 14 percent of GDP by 2020.

In sum, the countries under consideration have adopted and pursue macroeconomic management frameworks aimed at securing macroeconomic stability and development. These policies are generally agreed to be prerequisites for and/or accompanying technological development. In the context of technological development, it would be worthwhile examining the experiences of Japan and South Korea on their technological development path.

These economies have frequently been used in the literature as development models for low/lower-middle income countries. Clearly, not all of their policies and their sequencing may be applicable for the countries under consideration here given the immense cultural and historical legacy differences, starting point conditions, and many other peculiarities. In a nutshell, these are the main aspects on which the criticism centers when developing countries consider replicating the experiences of Japan and South Korea.

More recent examples of technological development are the Baltic countries, namely, Estonia and Lithuania. These countries used to be part of the Soviet Union, like Kyrgyzstan and Tajikistan<sup>25</sup>. Nowadays, they are recognized as some of the most economically-stable information technologies (IT) destinations in Europe with the IT and related sectors attracting large amounts of foreign investment and considerably contributing to economic growth.

The next section of the paper will provide a brief overview of the existing literature on the traditional set of policies recommended for the technological development of low/lower-middle income countries and where the concerned countries stand against these recommendations. The overview is next complemented by the case studies of Japan, South Korea and the Baltic countries, which is then followed by a discussion of their relevance for the countries under consideration.

### **3. Literature review on suggested macroeconomic policies for low/lower-middle income countries**

In the context of globalization, technology plays one of the key roles in helping developing countries to achieve sustainable growth. Impediments to technological development include an inadequate level of education, weak infrastructure, political instability, and complicated access to financial services. Most of the existing literature on the technological development in low/lower-middle countries recommends policies in the following areas.

#### **Education**

<sup>25</sup> Latvia is not considered in the paper since its degree of technological development is more modest relative to that of Estonia and Lithuania.

An educated population plays an important role in technological development and facilitates the acceptance of technological innovation by society<sup>26</sup>. At the same time, innovation systems require well-educated researchers, teachers, and producers to develop relevant innovations. It is generally easier for firms with a well-educated and relevantly skilled staff to adopt technological innovations. To improve education in developing countries it is important to invest not just in basic education, but secondary, technical and higher education, and a system of life-long learning<sup>27</sup>. Concerning the education issue in developing countries, it is also vital to cope with the 'brain drain' problem by providing different incentives for well-educated specialists to stay in their home country.

## Foreign Direct Investments, Macroeconomic stability and Governance

Macroeconomic stability (stable inflation, financial stability, and economic growth), a friendly business environment and trust in institutions (justice, security, property rights, and low corruption) are the key factors to encourage foreign companies to invest into developing countries. Foreign direct investments (FDI) act as a stimulant to the technological development process by contributing to the learning and development of technological capabilities of locally owned firms<sup>28</sup>.

## Infrastructure

Policies in this area encourage more investment into two kinds of infrastructure. One is traditional physical infrastructure needed to access the global economy – roads, ports, and airports. The other is information and computing technology (ICT) infrastructure<sup>29</sup>. Development of ICT infrastructure includes widening access to the internet. Nowadays the internet is an effective and quick tool for exchanging scientific knowledge and advancing education and research, which promote economic and social development<sup>30</sup>. Overall, a developed infrastructure is important in linking firms to markets, reducing food waste, boosting productivity, raising profits, and encouraging investment in innovative techniques.

## Financial Inclusiveness

One of the main sources of funds for the private sector in developing countries is bank borrowings. To implement innovative technologies it is crucial for firms to have access to long-term and low cost loans<sup>31</sup>. This is especially crucial in rural areas, where financial services are not well spread as in the cities. Apart from affordable financing, it is important that individual and businesses have access to other affordable financial products and services, such as payments, savings, and insurance.

<sup>26</sup> Agricultural Innovation Systems: A Framework for Analyzing the Role of the Government”, OECD, 2013.

<sup>27</sup> Dahlman, Carl (2008), “Technology, Globalization, and International Competitiveness: Challenges for Developing Countries”.

<sup>28</sup> Gachino, Geoffrey (2006), “Foreign Direct Investment, Spillovers and Innovation. The Case of Kenyan Manufacturing Industry”, UM-Ph.D, Unpublished Thesis

<sup>29</sup> Ibid.

<sup>30</sup> Miah, Muhammed and Adnan Omar (2012), “Technology Advancement in Developing Countries during Digital Age”, International Journal of Science and Applied Information Technology, Volume 1, No.1.

<sup>31</sup> OECD (2015), “Analyzing Policies to Improve Agricultural Productivity Growth, Sustainably”.

## Kyrgyz Republic

### Education

In general, a notable barrier to the development of technology in developing countries is a low level of education. In the case of former Soviet Union countries, Kyrgyzstan and Tajikistan have gone through difficulties in the education sector, such as lack of financing, brain drain, etc. And although the youth literacy rate for both men and women is 100 percent; the same among adults is 100 percent and 99 percent, respectively<sup>32</sup>, the results of PISA-2006<sup>33</sup> and PISA-2009 for the Kyrgyz Republic confirmed the existence of structural problems in its (secondary) education system. The PISA list also clearly shows that the general knowledge level of Kyrgyz students is below average.

In general, there are two aspects to assess the level of education: accessibility and quality. The availability of all levels of education, except pre-school<sup>34</sup>, in Kyrgyzstan is at a relatively high level. However, the quality of education has deteriorated. Among the main reasons for this include a shortage of qualified personnel and training materials, corruption and bribes, relatively high cost of education, and outdated standards and training methodology. The state consistently attempts to reform the education sector, but serious challenges and problems continue to persist.

Statistically, only one-fifth of graduates with a major in pedagogy in the country consequently become teachers. The shortage of teachers is especially acute in the regions: it has become common for teachers to teach several different classes. In response to this, the government started to attract young specialists by raising salaries and providing various monthly allowances. Nevertheless, the problem persists since in practice the (real) wages are not competitive and grow at lower rates relative to the market.

Another problem is a lack of textbooks: the government allocates only a sixth of the required financial resources for this, while non-government grants also do not solve the problem. To settle this issue, the government launched the 'E-School' program, which presupposes the provision of computers for each schoolchild.

The Ministry of Education and Science pointed to information overload as a reason for the failure in PISA, and in 2012 reduced the number of academic hours for basic subjects. The outcome of this move is yet to be examined as some education experts are critical of this initiative. Some, in fact, argue that it may negatively affect the overall level of competitiveness of Kyrgyz schoolchildren.

Tertiary education also needs to be modernized and brought in line with the needs of the country's economy. There are more than 50 universities in the country with more than 200,000 people obtaining higher education each year. However, in general, the situation with the quality of higher education is more or less the same as in schools. Low salaries is one reason for the shortage of faculty members; statistically, only 10 percent of faculty members have an academic degree. In an attempt to solve these problems, in 2012 Kyrgyzstan moved to a two-tier education system in line with the Bologna Process. However, this has not solved the accumulated problems. According to the Ministry of Labor and Social Development, only around 10 percent of university

<sup>32</sup> Source: <https://data.unicef.org/country/kgz/>

<sup>33</sup> The Programme for International Student Assessment, a worldwide study conducted by the Organisation for Economic Co-operation and Development (OECD) in member and non-member nations of 15-year-old school pupils' scholastic performance on mathematics, science, and reading.

<sup>34</sup> Pre-school education covers only 21.4% of the total number of pre-school children.

graduates can find a job in their academic specialty after graduation. In 2015, about 70 percent of the labor market demand included applications for production workers and specialists in different fields of services.

In sum, the country needs to strengthen its policies aimed to improve the quality of secondary and tertiary education. Financial incentives are unequivocally important for attracting qualified teaching personnel. Along with more stable financing of schools in terms of equipment, it would be desirable to expand the 'E-School' program to address, among other things, the lack of textbooks. This would obviously require affordable internet access for all educational institutions as well as students. In the higher education system, it is desirable to decrease non-core study majors, encourage the recruitment of students to engineering and IT related fields, and introduce a principle of government order and recruitment.

### **Foreign Direct Investments and Financial Inclusiveness**

According to official statistics, the main foreign investors of the Kyrgyz Republic are the People's Republic of China (PRC), Canada, and the United Kingdom (UK). The investments from the PRC are mainly concentrated in geological exploration and manufacturing enterprises, from the UK – in geological exploration, and from Canada – in manufacturing enterprises and mining. As for the Eurasian Economic Union, the most significant investments come from the Russian Federation and Kazakhstan. The latter mainly invests in financial activity and insurance, wholesale and retail trade enterprises, and manufacturing enterprises; and the former – in electricity, gas and air conditioning supply enterprises.

Realizing the importance of the role of investors for economic development, Kyrgyzstan consciously adheres to the liberalization of investment legislation, and provides broad rights and guarantees to foreign investors. The country has concluded a number of bilateral international treaties on the mutual support, promotion, and protection of investments.

Moreover, the country has adopted a wide range of investment incentives. According to a study conducted by the World Bank in 2015, there are about 80 investment incentives in Kyrgyzstan, including 53 fiscal stimuli<sup>35</sup>. By segments, incentives are provided to enterprises in agriculture, small businesses, the financial sector, the Park of High Technologies, international and domestic transportation, and the garment industry. Investment incentives also affect enterprises with foreign investments, public-private partnership projects, equipment imports, and activities under the free economic zone regime. There is also a simplified procedure for issuing investment visas.

However, the results of the last year(s) show a decline in investment activity despite significant efforts undertaken by the government to increase the country's investment attractiveness. So, what is happening and why is the policy on attracting FDI into the country with liberal legislation, a convenient strategic location and a cheap labor force still ineffective?

The answers remain beyond the investment policy of the government. One is the high level of corruption, exacerbated by political uncertainty, and litigation and scandals with large investors. In general, the latter problems are mainly attributable to the mining sector. Nowadays, almost all mines are problematic to different extents. Some investors avoid making investments due to the high risks of potential conflicts with the local population. On the other hand, there are signs

<sup>35</sup> Review of Investment Incentives Inventory in the Kyrgyz Republic. IFC Investment Climate Advisory Services Project in the Kyrgyz Republic.

of a somewhat worsening of the business climate, reflected by the deteriorating position of the country in the WB's Doing Business report. Therefore, one of the main issues that the government should address is the negative (long-term) expectations of investors, who may feel that the current situation would not change in the near future.

As for financial inclusiveness, universal finance access is low in Kyrgyzstan, mainly due to the limited scale of the country's financial sectors. The preference of financial institutions for urban centers creates a rural/urban imbalance. This situation is also aggravated by the country's challenging topography. In general, the main barriers include: (i) high fees and low income, (ii) relatively high cost and time to travel to the nearest branch, especially in rural and remote areas, and (iii) overall low level of financial literacy of the population. To address these issues, the National Bank of the Kyrgyz Republic together with the government launched two major state programs aimed at increasing financial literacy, and increasing non-cash transactions in the economy through the creation of incentives for increasing the number of ATM machines, POS-terminals, etc., with the main focus on rural and remote areas. Finally, as already discussed above, the authorities should preserve macroeconomic stability and also implement programs, which will help bring interest rates on loans down making them more affordable for private sector development.

## **Infrastructure**

According to a recent WEF's competitiveness report, Kyrgyzstan ranks 109th out of 137 countries in the rating for infrastructure development, which includes transport, telephone communication, and electricity. For comparison, Kazakhstan is 68th, and Russia – 39th. Tajikistan, whose infrastructure has been previously considered the least developed among Central Asian countries, is now 99th.

With regards to transport infrastructure, the country occupies 127th place out of 137. The most deplorable is the situation concerning quality of air transport infrastructure and quality of roads. Similarly to the WB's Doing Business report, the report on competitiveness points to a low quality of electricity supply. The country's modest budgetary capabilities are not conducive to infrastructure network development since it is associated with a high cost of rehabilitation, creation, and operation of infrastructure facilities.

The poor condition of the country's transport network is directly related to unstable financing. The annual allocation of funds covers only a fifth of the total demand of the country's road industry. As a result, most of the work to improve the condition and maintenance of public roads (including regional and international routes) is financed with the assistance of international financial institutions and some bilateral donors.

As for the energy industry, it is in a difficult financial situation. The sector's assets have become morally and technically obsolete. Despite the country's vast energy capacity, the gap between electricity demand and supply has been growing. The growth of domestic demand means that the country has a smaller amount of surplus energy for exports and is forced to import electricity at high prices. The liquidation of this gap will require significant investment in the reconstruction of existing assets and the construction of new generating facilities.

To ensure the sustainability of the energy sector, the government has been advised by international experts to bring the tariff policy in line with the level of actual costs. As for the transport



sector, it is necessary to explore opportunities to ensure the development of mutually beneficial regional cooperation through the integration of roads and railway networks of the country into existing international transportation networks. It is also worth exploring opportunities for attracting private investments to these sectors.

## Tajikistan

### Education

Although the literacy rate in Tajikistan is about 98 percent, the country faces similar challenges like in Kyrgyzstan. Decreasing quality of education since the collapse of the Soviet Union has reduced the levels of education among young people. The country's education system suffers from insufficient infrastructure and a deficit of teachers at all levels, also partially due to robust population growth. The state-supported Soviet system is preserved, but weak economic conditions and years of civil war strongly reduced funding in the early 2000s. The civil war prompted many educated Tajiks to leave the country, which resulted in a speedy exodus of the Russian population too<sup>36</sup>.

Government spending began to increase in 2004. Today the expenditure share on education in Tajikistan is comparable to countries at a similar stage of development and makes up 5.2 percent of GDP. For comparison, in Afghanistan and Kyrgyzstan these figures are 3.3 and 5.5 percent, respectively<sup>37</sup>. Despite these positive developments, in 2014 the United Nations Development Programme's (UNDP) Human Development Report ranks the human development of Tajikistan at 129th place out of 188 countries, with a Human Development Index of 0.627, the lowest among the countries of Central Asia, Central and Eastern Europe and the Commonwealth of Independent States. Kyrgyzstan and Afghanistan ranked 120th and 169th, respectively. According to the UNDP's classification, both Kyrgyzstan and Tajikistan belong to the group of "medium human development", whereas Afghanistan belongs to the "low human development" group.

To tackle these problems Tajikistan has adopted different state education programs and national education plans. Most of the measures for education development are reflected in the National Strategy for Education Development (NSED) until 2020. NSED includes an analysis of the main risks and problems in the country's educational system with remedies to improve the situation in the sector. Overall, the problems are somewhat similar to those of Kyrgyzstan, which include: lack of financing, weakening quality of teaching personnel, and overproduction of students with specializations not demanded by the economy. Consequently, the possible measures that may improve the situation are somewhat similar to those for Kyrgyzstan and may include encouraging the recruitment of students to engineering and IT related fields, and introducing a principle of government order for certain specializations with consequent guaranteed employment.

### Foreign Direct Investments and Financial Inclusiveness

Tajikistan mostly attracts state-led investments and external loans from larger economic partners, like China, Russia, and Iran.<sup>38</sup> Due to the country's underdeveloped infrastructure, weak

<sup>36</sup> Currently, the loss of Russian language training in Tajikistan has been particularly compromising for youth. Therefore, their job prospects in Russia are going to be limited without a Russian language basis. This is more of a problem for Tajik youth than for Kyrgyz.

<sup>37</sup> World Bank Databank.

<sup>38</sup> <https://www.state.gov/e/eb/rls/othr/ics/2017/sca/270031.htm>

rule of law, and excessively burdensome tax policy, the business environment in Tajikistan is not so favorable.<sup>39</sup> Additionally, most of the profitable sectors in Tajikistan are appertained to state-owned enterprises (SOEs), which receive a larger percentage of government contracts than private sector competitors do. Therefore, private firms are not able to compete successfully with SOEs unless they have good government connections.<sup>40</sup> For instance, total investments in Tajikistan constituted 20 percent of GDP in 2016, whereas in Kyrgyzstan it made up 30 percent of GDP<sup>41</sup>. At the same time, the net inflow of FDI stood at 5 percent of GDP. This slack investment climate is reflected in the Doing Business report, where Tajikistan is ranked 128th on the ease of doing business, much weaker than that of Kyrgyzstan.

In terms of education's incapacity to develop skilled workers, FDI represent a good source of knowledge and technology diffusion throughout domestic firms. Although there are no laws that discriminate against foreign investors by prohibiting, limiting, or conditioning foreign investment in any of its economic sectors, Tajikistan lacks the international investor confidence as a result of instability and corruption in the country<sup>42</sup>. Another impediment for foreign investments is its geographical location and inadequate infrastructure that increases transportation costs.

According to a recent study conducted by the Asian Development Bank (ADB), the main barriers for the development of the private sector in Tajikistan are low domestic savings, declining loans to private enterprises, and persistent concerns about the difficulty of obtaining loans, namely concerns about collateral requirements and unofficial costs (bribes)<sup>43</sup>. To facilitate greater access to financial services for private firms, the government of Tajikistan founded the State Fund for Entrepreneurship (SFE) in 2013. The main goal of the Fund is to support entrepreneurs in the manufacturing sector, mainly from peripheral areas, by providing them with soft loans. In addition, other issues that should be addressed to improve financial inclusiveness are similar to Kyrgyzstan, e.g. low financial literacy, high fees and indirect costs, high interest rates on loans, etc.

## Infrastructure

Due to the challenging topography, like in Kyrgyzstan, Tajikistan faces serious obstacles to the development of adequate infrastructure that mainly includes power supply, water management, and transport connectivity. The government of Tajikistan jointly with different international organizations and financial institutions such as the ADB, WB and Aga Khan Development Network (AKDN) implements diverse programs and projects to ameliorate the existing situation in infrastructure. For example, according to ADB's country partnership strategy for the period of 2016–2020 to increase the international advantages and improve the investment climate of Tajikistan it is necessary to develop and improve its transport, energy, and municipal infrastructure. These include rehabilitation and construction of several hydroelectric power stations, power transmission and distribution lines; construction of **roads** connecting remote areas and enhancing regional connectivity; rehabilitation of existing and construction of new irrigation systems. Obviously, modest budget capabilities will pose serious challenges for infrastructure development.

<sup>39</sup> <http://www.worldbank.org/en/country/tajikistan/overview#1>

<sup>40</sup> <https://www.state.gov/e/eb/rls/othr/ics/2017/sca/270031.htm>

<sup>41</sup> World Bank Databank.

<sup>42</sup> <https://thediplomat.com/2016/09/assessing-tajikistans-growth-potential/>

<sup>43</sup> Tajikistan: Promoting Export Diversification and Growth. Asian Development Bank, August 2016.

Therefore, it is also worth exploring opportunities for attracting private investments to these sectors.

## Afghanistan

### Education

Permanent war and conflicts lasting for decades have been the main impediment for the development of the education system in Afghanistan. Since the fall of Taliban in 2001 there has been a strong improvement in the country's education sector. According to official statistics, the number of secondary school graduates increased from 10,000 in 2001 to more than 266,000 in 2013; enrollments to universities rose from 7,800 in 2001 to 174,425 in 2015. Nevertheless, due to the lack of highly-skilled teachers and insufficient infrastructure the level of literacy and education is still at a low level. For example, in 2015 the literacy rate in Afghanistan was only 38 percent, which is less than that of neighboring Pakistan (56 percent) and Iran (87 percent)<sup>44</sup>.

The Afghan government closely cooperates with international donors to ameliorate the situation in the education sector. The main source of assistance comes from the United States Agency for International Development (USAID). For example, in 2016-2017 USAID supported the establishment of 4,055 community-based education classes, 2,437 Accelerated Learning Centers; equipped over 154,000 teachers; trained over 17,000 school principals and administrators; and printed and distributed 47.7 million textbooks<sup>45</sup>. One of the joint projects of the government of Afghanistan and USAID is the implementation of the One Laptop per Child project designed for the provision of customized laptops to pupils in Kabul schools. These computers are to be integrated into the educational curriculum, enabling students to access educational resources, email, internet, and many other educational programs<sup>46</sup>. Clearly, enormous work has to be done in the near future to restore and develop the country's educational system.

### Foreign Direct Investments and Financial Inclusiveness

A tense political situation, high levels of corruption, and weak infrastructure are the main obstacles for the development of the financial sector and attraction of foreign investments into Afghanistan. For example, in 2005 FDI inflows accounted for only 0.8 percent of GDP. Afghanistan has taken some measures to develop its financial sector. However, more policies and programs leading to the sector's development are needed.

One of the main programs to lower corruption and increase transparency of the government, which is essential for attracting foreign investments, could be the implementation of electronic governance. E-governance can improve the ability of the government to coordinate and make real-time decisions, which will also compel government officials to be more accountable<sup>47</sup>.

Access to banking services for most of the Afghan population is hampered. The number of people using various banking instruments, such as debit and credit cards is small. There is a limited number of ATMs in five of the country's major cities, and which are mostly situated indoor and

<sup>44</sup> <https://wenr.wes.org/2016/09/education-afghanistan>

<sup>45</sup> <https://www.usaid.gov/afghanistan/education>

<sup>46</sup> Source: <http://seeta.in/j/technology-set-ot-revolutionize-education-in-afghanistan.html>

<sup>47</sup> <http://afghanistanembassy.org.uk/english/3155/>

not outdoor due to the high threat of theft. Therefore, most transactions are carried out in cash. Among the positive developments on this front was the establishment of a mobile-money service (M-Paisa) in 2009. M-Paisa not only provides direct-payroll deposits to the public sector, but also provides services like mobile person-to-person transfers, point-of-sale merchant payments, and microfinance loan disbursements and repayments<sup>48</sup>.

According to the 2014 World Bank's Findex report, only 9.96 percent of the Afghan population aged between 15 and 65 years have an account with banks that operate in the country.

Overall, the availability of financial services both in urban and rural areas of Afghanistan is still very low. The main reasons for this could be political instability, low income level, lack of trust in the government, lack of financial literacy, lack of suitable products meeting the needs of the poor, absence of bank branches in the vicinity, and corruption.

Therefore, more work should be done leading to an increased number of bank branches, expanded array of available financial services, raised awareness of the benefits of financial inclusion and a strengthened regulatory framework needed for the development of the financial sector.

## Infrastructure

As discussed above, Afghanistan needs tremendous financial resources to build new and maintain existing infrastructure, including roads, water supply systems, schools, clinics, hospitals, etc. Security threats, forbidding geography and shortages of trained technicians also continue to pose additional challenges. Currently, the majority of the population has limited access to electricity, internet (only 10 percent of the population uses the internet)<sup>49</sup>, and potable water. Underdeveloped roads hamper the movement of goods to domestic and international markets. Therefore, the country's infrastructure development will require well-designed government policies, donor assistance as well as foreign investments.

## 4. Lessons from Japan, South Korea and the Baltic Countries

### Japan

After World War II, the Japanese economy was in ruins. However, it did not take long for the country to recover and jump on a high economic growth trajectory. Within a relatively short period, the country also managed to drastically enhance its technological and production capacities, from producing cheap and low-value added to high-technology intensive products, which are exported to every part of the world.

There have been a lot of studies devoted to the examination of the factors behind the "Japanese miracle" and various explanations thereof have been put forward<sup>50</sup>. Nonetheless, a somewhat general agreement has emerged over the main factors behind Japan's industrial (technological) development, which can be summarized as follows.

<sup>48</sup> <http://world.time.com/2013/03/02/how-afghanistan-is-on-the-leading-edge-of-a-tech-revolution/>

<sup>49</sup> World Bank Databank

<sup>50</sup> For instance, T. Ito (1992) "The Japanese economy" provides an excellent overview and analysis of the main stages and factors behind economic development of Japan.

Education is generally agreed upon to have played an important role in the economic development of the country, which has a long history tracing back to *Edo period*. According to some estimates, there were more than 15,000 *terakoya* (temple schools) in towns and villages at the end of the era<sup>51</sup>. In 1879, the country introduced a compulsory education system. As a result, in 1905 about 95 percent and 9 percent of children were enrolled in primary and secondary schools, respectively<sup>52</sup>. Obviously, such a literate workforce was crucial for laying the foundation for economic development.

A distinctive feature of the Japanese economy supportive of economic growth and development was the high savings rate. During the mid-1950s to 1972 the country was growing at about 10 percent annually. Growth was supported by large savings, which financed high investment demands without resorting to external financing. Among the possible explanations of this phenomenon are a non-inflationary economy (macroeconomic stability), a pro-saving mentality, and the widespread presence of saving postal offices (which allowed the population to deposit and withdraw money).

With regard to the private sector, one of the features which arguably fostered its development and that recently raised extensive academic debates is “Japanese-style management”. Some argue that this feature, including lifetime employment, seniority-based wage and promotion, and enterprise unions<sup>53</sup> secured stable employment for workers and thus their loyalty to firms. This, in turn, positively affected firms’ long-term investment strategies and contributed to their development<sup>54</sup>. Another distinguishing element of industrial organization in Japan is enterprise groups, *keiretsu*, and the division between large, and small and medium size enterprises. The latter are usually affiliated with the former and work as their subcontractors. The smaller firms usually employ low skill (temporary) workers and pay low wages. In times of economic downturns, the smaller firms act as a “buffer” for larger companies by firing their workers.

A sound bureaucratic system, which is relatively independent from the political situation, is also argued to be conducive for the economic and technological development of the country. Policy decisions tend to be more economically oriented rather than politically motivated<sup>55</sup>. It is argued that at least until the 1980s, the Japanese economy had developed through a consolidated trinity system, which combines the private sector, the bureaucratic system and the government<sup>56</sup>. The government also played an important role in supporting the economic development of the country through a variety of policy interventions. For instance, technological development was supported by direct and indirect production, research and development subsidies for targeted sectors. The government has also promoted high-technology sectors through direct subsidies to research and development (R&D) activities, special deductions for R&D costs, tax preferences and low-interest loans by public financial institutions<sup>57</sup>.

<sup>51</sup> Shoji Nishijima (2012) “Japanese industrial policy”, *Perspective of the World*, v.4, N3.

<sup>52</sup> *Ibid.*

<sup>53</sup> It is argued that enterprise unions are generally more cooperative with the management compared to labor unions.

<sup>54</sup> However, there is a criticism that this success factor was related to the specific period of time. And currently after years of stagnation, this feature can be, on the contrary, behind the lack of competitiveness of Japanese firms.

<sup>55</sup> T. Ito (1992) “The Japanese economy”.

<sup>56</sup> Shoji Nishijima (2012) “Japanese industrial policy”, *Perspective of the World*, v.4, N3.

<sup>57</sup> Yoko Harayma (2001) “Japanese technology policy: history and new perspective”. RIETI Discussion Paper series 01-E-001. Tokyo: Research Institute of Economy, Trade and Industry.

Of course, there are some alternative explanations as for the rapid post-war growth in the country. Some argue that Japan was “deceptively poor” and much of its remarkable growth performance was convergence from a perturbation back to a long-run steady state growth path<sup>58</sup>. For instance, Japan was the first country in the world to build a purpose-designed aircraft in 1922 and shortly after produced a variety of military aircrafts, as such pointing to its substantial degree of technological development and human capital. Thus, the country already then possessed a capable population and advanced technologies, but simply lacked the physical capital with which to work.

All in all, a combination of an educated and disciplined labor force, prudent government policies, including government support to selected sectors of the economy (“picking the winner” policy), and promotion of small and medium-sized firms were behind “the Japanese model”.

However, since the 1990s the economic performance of the country has deteriorated. Some relate this to the ineffectiveness of old development strategies that use traditional policy tools to address both global and domestic changes, such as financial sector liberalization and the consequent removal of international capital controls, and strained adjustments in private sector practices, forced by the WTO and USA abandonment of some practices that have allegedly protected some of the sectors. Moreover, the technological rise and development of China, South Korea and other developing economies has undermined the external competitiveness of the country. Today, many developing countries point rather to South Korea and Taiwan as development models to be emulated.

## South Korea

South Korea (hereinafter referred to as Korea) is one of the few recent examples of countries that managed to transform its agriculture-based economy into one of the most industrially and technologically advanced economies in the world. Following the Korean War, South Korea was one of the poorest countries in the world with a per capita GDP of US\$79 in 1960. During the 1950s, the country suffered from a shortage of food and was extremely dependent on official development assistance (ODA), which accounted, on average, for more than 10 percent of the country’s gross national product. Most foreign aid came in the form of consumer goods, rather than capital goods. The country was also running a chronic balance of payments deficit, with fish, plywood and fabrics being the main export items.

Since then, the Korean economy has grown by about 8 percent per year. GDP per capita has increased more than 200-fold compared to 1960 and exceeded US\$25,000 at the end of 2016. Nowadays, the country takes one of the world’s leading positions in the production of sophisticated and high value-added products, which are exported to every region of the world. For instance, in 2008, the country was the world’s 5th largest steel producer, despite a severe shortage of domestic iron ore and thanks to advanced low-cost steel production technology<sup>59</sup>. The country is the world’s 5th largest automobile producer. Korea’s automobile production increased from 7,000 units in 1967 to 3.8 million in 2008. Korea is number one in shipbuilding, with almost half of all ships in the world being built in Korea. The country also holds the world’s leading position

<sup>58</sup> Marcus Noland (2007) “Industrial policy, innovation policy, and Japanese competitiveness”. Working paper N07-4, Peterson Institute for International Economics.

<sup>59</sup> For example, according to the 2013 Minerals Yearbook, in 2013, Korean domestic iron ore production was 663,000 t compared with domestic consumption of 63.9 Mt.

in the production of petrochemical products and ranks 5th in the world. Finally, the country has the world's leading ICT industry, particularly in hardware - semi-conductors, mobile phones, TFT-LCD, and digital TV.

Given this impressive performance, Korea has become an interesting case for developing countries. A number of studies have tried to identify the factors behind the Korean success story<sup>60</sup>. There is a general consensus that a deliberate and targeted national development strategy aimed at transforming the structure of production, effective macroeconomic management and a commitment of the private sector, in particular on the part of *chaebols* (Korean conglomerates), to invest in technological development and innovation played a key role<sup>61</sup>.

The key policy elements of the country's development strategy can be summarized as follows. Korean economic development was based on the implementation of multiannual plans. From 1962 to 1992 the country carried out seven five-year economic development plans. The action plans had clear targets and associated budgets. Moreover, as targets were attained the government was gradually upgrading the objectives, which were set coherently with each other and proper sequencing of actions in the key fields was carried out. The key objectives of the five-year plans are presented in Table 1 below.

**Table 1. Key objectives of the five-year plans (1962-1996)**

Five-year economic development plan	Key objectives
1962-1966	Creation of domestic light industry, e.g. textiles, etc. Development of infrastructure: power plants
1967-1972	Building domestic heavy and chemical industries (HCI): steel, machinery, chemicals, shipbuilding, etc. Infrastructure development: construction of highways
1972-1976	Industrial restructuring: development of HCI and industrial complexes
1977-1981	Industrial restructuring: strengthening HCI (building a base for technological capabilities)
1982-1986	Comprehensive economic stabilization plan: increasing industrial competitiveness by opening up economy and rationalization
1987-1991	Regulatory and deregulatory reforms Supporting high-tech and innovative capacities
1992-1996	Revitalization of the economy Laying a basis for a balanced development of industrial sectors and SMEs

**Source:** "The Success of Korea's Catching up Strategy", from "Industrial Policy and Territorial Development. Lessons from Korea", OECD, 2012.

Together with the implementation of the programs, the country also provided targeted support to national industries through the provision of subsidized long-term credits and tax incentives, and establishing vocational schools for training the labor force, and through intervention in the

<sup>60</sup> For instance see: A. Amsten (1989), "Asia's Next Giant: South Korea and Late Industrialization", Oxford University Press, Oxford; M. Noland, H. Park (2003), "Industrial Policy in an Era of Globalization: Lessons from Asia", Institute for International Economics; World Bank (1993), "The East Asian Miracle: Economic Growth and Public Policy", Oxford University Press.

<sup>61</sup> OECD (2012), "The Success of Korea's Catching up Strategy", from "Industrial Policy and Territorial Development. Lessons from Korea".

domestic capital market. With regard to the latter, the government introduced a system of specialized banks that extended loans to specific industrial activities<sup>62</sup>.

Complementary to these, the country also employed export promotion and import restriction to support the development of their industries. The import control strategy lasted until the 1980s when the country started to liberalize its imports. Export promotion included three main components: a unitary fluctuating foreign exchange rate system, export credits and subsidies, and the establishment of free trade promotion export zones.

Most importantly, a shift to more technology-intensive production would be impossible without investments into human capital and R&D. In the early stages of the technological catch-up (in the 1960s), the government's focus was on training low-skilled technicians through vocational schools which were demanded by light industry, and, to a lesser extent, by rising heavy and chemical industries. With the development of the latter and other industries, the demand for an educated and skilled labor force increased. The government fostered training in priority areas - mechanical, electrical and chemical engineering. As a result, the number of graduates with master's and PhD degrees in these fields increased dramatically from 11,081 and 5,860, in 1983 to 20,459 and 17,662 in 1990, respectively.<sup>63</sup> Moreover, the share of graduates with doctorate degrees in the natural sciences and engineering increased from 26 percent in 1980 to 44 percent in 2011, including the number of advanced degrees obtained from leading Western universities<sup>64</sup>.

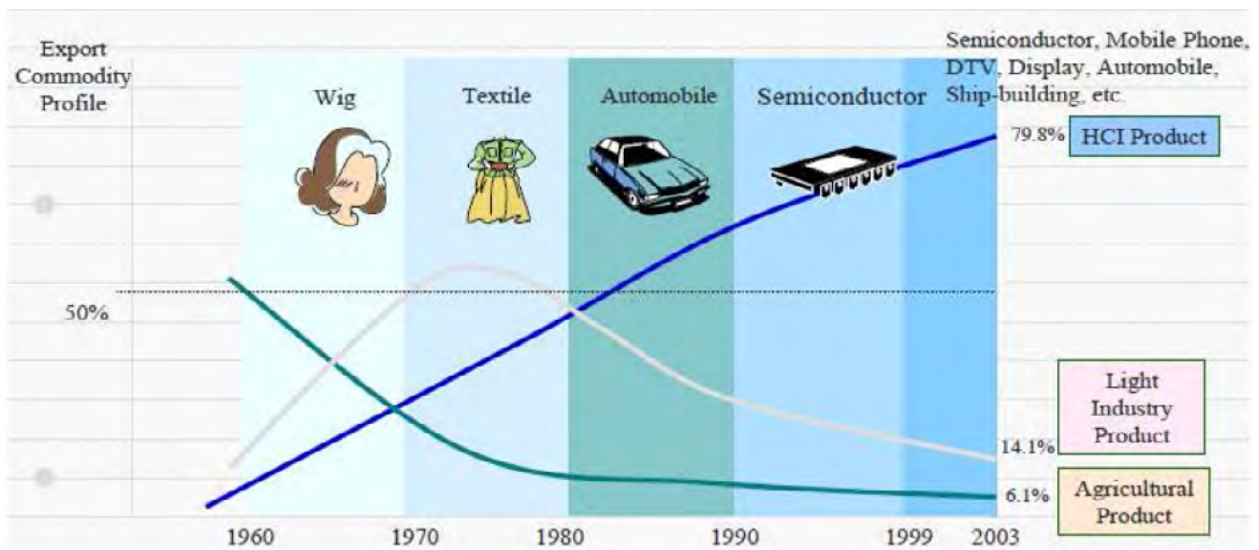
In view of increasing international competition, for the country to operate close to the technological frontier, apart from continuous investment into human capital and improvement in skills, substantial investments into R&D activities are crucial. Realizing this, the government together with *chaebols* and the private sector invested heavily in R&D. Currently, Korea is one of the leaders among OECD countries in terms of GDP share invested in R&D. In 2009, it invested 3.6% of GDP into R&D, whereas in the 1970s the share stood at 0.4 percent.

<sup>62</sup> The Government established the following banks: Korea Development Bank, Industrial Bank of Korea (1961), National Agricultural Co-operative Federation (1962), Kookmin Bank (1963), Korea Exchange Bank (1967), Korea Developing Financing Corporation (1967), Korea Trust Bank (1968), Housing and Commercial Bank (1969) and the Export Import Bank of Korea (1976). Later some of the banks were privatized.

<sup>63</sup> Ibid.

<sup>64</sup> Ibid.



**Figure 4. Changes in the Export Commodity Profile**

**Source:** “Strategy for Industrial Development and Growth of Major Industries in Korea”, Seung-Hun Chun, 2010

To summarize, Korea has made a remarkable technological leapfrog since the 1960s and drastically changed its production and export structure, starting as a producer of primitive products and currently producing high-tech goods, which are exported worldwide (Figure 4).

### Technological Development in the Baltic countries

More recent success stories of technological development are the Baltic countries. These countries may not be as industrially and technologically advanced as Japan and South Korea considered above, but they have definitely demonstrated some remarkable technological progress, particularly in their application of digital technologies in various socio and economic spheres. Their experience is worth consideration as these countries, like Kyrgyzstan and Tajikistan, used to be part of the Soviet Union and share some other similarities, e.g., relatively small population, literate population, etc.

The Baltic countries are recognized as some of the most economically stable IT outsourcing destinations in Europe. They boast high levels of digital solution adoption and effective legislation that ensures data security and smooth business operations<sup>65</sup>. Estonia is a leader among other Baltic countries in technological development. According to the Information and Computing Technology Development Index 2017, Estonia is 17th place out of 176 countries, whereas Lithuania is 41st.<sup>66</sup>

<sup>65</sup> <https://www.n-ix.com/it-outsourcing-destinations-estonia-latvia-lithuania/>

<sup>66</sup> <http://www.itu.int/net4/ITU-D/idi/2017/index.html>

## Estonia

Estonia, a small country with a population of 1.3 million people, ranks among the most digitally advanced societies in the world. The secret of the nation's rise to a digital powerhouse is in the pioneering advances made by its government under its innovative e-Estonia initiative, which fostered innovative education, virtual business and digital citizenship<sup>67</sup>.

Estonia is not rich in natural resources. Therefore, after its independence from the Soviet Union in 1991, the country decided that the online economy and massive technological innovation was the way forward. Given the country's small size and strong educational heritage Estonians were well suited to create new ways of doing things, including how to run a government<sup>68</sup>. The government then saw a future for Estonia as a tech-savvy, computer-driven society, thus focusing its resources on technology.

In 2000, Estonia became the first country in the world to declare internet access a basic human right. During the same year, it passed a law, which gave digital signatures equal power as hand-written ones. This was a vital move towards an entirely paperless system. As a result, no paper documents were needed any longer to pay taxes, open a bank account, obtain a mortgage, and carry out many other daily tasks, except for marrying and divorcing.

Since then Estonia has continued its innovation agenda. In 2007, it became the first country to allow online voting in a general election. It has one of the world's fastest broadband speeds and holds the record for start-ups per person. The New York Times called Tallinn, the capital of the country, "a sort of Silicon Valley on the Baltic Sea". For instance, Skype, the video communication program, is one of the most notable Estonian success stories. Citizens pay for parking spaces with their mobile phones and have their health records stored in a digital cloud.

Estonia has also been a leader in the "e-government" model. The premise of this approach is that government business can be conducted more efficiently, more sustainably, and more transparently if done online. As such, 95 percent of Estonians file their annual tax returns online.<sup>69</sup> Currently, Estonia is going to open the world's first "data embassy" in Luxembourg, which will store an entire backup of Estonia's data. The "data embassy" will enjoy the same sovereign rights as a regular embassy and will be able to reboot the country remotely, in the case of a (cyber) attack.

The digitalization of government services and the economy has helped to create a favorable business environment, attract foreign direct investments, bring modern technologies and foster economic development. Estonia claims its online systems lifts the country's GDP by 2 percentage points annually.<sup>70</sup>

Understanding how Estonia achieved such a success is not straightforward. There are several possible factors behind the country's technological innovation. After the country's independence from the Soviet Union, the government followed prudent macroeconomic policies that insured both internal and external economic stability and created favorable conditions for doing business in the country. In particular, in 1994 it introduced a flat-income tax system, free trade and made the registration of new businesses smooth and without delays.

<sup>67</sup> Mari Roonemaa (2017), "Global lessons from Estonia's tech-savvy government"

<sup>68</sup> Daniel Vaarik, "Where Stuff Happens First", White Paper on Estonia's Digital Ideology

<sup>69</sup> Kristjan Vassil (2016), "Estonian e-Government Ecosystem: Foundation, Applications, Outcomes", World development report

<sup>70</sup> Vivienne Walt (2017), "Is This Tiny European Nation a Preview of Our Tech Future?"

Moreover, Estonia enjoyed a relatively smooth and peaceful democratic transition, unlike many other post-Soviet states. This was possible largely due to the absence of severe political and ideological divisions in Estonia<sup>71</sup>, which enabled reformers both in the public and private sector to operate without excessive political conflict. Successive governments, the private sector, academic institutions and citizens have all backed e-Estonia since the early 1990s when it was launched.

On the education front, the country has paid a lot of attention to this sector. Estonia's successes in educational policy, including math and science achievements, were recognized in a recent article entitled "Is Estonia the New Finland?"<sup>72</sup> For instance, the country was first to teach HTML coding in its elementary schools in 2012.

Finally, it is also argued that the country's innovation has led to more innovations. The government is not afraid to take chances with new things and receives understanding and support from its citizens.

## Lithuania

Research and technology development as well as the creation of new markets for high-tech products is identified by the government of Lithuania as one of the key technological and economic development priorities of the country.

The country has adopted and been successful at implementing the following programs and policies aimed at innovation and technological development:

1. High technology development program
2. Long-term strategy for research and development
3. Development of research and technology parks
4. The Lithuanian innovation strategy for the period 2010—2020
5. Information society development for the period 2014–2020.

These programs are aimed to boost development in the areas of biotechnology, mechatronics, laser technologies, information technology, nanotechnology, electronics and e-governance. With regard to the latter, the government has been working to increase the scope of e-services and to enhance their quality by adopting digital technologies. To ensure efficient development of these sectors the country has been developing its high-speed broadband communication infrastructure.

The country has made remarkable progress in the above-mentioned fields. Lithuania has a leading position in the field of biotechnology in Central and Eastern Europe. For example, CJSC "Fermentas" is among the five largest companies in the world, and is a market leader in DNA markers in Europe. The medico-pharmaceutical valley, Santariškės Visoriai, the first such kind in the Baltics was founded in Vilnius in 2007. Apart from this, there are 15 biotechnological research centers in Lithuania that have demonstrated solid achievements in the chemical and biochemical research of proteins, enzymes and nucleic acids for the pharmaceutical industry, as well as in molecular research of prokaryotic and eukaryotic cells.

<sup>71</sup> Kristjan Vassil (2016), "Estonian e-Government Ecosystem: Foundation, Applications, Outcomes", World development report

<sup>72</sup> Ibid.

The country takes one of the world's leading positions in the development and production of special purpose laser technologies. In particular, it holds 50 percent of the global market for high-energy picosecond lasers, and 80 percent of the world's production of ultrafast optical parametric oscillators<sup>73</sup>. Currently, there are more than 10 laser technology companies in Lithuania, which export their products to approximately 100 countries around the world.

Obviously, these results will not have been possible without highly qualified and educated professionals in place. The country pays a great deal of attention to the preparation of such specialists, especially in the engineering, IT and related fields. Lithuanian IT education received a 50 percent increase in government funding for IT studies in 2016, which stimulated 43 percent growth among students choosing IT as their first choice study field.<sup>74</sup> As a result, Lithuania ranks first among all EU countries in training highly qualified specialists in the field of information technology on a per capita basis. More than 27,000 specialists are employed in the ICT industry in Lithuania, with an additional 1,700 future experts graduating every year according to Invest Lithuania<sup>75</sup>. The availability of highly qualified specialists and government policies encouraging research and development (R&D) in the country has led to the establishment of R&D centers by leading high-tech companies with the ensuing inflow of foreign direct investment. For example, global companies such as Google, AIG, Nasdaq, Uber, IBM, Wix, HP, Virtustream, Exadel, and Unity have already opened their R&D and IT development centers in the country. In 2015, IT companies in Lithuania received more than \$100 million in investment, which stimulated the growth and development of the IT and related sectors.

## 6. Digital Economy Perspectives

Nowadays, there is a general agreement that digital technologies, if applied properly, can significantly contribute to the economic development of any country. The most important digital dividends are realized through the contribution to growth, jobs and services. In a nutshell, digital technologies help: businesses become more productive, increase trade and competitiveness, people find jobs, strengthen financial inclusiveness, and the government deliver better public services<sup>76</sup>. The latter is especially important for developing countries confronting issues of institutional weaknesses and requiring a technological shift in the state sector. Digitalization of government services (as already discussed above in the case of Estonia) is generally conducive to the corruption reduction (Figure 5). It is also argued that a high level of ICT penetration and adoption in both the private and public sector, including e-government, has a positive effect on competitiveness (Figures 6).

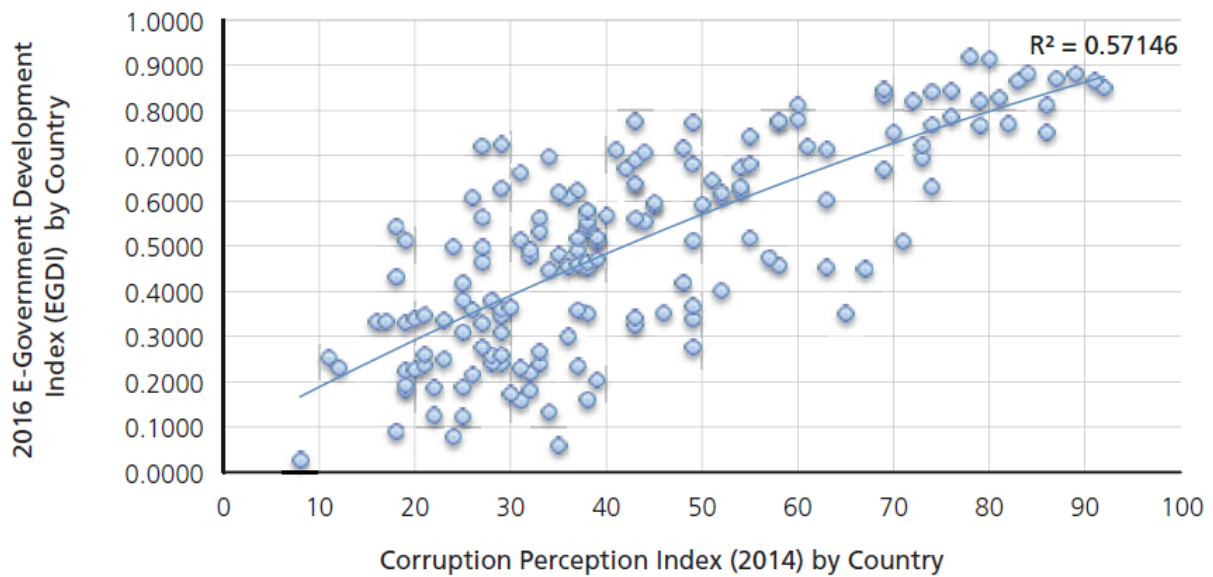
<sup>73</sup> Yuri M. Zverev, Irina A. Batorshina, Maxim Ye. Megem. "The Research and Technology Development in Lithuania and the Prospects of Research and Technology Cooperation between Lithuania and the Russian Federation". Available at [https://journals.kantiana.ru/upload/iblock/26d/Yuri%20M.%20Zverev\\_49-55.pdf](https://journals.kantiana.ru/upload/iblock/26d/Yuri%20M.%20Zverev_49-55.pdf)

<sup>74</sup> <https://www.n-ix.com/it-outsourcing-destinations-estonia-latvia-lithuania/>

<sup>75</sup> Top IT Outsourcing Destinations of Eastern Europe: Market Report. Available at: <https://www.n-ix.com/it-outsourcing-destinations-eastern-europe-market-report/>

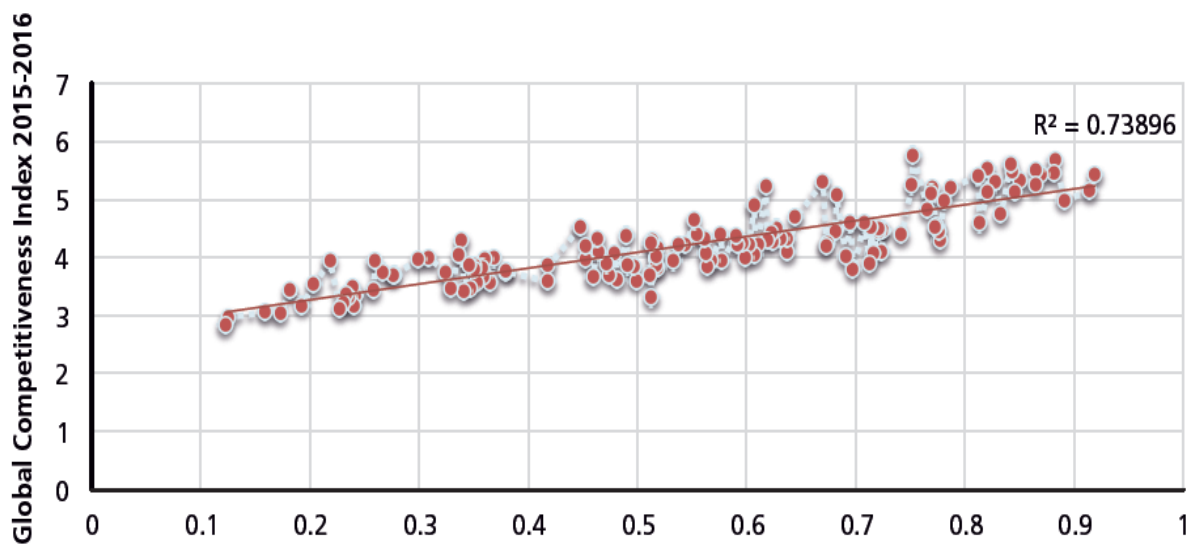
<sup>76</sup> For a more detailed discussion of the digital benefits, for instance, see World Bank (2016), "World Development Report: Digital Dividends".

**Figure 5. Correlation of e-Government Development Index (EGDI) and the Corruption Perception Index (CPI)**



Source: United Nations' E-Government Survey 2016

**Figure 6. Correlation of E-Government Development Index (EGDI) and Global Competitiveness**

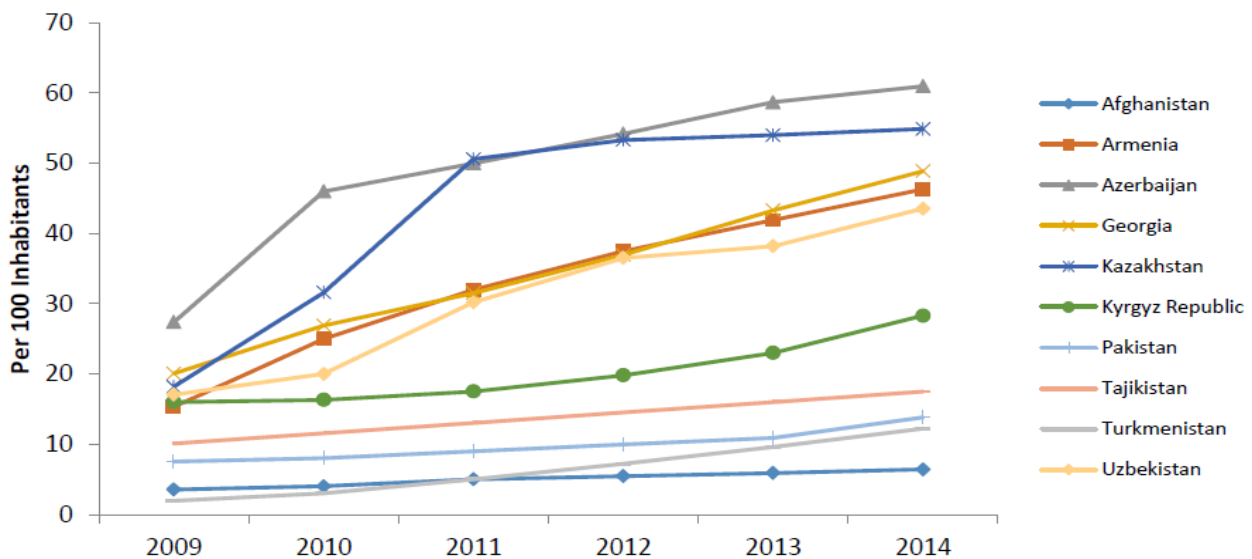


Source: United Nations' E-Government Survey 2016

So, where do Kyrgyzstan, Tajikistan and Afghanistan stand in their digital economy agenda? All of them, to some extent, have economy digitalization on their development agenda. However, there are a number of significant challenges that these countries have encountered or will encounter in the process of switching from a basic internet economy to a digital economy and society. In this regard, it would be worthwhile examining the communication infrastructure and internet access in these countries.

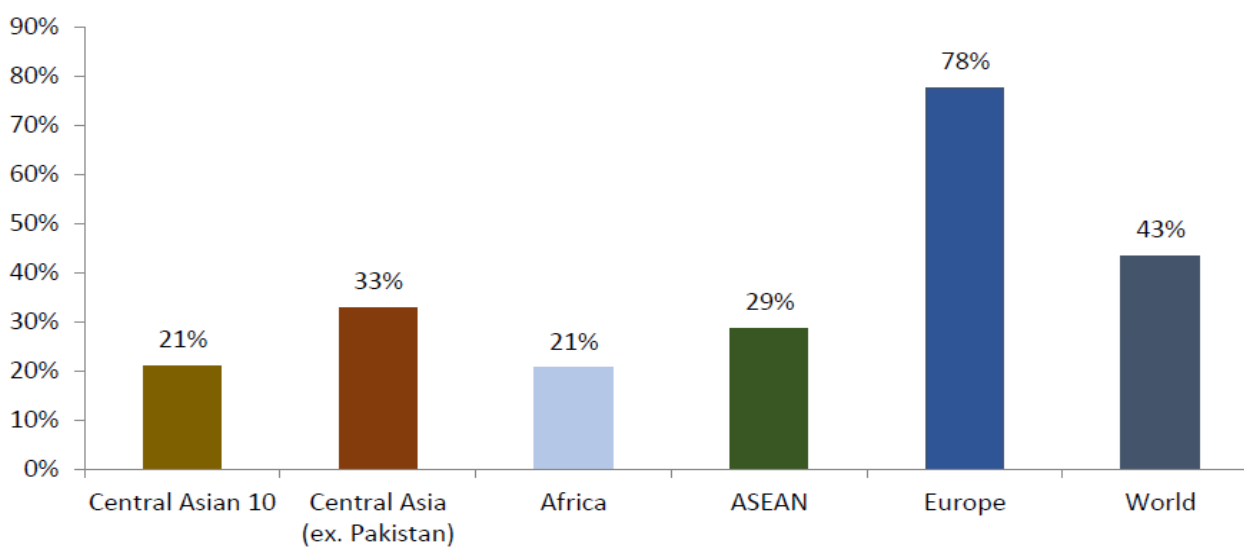
Despite the increasing internet penetration in the countries under review (Figure 7), it remains relatively low compared to that of more advanced economies and even lower than the global average (Figure 8). There are a number of socio-economic and demographical factors behind this and include, among other things, the majority of the population living in rural areas, relatively low population density and difficult geography. These make the coverage by physical networks 'uneconomic'. At the same time, the comparatively young populations of these countries, who are likely to be the early adopters of digital technologies, and low levels of connectivity imply that there is a room for growth.

**Figure 7. Internet Penetration per 100 Inhabitants (2009-2014)**



Source: ADB (2015), "Unleashing the Potential of the Internet in Central Asia, South Asia, the Caucasus and Beyond"

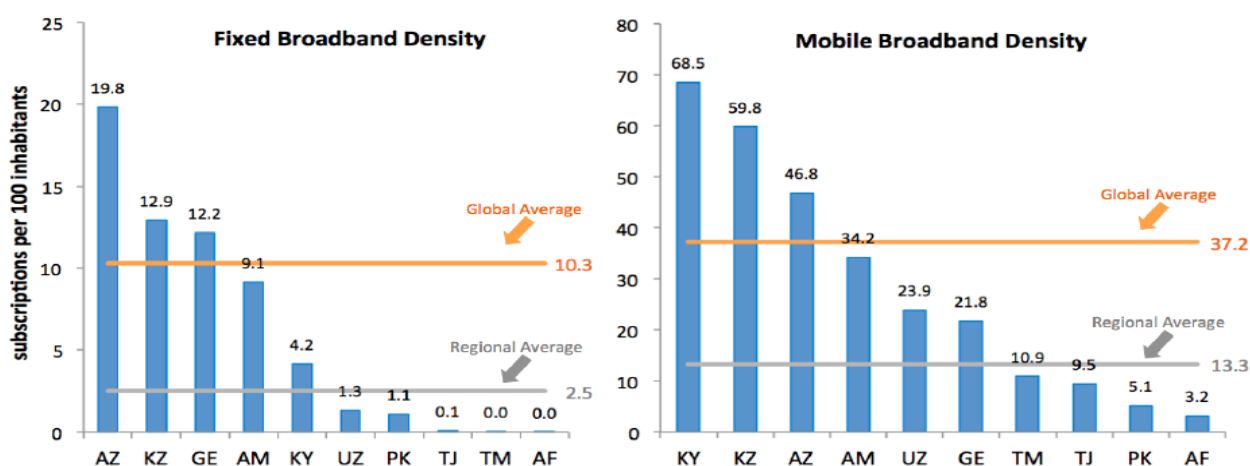
**Figure 8. Subregional Comparison of Internet Penetration**



Source: ADB (2015), "Unleashing the Potential of the Internet in Central Asia, South Asia, the Caucasus and Beyond"

Broadband penetration, both fixed line and mobile, are now more commonly used as measures of communication infrastructure and Internet access. In 2014, the countries also lagged behind the world average in terms of fixed broadband penetration, whereas Kyrgyzstan performed above the global average as for mobile band density, while Tajikistan and Afghanistan were even below the regional average (Figure 9).

**Figure 9. Broadband Penetration per 100 Inhabitants (2014)**



Source: ADB (2015), "Unleashing the Potential of the Internet in Central Asia, South Asia, the Caucasus and Beyond"

As for international bandwidth and its affordability, the countries perform poorly mainly due to their landlocked geographies. There is no access to submarine cables and only terrestrial landline cables supply international bandwidth. Therefore, the countries continue to pay higher prices and use relatively low international bandwidth.

To summarize, despite some improvements in telecommunication infrastructure and internet access the countries still lag behind the global averages. There is a lot to be done in this area if the countries are to reap the benefits from digitalization as adequate telecommunication and internet infrastructure provide greater business development opportunities (cloud computing, e-commerce, opportunities for innovation and expansion).

## 7. Conclusion and policy recommendations

The paper has examined the macroeconomic management frameworks in Kyrgyzstan, Tajikistan and Afghanistan. Overall, the countries tend to follow relatively prudent macroeconomic policies. However, their economies continue to be highly vulnerable to both external and internal (to a higher extent applicable to Afghanistan) shocks. The structures of the economies remain relatively simple, with the countries under review producing low-valued added goods. Therefore, in terms of macroeconomic management, it is highly desirable that they run prudent macroeconomic and fiscal policies ensuring both external and internal stability as well as reducing external vulnerabilities. Without these, it would be extremely difficult for the countries to jump on the technological development path.

In the context of technological development, the experiences of Japan, South Korea, and the Baltic countries considered in the paper, show that along with prudent macroeconomic policies the countries under review should pay more attention to:

- (i) improving the quality of secondary and higher education, and encouraging young people to obtain education in natural sciences, engineering as well as information and computing technologies;
- (ii) improving governance, strengthening the rule of law and reducing corruption, as these are all crucial for a favorable investment climate and ensuing foreign investments and modern technologies;
- (iii) building appropriate infrastructure, including telecommunication and internet access that would allow greater investments, an increase in financial inclusiveness and the benefits of digitalization to be enjoyed.

Although the countries have development programs, most of the time, there is no association between the activities under the program and the budgets. In this respect, the experience of South Korea in the planning and sequencing of activities could be useful.

Finally, the governments could also intervene by 'picking the winner' and supporting viable sectors of the economy through different mechanisms discussed above. For instance, Tajikistan and Kyrgyzstan may expand and modernize existing sectors, such as mining, agriculture and energy, and focus on the development of higher-value added processing industries based on these sectors: ore processing and metallurgy, food processing and textiles, chemical and machine building (based on mining), own brand apparel manufacturing and organic food products. As for Afghanistan, processing industries should be built from scratch together with the development of core industries, such as mining, agriculture and energy.



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## Annexes

**Table A 1. Remittances received (% of GDP)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2008	2.8	23.8	49.3
2009	1.2	20.9	35.1
2010	2.1	26.4	35.8
2011	1.0	27.6	41.7
2012	1.2	30.8	42.2
2013	1.6	31.1	43.5
2014	1.3	30.0	36.6
2015	1.5	25.3	28.8
2016	2.2	30.4	26.9

Source: World Development Indicators, World Bank

**Table A 2. GDP growth rates (%)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	8.4	-0.5	6.5
2011	7.3	6.0	7.4
2012	11.4	-0.1	7.5
2013	3.9	10.9	7.4
2014	1.3	4.0	6.7
2015	0.8	3.9	6
2016	2.0	3.8	6.9

Source: Asian Development Outlook 2017

**Table A 3. GDP per capita (current US dollars)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	553.3	880.0	738.3
2011	603.5	1 123.9	834.5
2012	669.0	1 178.0	954.7
2013	631.7	1 282.4	1 040.2
2014	612.1	1 279.8	1 104.5
2015	569.6	1 121.1	918.7
2016	561.8	1 077.0	795.8

Source: World Development Indicators, World Bank

**Table A 4. Inflation (%)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	0.9	8.0	6.4
2011	10.2	16.5	12.4
2012	7.2	2.7	5.8
2013	7.7	6.6	5.0
2014	4.6	7.5	6.1
2015	-1.5	6.5	5.7
2016	2.2	0.4	6.0

Source: World Development Indicators, World Bank

**Table A 5. Budget balance (% of GDP)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	0.9	-4.9	0.4
2011	-0.6	-4.8	0.8
2012	1.1	-5.5	0.1
2013	-0.6	-5.3	-1.3
2014	-1.7	0.8	-0.6
2015	-1.4	-1.5	-2.3
2016	1.6	-4.6	-1.7

Source: Asian Development Outlook, National Bank of Tajikistan, National Bank of the Kyrgyz Republic

**Table A 6. Nominal exchange rate (local currency per US dollars)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	46.5	46.0	4.4
2011	46.7	46.1	4.6
2012	50.9	47.0	4.7
2013	55.4	48.4	4.8
2014	57.2	53.7	4.9
2015	61.1	64.5	6.2
2016	67.9	69.9	7.8

Source: World Development Indicators, World Bank

**Table A 7. Loan dollarization, %**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	73.1	55.8	48.9
2011	76.5	55.3	55.5
2012	75.4	53.7	59.6
2013	75.9	53.6	59.5
2014	67.4	57.6	60.1
2015	67.0	55.1	63.1
2016	61.0	44.5	61.6

Source: IMF Article IV, National Bank of Tajikistan, National Bank of the Kyrgyz Republic

**Table A 8. Deposit dollarization, %**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	65.5	52.1	57.8
2011	66.6	50.1	63.2
2012	71.4	46.8	67.3
2013	69.0	48.8	68.3
2014	65.8	56.3	65.5
2015	68.8	65.6	69.5
2016	66.2	51.0	62.4

Source: IMF Article IV, National Bank of Tajikistan, National Bank of the Kyrgyz Republic

**Table A 9. Total loan growth, %**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	n/a	4.6	-31.6
2011	n/a	18.3	28.7
2012	n/a	28.5	13.0
2013	n/a	34.5	38.9
2014	n/a	45.9	29.9
2015	n/a	19.3	15.9
2016	n/a	-0.5	-12.4

Source: National Bank of Tajikistan, National Bank of the Kyrgyz Republic

Notes: n/a – not available

**Table A 10. Total deposit growth, %**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	n/a	-14.0	23.8
2011	n/a	13.5	35.3
2012	n/a	31.0	11.4
2013	n/a	32.9	12.1
2014	n/a	22.6	21.2
2015	n/a	24.6	28.7
2016	n/a	4.1	7.3

Source: National Bank of Tajikistan, National Bank of the Kyrgyz Republic

Notes: n/a – not available

**Table A 11. Average interest rate on loans issued (local currency), %**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	n/a	23.7	23.4
2011	n/a	23.8	22.5
2012	n/a	23.0	21.1
2013	n/a	21.3	24.3
2014	n/a	20.1	24.4
2015	n/a	23.6	25.4
2016	n/a	24.5	25.6

Source: National Bank of Tajikistan, National Bank of the Kyrgyz Republic

Notes: n/a – not available

**Table A 12. Average interest rate on loans issued (foreign currency), %**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	n/a	19.8	23.0
2011	n/a	19.6	21.9
2012	n/a	19.1	24.5
2013	n/a	17.7	24.4
2014	n/a	15.0	23.1
2015	n/a	14.3	21.5
2016	n/a	12.5	19.9

Source: National Bank of Tajikistan, National Bank of the Kyrgyz Republic

Notes: n/a – not available

**Table A 13. Average interest rate on deposits (local currency), %**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	n/a	2.0	1.1
2011	n/a	2.2	1.0
2012	n/a	2.3	0.6
2013	n/a	2.3	0.5
2014	n/a	2.5	0.4
2015	n/a	2.5	0.5
2016	n/a	2.4	0.6

Source: National Bank of Tajikistan, National Bank of the Kyrgyz Republic

Notes: n/a – not available

**Table A 14. Average interest rate on deposits (foreign currency), %**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	n/a	1.1	1.4
2011	n/a	0.8	1.4
2012	n/a	0.8	1.5
2013	n/a	0.8	1.5
2014	n/a	0.9	1.5
2015	n/a	1.1	1.0
2016	n/a	0.6	0.8

Source: National Bank of Tajikistan, National Bank of the Kyrgyz Republic

Notes: n/a – not available

**Table A 15. Exports of goods and services (bln US dollars)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	1.6	2.47	0.87
2011	1.1	3.38	1.16
2012	1.13	2.93	1.64
2013	1.26	3.1	1.63
2014	1.32	2.8	0.84
2015	1.35	2.35	0.82
2016	1.34	2.41	0.92

Source: World Development Indicators, World Bank

**Table A 16. Imports of goods and services (bln US dollars)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	7.16	3.92	2.97
2011	7.92	5.06	4.38
2012	8.04	6.29	5.27
2013	9.97	6.73	5.81
2014	9.18	6.55	4.14
2015	9.38	5.06	3.32
2016	9.54	4.71	2.97

Source: World Development Indicators, World Bank

**Table A 17. Corruption perception index (0=very corrupt; 100=very clean)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	1.4	2	2.1
2011	1.5	2.1	2.3
2012	8	24	22
2013	8	24	22
2014	12	27	23
2015	11	28	26
2016	15	28	25

Source: [www.transparency.org](http://www.transparency.org)

**Table A 18. Ease of doing business index (1=most business-friendly regulations)**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	154	67	152
2011	160	70	147
2012	168	70	141
2013	164	68	143
2014	183	102	166
2015	182	73	130
2016	183	75	128

Source: World Bank

**Table A 19. Gross international reserves (blns. US dollars)**

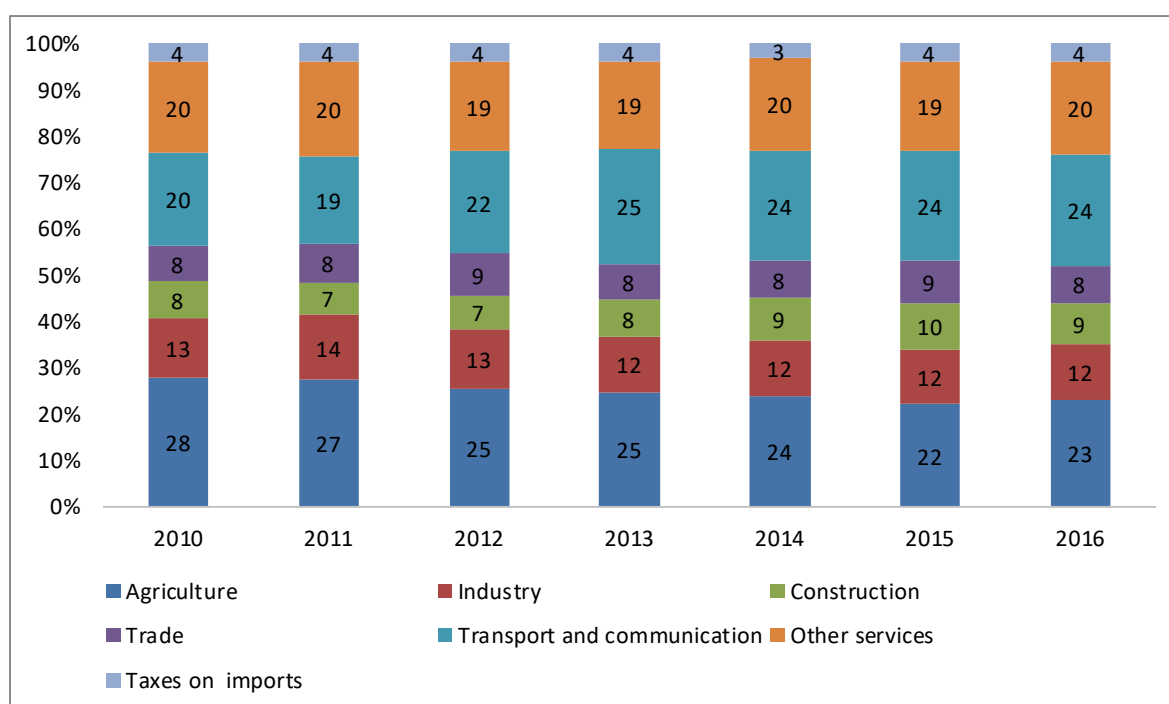
Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	5.2	1.7	0.4
2011	6.3	1.8	0.5
2012	7.2	2.1	0.6
2013	7.3	2.2	0.7
2014	7.5	2.0	0.5
2015	7.0	1.8	0.5
2016	7.3	2.0	0.6

Source: World Bank

**Table A 20. Total government debt, % of GDP**

Year	Afghanistan	Kyrgyzstan	Tajikistan
2010	8.0	49.6	36.8
2011	6.9	30.6	35.9
2012	6.3	37.7	32.4
2013	6.9	30.6	29.1
2014	6.4	52.8	27.5
2015	9.3	68.3	34.3
2016	8.3	62.0	41.8

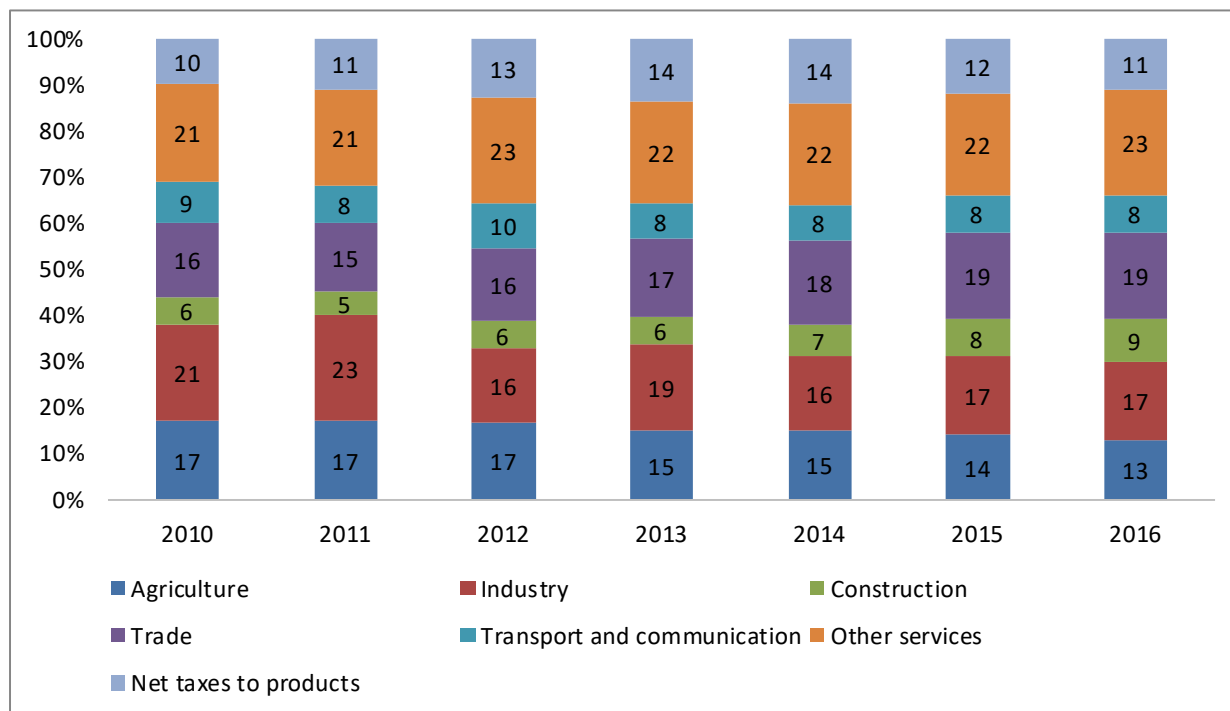
Source: IMF Article IV, World Economic Outlook, Ministry of Finance of the Kyrgyz Republic

**Figure A 1. GDP composition of Islamic Republic of Afghanistan by sectors**

Source: National Statistical Committee of Islamic Republic of Afghanistan

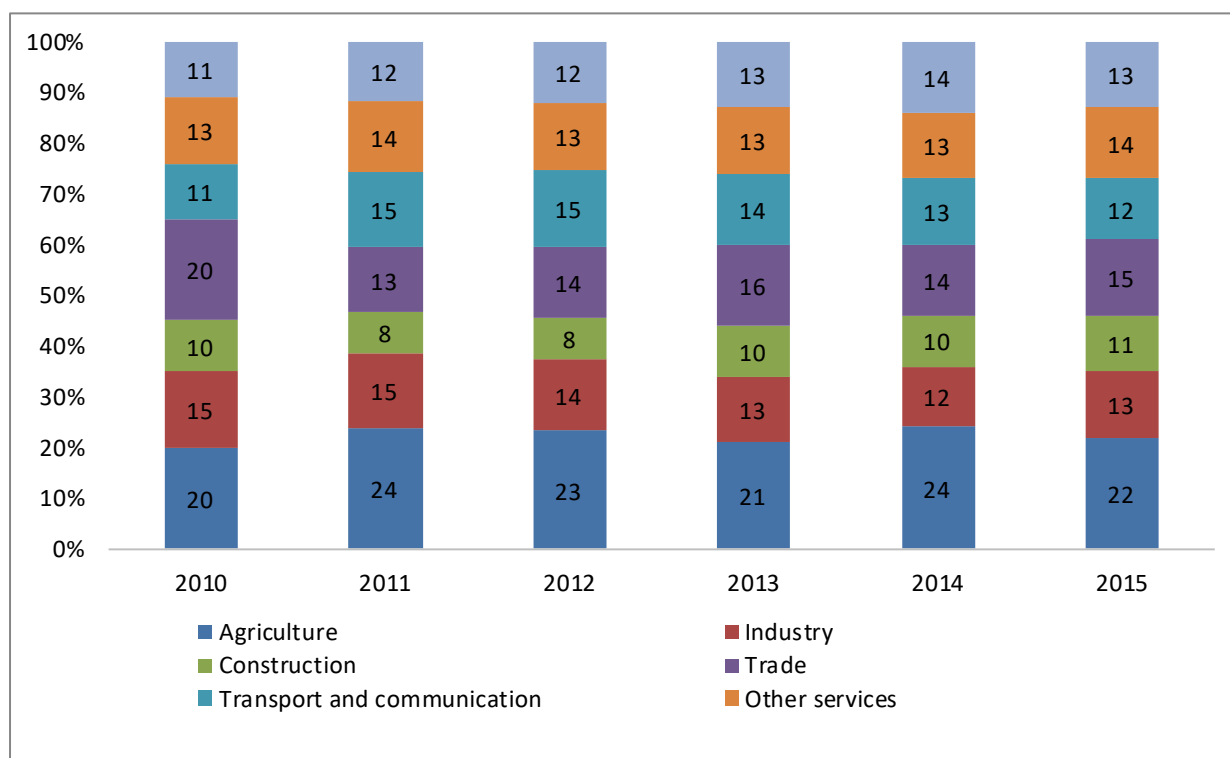


Figure A 2. GDP composition of the Kyrgyz Republic by sectors



Source: National Statistical Committee of the Kyrgyz Republic

Figure A 3. GDP composition of Tajikistan by sectors



Source: National Statistical Committee of Tajikistan