

Working paper

Industrial Development of Kyrgyzstan: Background

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Industrial Development of Kyrgyzstan: Background

1. Introduction

Kyrgyzstan is a landlocked, mountainous country located in the Eastern part of Central Asia. With a population of 6.1 million, it is a small and open economy with a limited resource base. Only 7% of Kyrgyzstan's land is arable (World Bank, 2018); more than 50% of the area lies at altitudes between 1,000 and 3,000 meters, and another 30% lies at altitudes higher than 3,000 meters above sea-level (World Bank, 2018).

After the collapse of the Soviet Union in 1991 and the subsequent turn into an independent democratic state with a mixed presidential-parliamentary political system, Kyrgyzstan experienced drastic economic transformations. The abrupt liberalization of the economy, the loss of fiscal transfers from the Soviet Union, and the disruption of trade flows between individual republics, among other factors, led to a massive economic downturn and impoverishment of population (UNIDO, 2018). The economic development of Kyrgyzstan in the post-Soviet era was also repeatedly shocked by political turbulences such as those in 2005 or 2010.

In the aftermath of independence, Kyrgyzstan experienced a long-lasting and deep recession practically leading to an almost complete erosion of its industrial base. However, a steady growth path observed since the early 2000s, allowed the country to regain its 1991 GDP per capita level in 2011 (Figure 1). Moreover, it has recently graduated from a low to lower-middle income group (LMIC) according to the World Bank classification (Choi, Portugal Perez, & Myburgh, 2014). Despite this positive performance, Kyrgyzstan remains the second poorest country in Central Asia after Tajikistan. The strong dependence of the Kyrgyz economy on three major but highly volatile sources of income namely, the exploitation of natural resources, remittances and foreign aid and loans, places it in a very vulnerable position relative to external shocks.

Economic growth in the last decade has been driven mainly by the service sector, including trade, while the contribution of the industrial sector has been rather fluctuating given the strong presence of natural resource processing activities (see Figure 2). This growth has been insufficient to facilitate the creation of a significant and thriving middle class with secure income sources sufficient to cover the family's living costs and decent living standards, including education and social security. Rather, the majority of population remains in poorly paid, low productivity jobs. Income distribution is remarkably balanced in the Kyrgyz society: Kyrgyzstan ranks among the top-5 countries in the world by Gini index according to World Bank data, although living standards are relatively low.

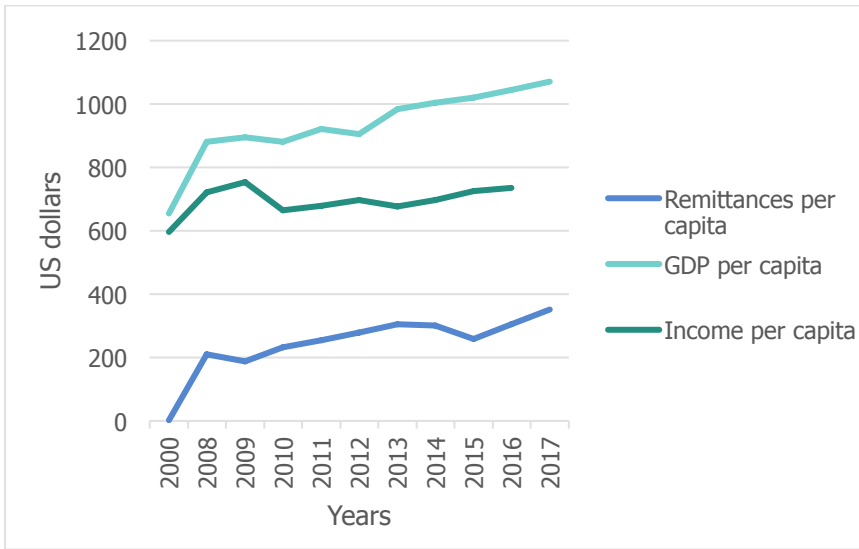


Figure 1. GDP, income and remittances per capita (in 2010 constant prices). Source: (World Bank, 2018), (National Statistical Committee of the Kyrgyz Republic, 2018) and own calculation.

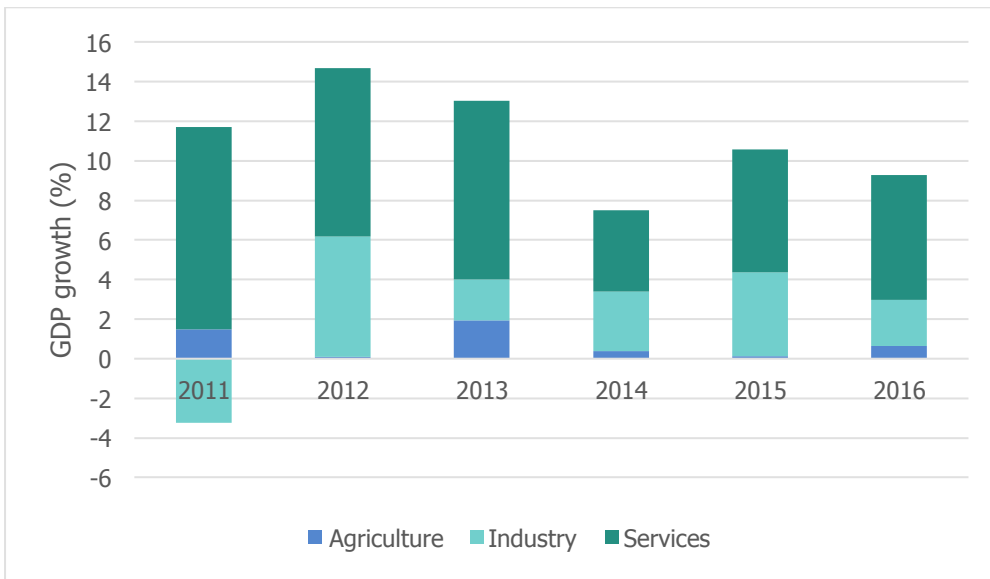


Figure 2. Sector contributions to growth in Kyrgyzstan, 2011-2016. Source: (National Statistical Committee of the Kyrgyz Republic, 2018) and own calculation.

About 70% of the work force are involved in informal or non-observed economic activities, creating only about 28% of the total value added (UNIDO, 2018). Pervasive informality across all key Kyrgyz sectors, such as agriculture, trade, and light industry, results in significant barriers to productivity growth, and hinders the attainment of minimum efficient production scales (UNIDO, 2018), while tax evasion reduces the state budget income. Moreover, despite very positive dynamics over the last fifteen years, practically having eliminated extreme poverty, the current absolute national poverty level (measured at national poverty line) is around

30% (World Bank, 2018). The share of population living on less than USD 3.1 per day declined significantly from 75% in 2000 to 19% in 2009, with no significant progress since then. The unemployment rate is high among young people with a markedly higher rate for women (UNIDO, 2018).

Immigration for economic reasons remains high, remittances constitute a significant source of income for those that stay back home; presently, remittances flows account for about 25% of GDP, putting into question the ability to translate past growth into an ability to generate enough decent jobs (UNIDO, 2018).

Kyrgyzstan is rich in mineral resources, but has negligible oil and natural gas, which it imports. Among its mineral reserves, there are substantial deposits of coal, gold, uranium, antimony, and other valuable metals.

Kyrgyzstan is located upstream of several big rivers of Central Asia (Naryn, At-Bashi, Talas, Chu, etc.), which is why water is one of its most important natural resources. Also, it is well endowed with water from mountaintop snow and glaciers.

The economy largely relies on environmental services, yet the state of the natural capital is deteriorating. Problems include abandoned uranium mines, hazardous waste deposits located in areas prone to mudflows and landslides. Moreover, extensive mining puts glaciers, an important source of water in the region, at risk.

Rapid and environmentally sustainable economic growth should be the foremost priority for Kyrgyzstan.

Manufacturing usually acts as the engine of growth in developing countries (UNIDO, 2018). There is an empirical correlation between the degree of industrialization and per capita income in these countries. Existing evidence from countries that embarked on a steep and sustained growth trajectory suggest that their growth has been primarily based on an expanding and internationally competitive manufacturing sector (UNIDO, 2018). In fact, all historical examples of success in economic development and catch up since 1870 have been associated with successful industrialization (Szirmai, 2008). A prominent recent example is the experience of the East Asian countries (Szirmai & Verspagen, 2015), which developed very rapidly in the last fifty years.

At the same time, it is now argued that service sectors, especially business-related ones such as software, business processing, finance or tourism, may act as leading development sectors, while the role of manufacturing is declining; India, since the 1990s, being a prominent example of such a development (Szirmai & Verspagen, 2015).

Services and manufacturing are of course intimately interconnected. Their symbiotic relationships through the input-output structure of the economy generate multiplier effects (Ariu, Breinlich, Corcos, & Mion, 2017). Strengthening the manufacturing-services nexus entails new opportunities for developing countries because strong backward and forward linkages of many manufacturing industries bring about spillovers to other parts of the economy such as business-related services (UNIDO, 2018).

Diversification, complex supply and value chains are the fundament for a continuous economic growth (ADB, 2018; UNIDO, 2018). Kyrgyzstan must build on current strengths and competitive advantages to strive to enlarge and diversify its manufacturing base and to integrate into regional and global economic networks. In doing so, the country should not compromise environmental quality, and preserve its natural capital for the benefit of future generations. These objectives can be achieved through adoption of more efficient, environmentally friendly and less resource-intensive production technologies.

2. Overview of the current economic situation, industrial development and trade in Kyrgyzstan

The nominal gross domestic product (GDP) of Kyrgyzstan in 2017 was 7.6 billion US dollars (in constant 2010 prices); the annual GDP growth rate average over the last five years was 5.5% (in 2017 4.6%) (World Bank, 2018).

Kyrgyzstan records a negative trade balance (World Bank, 2018); a particularly sizable disparity is observed in trade with China. While import levels are relatively low, they are growing fast as domestic demand is artificially enhanced by the inflow of foreign aid and loans.

The Kyrgyz industrial sector includes five types of economic activity according to classification of the National Statistical Committee of the Kyrgyz Republic:

- Mining;
- Manufacturing;
- Electricity, gas and steam production, distribution and supply;
- Water supply, waste treatment and disposal; and
- Construction.

The overall weight of the industrial sector relative to GDP was 26% in 2017 (see Figure 3). The most important manufacturing activities include basic metal and finished metal products (mainly gold), food and tobacco production, and rubber, plastic and other non-metal products, coke and refined petroleum products, and textile, cloths, footwear and leather (see Figure 4).

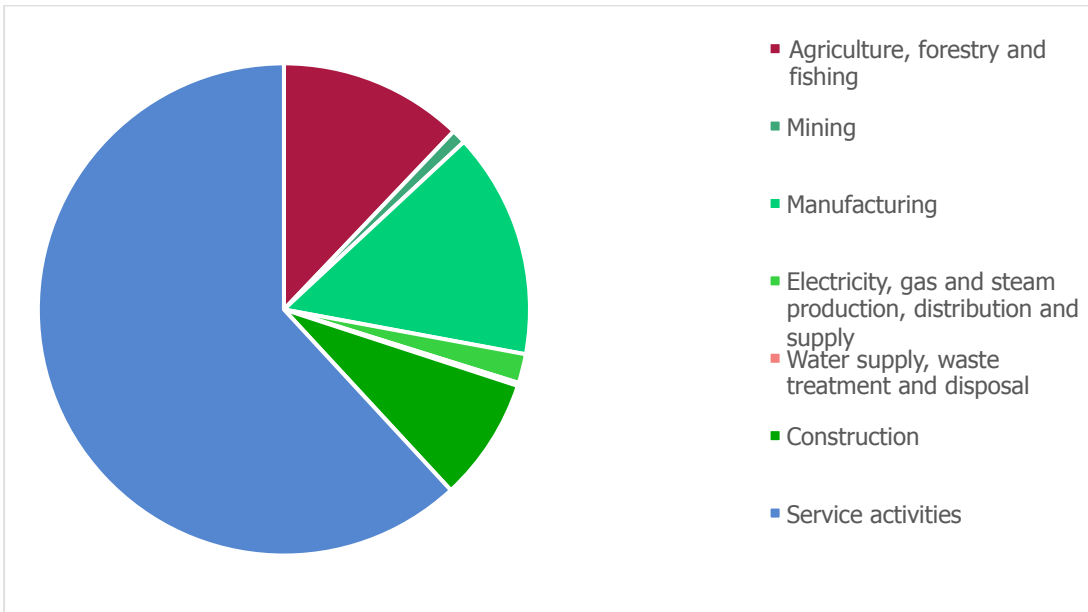


Figure 3. Kyrgyzstan's GDP in 2017 by major sectors; the industrial sector (green) is further split into Mining; Manufacturing; Electricity, gas and steam production, distribution and supply; Water supply, waste treatment and disposal; and Construction (in current prices; billion som). Source: (National Statistical Committee of the Kyrgyz Republic, 2018).

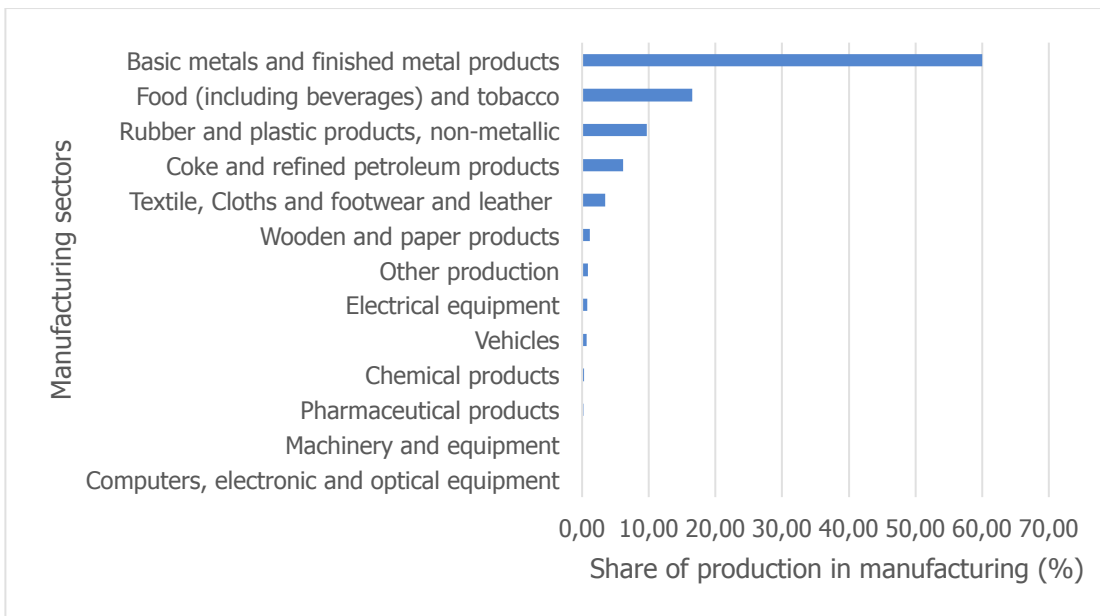


Figure 4. Contribution of each manufacturing sector to the overall manufacturing production (2017). Source: (National Statistical Committee of the Kyrgyz Republic, 2018).

Kyrgyzstan's economy depends heavily on gold mining, and more specifically the Kumtor Gold Mine, the fifth largest open pit gold mine worldwide. This situation introduces at least four major challenges. Dependence on

the performance of a single enterprise implies a high risk exposure to extraction rates and global commodity prices which finally traduce in significant volatility in GDP growth, while the tendency to drastically simplify the structure of the national economy reduces opportunities to tap into higher multiplier effects. In addition, the mining sector generates fewer jobs per unit of output (in Kyrgyzstan only about 3,000 people are employed in the mining sector; (Manley & Kulova, 2018) than most other traditional sectors and increases the burden on the natural environment.

A significant component of national income stems from remittances coming from labor migrants working in Russia, the United States and Kazakhstan. Over 800,000 Kyrgyz migrant workers work abroad, of which 80% in Russia, 4.4% in Kazakhstan, 3.8% in Turkey, 2.5% in the US, 1.8% in Turkey and the remaining 7.5% in other countries. The annual volume of remittances constitutes approximately 35% of Kyrgyzstan's GDP (Kabar, 2018). The amount of funds transferred in 2017 by labor migrants was 2.21 billion US dollars, 27% more than in 2016, and 5% more than in 2013; in 2018 the growing trend continues (Kabar, 2018). According to the Asian Development Bank, the inflow of remittances should continue to increase due to a revival of Russia's economy and more favorable conditions for Kyrgyz labor migrants in Russia due to its membership in the Eurasian Economic Union (EAEU) (Achkar, 2018).

Re-export of products of Chinese origin to Russia and Central Asian countries has contributed significantly to the dynamism of the Kyrgyz economy. A large share of Kyrgyzstan's garment exports to Kazakhstan and Uzbekistan are in fact due to re-export. Future prospects of the re-export business are uncertain as the transition period for the Kyrgyz textile sector to adopt the external EAEU tariff draws close to an end. Several other key export items, while not re-exports in a strict sense, also rely exclusively on foreign inputs. For example, crude oil is imported from neighboring Kazakhstan, refined by Chinese-controlled refineries in Kyrgyzstan and then partly exported, partly consumed domestically.

Kyrgyzstan has a very weak financial system being also largely a cash-based economy. It struggles with a lack of trust in the Kyrgyz Som as evidenced by the country's high degree of dollarization. The Government of Kyrgyzstan faces the twin objective to maintain macroeconomic stability and to foster favorable conditions for industrialization and external competitiveness. The country follows a largely standard liberal approach in line with recommendations of the IMF. Accordingly, the National Bank of the Kyrgyz Republic (NBKR) has committed to an inflation-rate targeting regime with a floating exchange rate permitting occasional interventions to smoothen excessive volatility of the Som exchange rate in combination with fiscal consolidation. For example, in 2017, the inflation rate in the consumer sector of the Kyrgyz Republic was only 3.7% (Statista, 2018).

The floating exchange rate system has served the country well by absorbing external shocks. The downside is a reduced trust on the national currency. The real exchange rate trend dynamics, characterized by 'chronic overvaluation', is even more important for industrial development than fluctuations in the exchange rate. As the exchange rate affects directly the competitiveness of tradable sectors, Kyrgyzstan faces a tradeoff between the goal of maintaining price stability and the objective of increasing industrial competitiveness

(UNIDO, 2018). Meeting formal inflation and fiscal targets does not suffice to achieve macroeconomic stability due to high external and internal vulnerabilities. Indeed, the real macroeconomic dynamics is largely shaped by the volatility of output of Kumtor gold production, global commodity and food price dynamics, and fluctuations in remittances. This mix of factors imposes a formidable challenge to the Government.

Kyrgyzstan's fiscal policy is shaped by considerations around public debt sustainability in line with the IMF support program and accompanying conditionality and recommendations. Since 2015, Kyrgyzstan has also had to fulfill fiscal requirements under the EAEU framework. In 2016 the country pursued a rather loose fiscal policy in line with public investment programs implemented to stimulate economic growth financed via external concessional loans. Yet, towards the end of the year the government forced adjustments of its expenditures in an attempt to meet fiscal deficit targets. Since then, Kyrgyz authorities have been on track with fiscal consolidation efforts to bring the fiscal deficit to a more sustainable level of 3% in 2017 (down from 4.5% in 2016). Achieving this target was only possible due to the involvement of extra funds to cover the deficit, which was initially 11.4% (News agency 24, 2018). Adjustment is envisioned via improvements in tax administration, reduction of economic informality, optimization of tax stimulus measures and cutting down on government expenditures (UNIDO, 2018).

Kyrgyzstan receives financial aid and loans from international donors including the World Bank, the International Monetary Fund, the Asian Development Bank, the Eurasian Development Bank, the European Bank for Reconstruction and Development (EBRD), the Islamic Development Bank, and many others (Achkar, 2016). Additional financial support stems from special funds, notably the Russian-Kyrgyz Development Fund (RKDF). In June 2018, the agreement on the establishment of the joint Kazakhstan-China Eurasian Nurly (Bright) Investment Fund was signed (Qazaq Times, 2018). Active development partners include China, the Russian Federation, Japan, Switzerland, Germany, the United States, Great Britain, Turkey, Denmark, the Netherlands and many others. In 2010-2015, Kyrgyzstan received 3.51 billion US dollars, of which 86% were loans and 14% were grants; a large portion of the foreign support goes into the social sector, to cover budget deficits and to renovate infrastructure, notably transport and energy (Achkar, 2016). Growing public debt increases the country's default risks and decreases the country's attractiveness for investors.

The manufacturing in Kyrgyzstan includes the following five major sectors:

- production of basic metals and finished metal products (except machinery and equipment);
- production of food products including beverages and tobacco products;
- production of rubber and plastic products, other non-metallic mineral products;
- production of coke and refined petroleum products;
- textile production, manufacture of clothing and footwear, leather and other leather goods, which in total make up more than 95% of manufacturing's GDP (see Figure 4).

Mining is overly dominated by the commercial exploitation of the Kumtor gold mine, operated by a Canadian mining company, as well as smelting of the gold ore as a downstream activity. Gold mining and smelting

account for approximately 7-10% of Kyrgyzstan’s GDP and about 45% of the country’s total exports of goods (UNIDO, 2018), see also Figure 5.) The growth of these activities in recent years explains most of the industrial growth of the country, while other industries continue to stagnate, with the exception of some non-metallic products, as well as food products, including beverages and tobacco products.

Kyrgyzstan’s manufacturing sector is underperforming, which can be seen by comparison of the real manufacturing value (MVA) added per capita data with other countries, notably Kazakhstan and overall lower-middle income countries. This gap can be explained by the sector’s low productivity and only to a lesser extent the specialization patterns (UNIDO, 2018). The latter is evidenced by the fact that the value-added share of manufacturing is comparable to that of comparator country groups, such as lower-middle income countries.

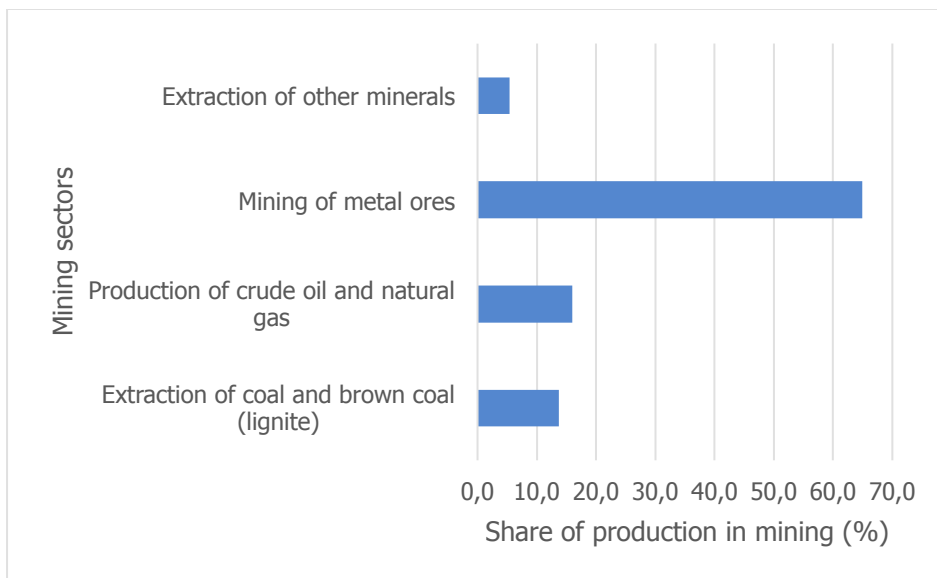


Figure 5. Contribution of each mining sector to the overall mining production (2017). Source: (National Statistical Committee of the Kyrgyz Republic, 2018).

Kyrgyzstan maintains a rather open trade and investment policy (UNIDO, 2018). It was the first of the former Soviet republics to join the WTO in 1998. Export of Kyrgyz’s goods and services constituted 35.4% of nominal GDP in 2017, while imports accounted for 66.8% (World Bank, 2018).

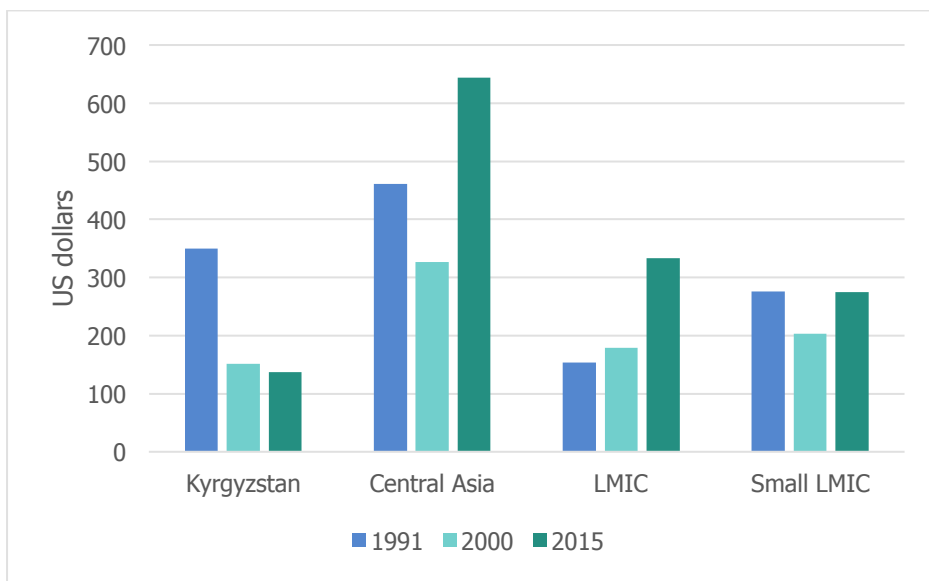


Figure 6. Manufacturing value added (MVA) per capita (in constant 2010 prices), international comparison, 1991-2015. LMIC = lower-middle-income countries. Small countries are countries with a population of less than 12.5 million in 2016. Source: (UNIDO Statistics Data Portal, 2018) and (UNIDO, 2018).

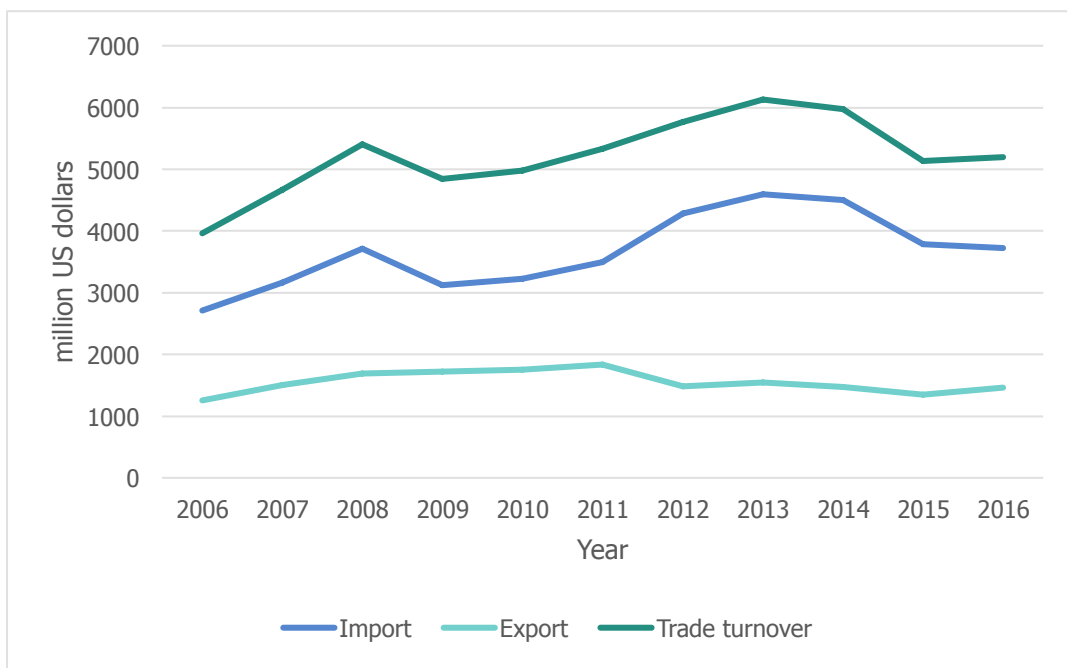


Figure 7. Kyrgyzstan's export and import (in constant 2010 prices). Source: (National Statistical Committee of the Kyrgyz Republic, 2018), own calculation.

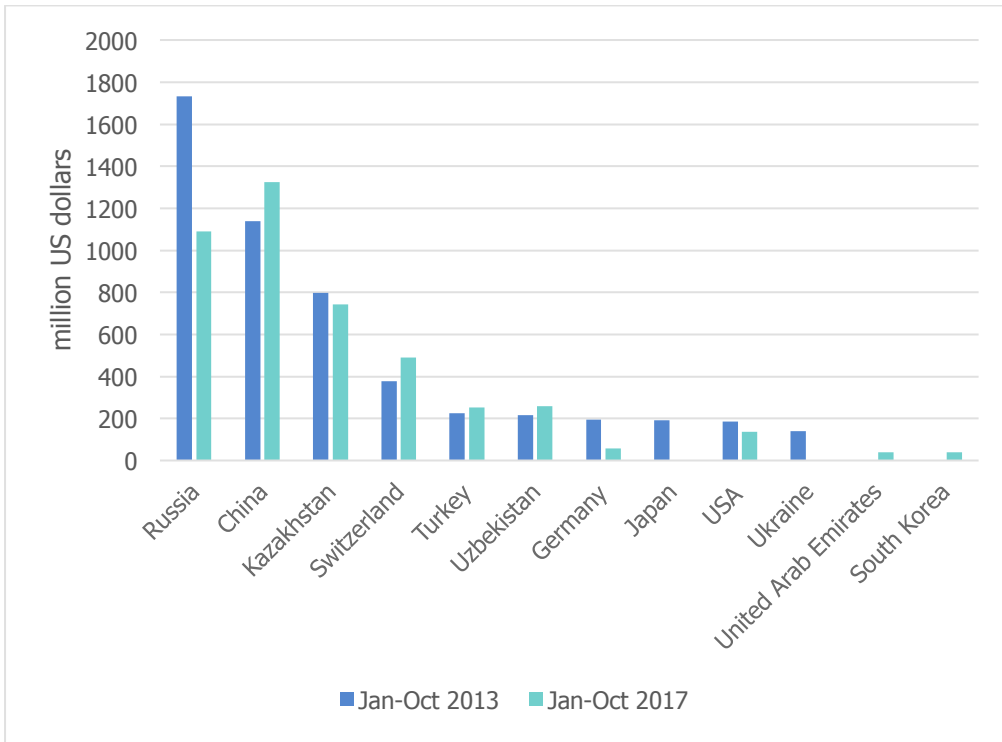


Figure 8. Commodity turnover of Kyrgyzstan with its main trade partners in January-October 2013 and January-October 2017 (in current prices). Source: (National Statistical Committee of the Kyrgyz Republic, 2018).

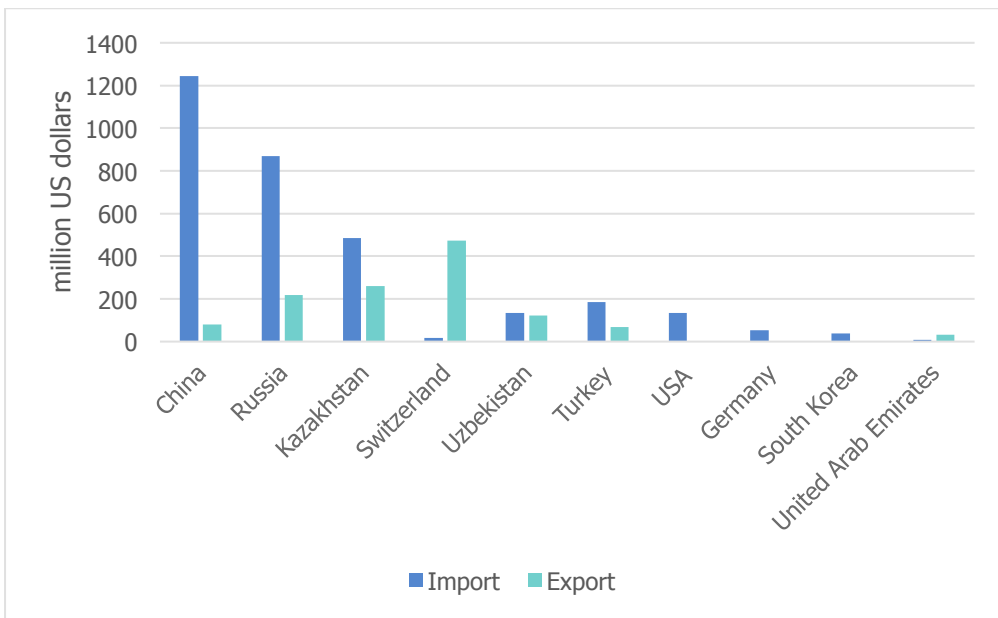


Figure 9. Import and export of Kyrgyzstan from and to its main trade partners in January-October 2017 (in current prices,). Source: (National Statistical Committee of the Kyrgyz Republic, 2018).

Drivers of growth of exports include increased exports of glass, butter, precious metals, non-monetary gold and dried fruits. The rise in imports is associated with an increase in imports of fabrics, ceramic products, vehicle tires, medicines and petroleum products (UNIDO, 2018).

Kyrgyzstan's main trading partners are neighboring countries: China, Russia, and Kazakhstan (see Figures 8 and 9). At the end of 2017, political tensions with Kazakhstan resulted in enhanced border control and restricted bilateral trade which in turn, led to significant losses by export-oriented firms, especially those exporting perishable agro food products. While subsequent negotiations have resolved the situation, the Kazakh side maintains enhanced requirements for goods to be transported across the border.

According to Ministry of Economy, FDI inflows (Foreign Direct Investments) in 2017 totaled 590.5 million US dollars, a reduction of 28% as compared to 2016. In general, the dynamics of FDI flows into the country is characterized by a very high volatility. This is because the annual flows are typically associated with a small number of relatively large investment projects. By main economic activity, FDI flows target manufacturing (47%), professional, scientific and technical activity (21%); and the financial sphere (13%) (data for 2017; Ministry of Economy of the Kyrgyz Republic 2018). Characterized by source, the structure of FDI inflows in 2017 was the following: 44% of FDI inflows was from foreign enterprise co-owners, 37% was reinvestment of profit and 19% was the investment of own capital. Public investment projects were funded mainly by international funding sources; in 2006-2012 the domestic share varied between 2.5 and 10% (OECD, 2017).

Regional instability, weaknesses in legislative frameworks and other factors, such as administrative procedures and risks for investment, decrease the attractiveness of Kyrgyzstan for potential foreign investors (Abdolvand et al., 2014).

3. Main strategic documents for Kyrgyz industrial development

During more than 25 years of Kyrgyzstan's independence, a plethora of strategic and policy documents have been adopted with multiple recommendations on different aspects of the economic development of the country. To ensure cohesion among these policies and synergistic effects in their implementation, it is pertinent to take a stock of major recommendations and come up with a priority list.

A guiding document in this regard should become the ***National Strategy for Sustainable Development of the Kyrgyz Republic for 2018-2040. "Taza Kom - Jany Door"*** (GoK, 2017a) (in what follows "Strategy for Sustainable Development"), which is currently under discussion and review by the current prime minister. It sets the overall goal to deliver decent living conditions for people based on economic growth, the creation and preservation of decent jobs, balanced development of Kyrgyz regions, strengthening of competitiveness and export potential of the country, quality improvement, innovative and production potential of the country. The National Strategy for Sustainable Development stipulates three main targets: (1) economic wellbeing of people, (2) social wellbeing, and (3) security and fair environment for living, which should be achieved through the following major mechanisms:

- Development and widespread adoption of digital technologies
- Systems approach and strategic government planning

- Further specialization of Kyrgyzstan's economy in sectors where the country possesses comparative advantages, and that can have positive effects on the livelihoods of the population.

In regard to governance, the Strategy of Sustainable Development sets the goal to guarantee the development of Kyrgyzstan as a democratic state with a stable political system, reliance on own capacities, the rule of law and the principle of unity.

However, in April 2018, Jany Doorgo Kyrk Kadam program was replaced by a new program called the ***Development Program of the Kyrgyz Republic "Unity, Trust, Creation" for the period 2018-2022*** (GoK, 2018) (in what follows "Unity, Trust, Creation" Program). The "Unity, Trust, Creation" program outlines a set of reforms concerning the public administration, the development of an economic foundation of people's welfare, ensuring a fair environment for living, the achievement of macroeconomic and financial stability, the development of small and medium-sized businesses, and the establishment of public-private partnerships. Special attention is paid to the development of strategically important economic sectors, such as the agro-industrial sector, tourism, light industry, construction, mining, energy and manufacturing as well as to the development of human potential, gender, environmental and technological problems. The "Unity, Trust, Creation" program supports national reform programs, including Taza Koom program. In regard to industrial development, it stipulates that in order to attract private capital into the economy, it is necessary to reform the markets for goods in the main economic sectors. The energy sector could benefit substantially from investment and subsequently become a driver of growth; yet it is currently stagnant as a result of the suspension of reforms. In order to stimulate the development of entrepreneurial initiatives, the Government will pursue a liberal fiscal policy in the next five years, will simplify taxation and customs regimes and will work toward a properly developed mechanism for protecting investments. An integrated approach to the development of Kyrgyz regions is needed. A new action plan specifying the development directions under the "Unity, Trust, Creation" program is being elaborated by the Government at the time of writing this report.

The issue of integrated development of Kyrgyz regions is addressed in the ***Concept of the Regional Policy of the Kyrgyz Republic for the period 2018-2022*** (GoK, 2017c) adopted in April 2017. The main goal of the regional policy of Kyrgyzstan is to ensure an accelerated socio-economic development of regions to improve the welfare and quality of citizens' life. These goals should be achieved through support of major priority regions, including development centers, relevant territories and infrastructure. The proposal is to change the development policy from a transitional approach, focused on sectorial developments, to an integrated model of regional development based on identity, specificity and regional specialization. An important step will be a transition from the dispersal of investments to their concentration via strategically selected national projects. Strategic and business planning should be used, as well as risk management to plan and implement a number of regional clusters.

Several sector-specific policies have been adopted in Kyrgyzstan recently. For example, the ***Concept of Development of Organic Agricultural Production in the Kyrgyz Republic for 2017-2022*** (GoK, 2017b) aims to create favorable conditions for the development of organic agriculture by improving regulatory legal acts and adopting other measures supporting the sustainable development of the agricultural sector and increasing the competitiveness of organic products. ***The National Energy Program for 2008-2010 and the strategy for the development of the fuel and energy complex until 2025*** (GoK, 2008) aims to underpin the social and economic development of the country and its regions through a reliable energy supply to consumers with a minimal resource consumption and environmental impacts, considering natural and climatic, economic, social, technical and environmental external factors. The concept pays attention to

improving energy efficiency, reducing the technogenic impact on the environment, solving social issues and strengthening international cooperation and financial recovery of the industry.

4. Competitive advantages, challenges and opportunities for industrial development

Opportunities for the industrial development of Kyrgyzstan stem from its natural resource base and its strategic location in the proximity of the large and growing markets of the Russian Federation, China, Kazakhstan and Uzbekistan. The latter is an opportunity to tap into the current geopolitical and economic trends and integration processes. Kyrgyzstan features modest competitive advantages coming mainly from a quality education base, low labor and other input costs, moderate inflation rate and positive aspects of business climate. The overall position of Kyrgyzstan in the global rating in the Global Competitiveness Report 2017-2018 (WEF, 2017a) remains low - it ranks 102 of 137 countries considered. This is a significant improvement compared to rank 127 in the 2012-2013 report. Challenges and problems of the country are multiple and severe (the discussion below).

Factors of strategic importance for the planning of industrial development can be broadly categorized into the following categories:

- Governance, institutions, legal base, government regulation & market mechanisms
- Production base, technology & infrastructure
- Human capital & labor market
- Finances, banking sector & financial market
- Domestic demand, global and regional competition & access to markets

4.1. Governance, institutions, legal base, government regulation and market mechanisms

Strengths: Some of the business environment parameters in Kyrgyzstan are supportive of producers. For example, the Global Competitiveness Report 2017-2018 (WEF, 2017a) asserts that the corporate tax rate is only 29% of profits; starting a business is relatively easy – it takes only four procedures 10 days; the index describing the strength of investor protection is 6.3 of 10 (see Table 2).

Weaknesses: First and foremost, corruption, followed by policy and government instability (WEF, 2017b). Problems of the institutional system include low observance and enforcement of property rights, lack of judicial independence, too high burden of governmental regulations, e.g. in tax administration, labor and social security (social fund) and sanitation as well as in the process of issuance of licenses and permits (UNCTAD, 2013); to name a few most severe ones (see Table 1). There are problems with the market

economy due to the lack of local competition and ineffectiveness of the anti-monopoly policy. Non-tariff barriers, including the burden of customs procedures restrict trade stronger than tariff policies (see Table 2).

Since the regulatory environment and the cost and administrative burden associated with meeting all necessary requirements increase with firm size (ADB, 2013), firms have a strong incentive to stay small and forego any opportunity for growth (UNIDO, 2018) by staying below a minimum efficient scale of production.

Table 1. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Institutions pillar in Kyrgyzstan in comparison with several selected countries.

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
Irregular payments and bribes	122	76	73	81	49
Property rights	119	116	81	112	53
Judicial independence	102	90	79	110	46
Favoritism in decisions of governmental officials	86	66	70	132	20
Public trust in politicians	78	51	39	125	27
Burden of governmental regulation	77	79	54	88	18
Strength of investor protection	41	51	3	25	102
Institutions – overall	103	83	60	108	41

Table 2. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Goods market efficiency pillar in Kyrgyzstan in comparison with several selected countries.

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
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Intensity of local competition	124	72	114	116	33
Effectiveness of anti-monopoly policy	109	83	84	130	30
Prevalence of non-tariff barriers	104	112	65	100	58
Burden of customs procedures	96	76	79	108	44
Trade tariffs	68	72	66	62	118
Time to start a business	60	59	53	29	116
Total tax rate	33	101	34	22	132
No. of procedures to start a business	18	18	36	36	104
Goods market efficiency - overall	81	80	72	111	46

These results are also confirmed by a UNDP analysis, which revealed a number of barriers hindering investment in the hydropower sector (UNDP, 2016), including the lack of government guarantees for returns on investment (both local and foreign), constantly "jumping" exchange rates, the lack of strict rules in the Kyrgyz legislation on land allocation and reliability of water use, excessive bureaucracy in land acquisition, etc. Historical legacies shape water institutions in the region. The water administration remains characterized by a predominantly hierarchical culture, strong fragmentation, and a lack of horizontal coordination (Abdolvand et al., 2014). These challenges are not exclusive of the hydropower sector, but of a structural nature for the entire Kyrgyz economy.

The Government of Kyrgyzstan has identified the lack of transparency and accountability as one of the key problems hindering a faster economic development in the country. Exercised reforms to improve the situation have delivered only limited results. Hence, the industrial development strategy should take the existent institutional framework into account as a starting point. Since institutions are slow to change and often the most pressing problems are left untouched until a massive crisis occurs, chances are high that the current governance problems will prevail in the short- and medium-term. A prudent and realistic assumption is that the industrial development strategy has to be designed for and implemented within the current institutional confinements (UNIDO, 2018).

4.2. Environmental services, production base, technology and infrastructure

Strengths. Kyrgyzstan is relatively poor in terms of mineral resources except for gold, coal and rare earth metals, whose extraction plays an important role in the national economy. Generally, Kyrgyzstan enjoys low prices of inputs (UNIDO, 2018). For example, abundant water resources contribute to low irrigation costs in agriculture, which generates about 15% of the GDP and offers about 30% of jobs in the country (FAO, 2015). Rivers can be used in hydropower generation. Hydropower resources amount to 245.2 billion kWh, with a technically feasible potential of 142.5 billion kWh, and economic (production) potential of 60 billion kWh (GoK, 2008). Hydroelectric power plants are already of vital importance for ensuring national energy security with virtually no oil and gas available in the country; they also offer high potential for exporting electricity (ADB, 2013).

Weaknesses. Kyrgyzstan suffers from extremely low input productivity because of insufficient managerial and technological practices and skills (UNIDO, 2018). This situation, in which productivity-related elements are the main bottlenecks for international cost competitiveness, is a common phenomenon in developing countries (Khan, 2014).

The price of capital is high, varying across industries and firm size; general interest rate is high ($\approx 20\text{-}30\%$, annually), but subsidized loans are available for special industries (e.g. textiles) at 5% annually (UNIDO, 2018).

Water resources (including rivers and lakes) have been threatened by international and national problems. Poor water management, especially in agriculture, water pollution from manufacturing and mining along with inadequate water sewage system in the urban area negatively impact both the quality and quantity of water resources. Water quality is deteriorated by chemical and organic pollution that stem mainly from numerous (untreated) dumps and waste tailings from mining enterprises. Additional pollution reaches the water systems through sewages as only 56% of cities and urban settlements dispose of centralized sewage systems with adequate facilities. And even where treatment facilities exist, these often do not meet basic sanitary standards. Therefore, concerns about drinking water are well justified and are further aggravated by the fact that more than 90% of drinking water is used in agriculture – mainly for irrigation. This high share of water up-take on the account of the agricultural sector is due to inefficient use of water resources resulting from outdated irrigation technologies and a lack of water saving technologies (UNIDO, 2018).

Climate change is predicted to seriously impact on semi-arid countries like Kyrgyzstan via decreased water levels. The observed temperature has risen twice as fast in Central Asia as compared to global levels since the 1970s (Schubert et al., 2007). Climate change is very evident in Central Asia through the melting of glaciers, which negatively affects the hydropower potential. Even in the most glacier-friendly scenario, glaciers will lose up to two thirds of their 1955 mass by the end of the 21st century, while in 2012 already 27% was lost (Sorg, Huss, Rohrer, & Stoffel, 2014; Zhupankhan, Tussupova, & Berndtsson, 2017). The Government has already identified the negative impacts on water resources as one of the most severe climate change risks for

Kyrgyzstan, and adaptation measures are important to secure safe and sufficient water resources for their consumers within the country and its neighboring states (GoK, 2009b, 2009a, 2009c). This not only poses a challenge for sustainability but threatens the country's industrial potential whose energy generation is largely dependent on hydropower.

Another major environmental challenge that directly affects agro-processing industry is the degradation of agricultural land, including the erosion of soil, salinization, loss of humus and contamination due to the extensive use of fertilizers and suboptimal cropping patterns, which is not recoverable for decades. In 2011, more than half of the agricultural land, including arable land and pastures, was subject to degradation (Ubaidullaev, 2015).

An inadequate supply of infrastructure is among the ten most problematic factors for doing business in Kyrgyzstan according to an Opinion Survey by the World Economic Forum (WEF, 2017b), see also Table 3. The transport infrastructure in Kyrgyzstan is largely inherited from the times of the Soviet Union and hence is old and obsolete. Roads are used extensively for transportation, but at least a 13% of the roads are in a very poor condition and need the rehabilitation or reconstruction (Autogid, n.d.). The railway network is small, only 467 kilometers in total length, with a broad track gauge (1520 millimeters). It is divided between the Southern and the Northern regions and features a number of dead-end branch lines. Separate railway lines connect Kyrgyzstan with Kazakhstan in the North and Uzbekistan in the South, and the two regions are not connected by rail (UNECE, 2015). However, the existing capacity is in a reasonably good condition although expensive (UNIDO, 2018). Transport and logistics infrastructure, both in terms of overall capacity and adherence to international standards impede trade development in Kyrgyzstan (UNECE, 2015).

Additionally, there are perceived problems related to the organization of road transportation. These transport services are mainly provided by privately-owned mini-buses or road carriers, which are predominantly private entrepreneurs using old trucks. This way of organizing commercial transportation tends to be inefficient resulting in relatively high transport rates (ADB, 2013; UNIDO, 2018). The outdated transport vehicles are emission-intensive and therefore problematic from an environmental perspective.

Energy infrastructure, notably, access to electricity, is another bottleneck for businesses. The electricity infrastructure in Kyrgyzstan was built during the Soviet time, when Central Asia was treated as one region. Current infrastructure is old and inefficient; it needs modernization (see also Table 3). The energy sector in 2013 had a deficit of 4.6 billion USD, covered through loans -in 2014 it was already 6.3 billion dollars. In these conditions, the investment attractiveness of the industry is predictably low. The sector faces frequent outages during the winter months (due to low water flows) and a high level of loss in electricity transmission (UNECE, 2017; UNIDO, 2018).

The seasonal variation of the electricity load has a ratio of 3:1 between the month of the highest demand (January) and the month of the lowest demand (May). Overloading the systems to meet high winter demand

has accelerated the deterioration process and increased the number of service interruptions (Jorde & Terenteva, 2009).

An important barrier for development is an unsustainable electricity tariff subsidy regime introduced in 2009 and that has been maintained by the Government as a social security measure. This and other institutional barriers result in a significant financial burden on public budgets; moreover, they seriously hold-up modernization and expansion of the electricity, heat and gas systems (IEA, 2015). Kyrgyzstan has one of the lowest electricity tariffs in the world, low tariffs motivate higher demand, given weak incentives to save energy. Residential demand increased by almost 58% during the period 2007-2016, while the number of customers only increased by 12% in this same period. Growing domestic demand means less surplus power to export and in fact often resorts to costly imports (World Bank, 2017). According to UNECE, tariff reforms are considered the single most important policy action needed to improve the financial viability of the heating sector and to incentivize end-user energy efficiency (UNECE, 2017). The World Bank points out that the tariff structure is believed to incentivize fraud with small commercial users reportedly registering themselves as residential consumers to bypass the higher tariff category. At present, the technology level and the level of innovation are both extremely low in Kyrgyzstan.

Table 3. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Infrastructure pillar in Kyrgyzstan in comparison with several selected countries.

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
Quality of overall infrastructure	112	74	77	105	47
Quality of roads	122	114	115	102	42
Quality of railroad infrastructure	76	23	32	69	17
Quality of electrical supply	102	59	82	95	65
Infrastructure - overall	109	35	68	108	46

Table 4. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Technological readiness pillar in Kyrgyzstan in comparison with several selected countries

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
Availability of latest technologies	126	84	104	96	81
Firm-level technology absorption	128	72	81	85	58
FDI and technology transfer	130	109	93	104	49
Technological readiness - overall	126	57	52	74	73

Table 5. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Innovation pillar in Kyrgyzstan in comparison with several selected countries

	Kyrgyzstan	Russia	Kazakhstan	Mongolia	China
	Rank/137	Rank/137	Rank/137	Rank/137	Rank/137
Capacity for innovation	122	65	84	62	44
Quality of scientific research institutions	116	41	78	107	36
Company spending on R&D	134	54	95	94	21
Innovation – overall	126	49	84	101	28

4.3. Human capital and labor market

Strengths. Kyrgyzstan is relatively strong in its human capital. Notably, the primary, secondary and tertiary education enrollment rates are very high – 98%, 92% and 47% correspondingly (see Tables 6 and 7).

The development phase, at which Kyrgyzstan is at the moment, enables relatively low wages, which can be an advantage for the economy. According to (UNIDO, 2018), the labor costs in Kyrgyzstan is about 1.4 USD per hour, which is lower than in other lower-middle-income countries, for example, Moldova (1.9 USD per hour) and Ukraine (3.1 USD per hour). It is much lower than in upper-middle-income countries, for example, Turkey with 8.1 USD per hour labor cost. In principle, this puts the country in a favorable position since at its current income level it is supposed to hold (at least latent) comparative advantages in labor-intensive industries such as food-processing and beverages, textiles and wearing apparel.

Weaknesses. The advantage of low labor costs is eroded by very low labor productivity. Real labor productivity is particularly low in the manufacturing sector, which is where it matters most because it should be the country's main tradable goods-producing sector. However, in Kyrgyzstan real labor productivity in manufacturing is lower than in the services sector on average, which is in stark contrast with the situation in other low-middle income countries (LMICs). Moreover, labor productivity in manufacturing has deteriorated markedly over time. In 2012, the real labor productivity was only a fraction of that in small LMIC and only half of that in Moldova and four times lower than that in poorer Tajikistan (UNIDO, 2018).

Despite the high enrollment rates at all stages of education, the quality of education at all levels is low. Also, in terms of health, the situation in Kyrgyzstan is negative, as illustrated by, for example, the life expectancy that is just 70.7 years (see Table 6).

The overall rank of the labor market efficiency of Kyrgyzstan in the Global Competitive Index is very low (see Table 8); due to the poor economic and social situation, the country cannot attract and retain talent. Female participation in the labor force is also low. On the other hand, despite the existing tax privileges, businessmen complain on high social security payment rates, which prevent from development labor-intense sectors.

Consequently, a significant fraction of the national economy is grey/informal, which is especially prevalent in agriculture and trade. Grey business not only evades taxes, decreasing the state budget revenues, they also hinder prospect of more dynamic productivity development.

Table 6. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Health and primary education pillar in Kyrgyzstan in comparison with several selected countries.

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
Business impact of tuberculosis	104	79	107	96	102
Life expectancy	95	93	88	99	53
Quality of primary education	98	50	68	81	38
Primary education enrollment rate	37	55	4	56	1
Health and primary education - overall	75	54	59	85	40

Table 7. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Higher education and training pillar in Kyrgyzstan in comparison with several selected countries.

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
Secondary education enrollment rate	71	31	18	72	66
Tertiary education enrollment rate	62	19	63	29	67
Quality of the educational system	104	64	77	116	29
Higher education and training - overall	89	32	56	65	47

Table 8. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Labor market efficiency pillar in Kyrgyzstan in comparison with several selected countries.

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
Pay and productivity	54	57	50	102	26
County capacity to retain talent	122	59	80	127	34
Female participation in the labor force	98	51	28	57	59
Labor market efficiency - overall	113	60	35	68	38

4.4. Finances, banking sector, and financial market

Strengths. A very important source of finance in the country is foreign aid and loans from a number of international donors including the World Bank, the IMF, the ADB, the EDB, as well as bilateral sources, namely China, the Russian Federation and other development partners (see more detailed discussion and data in section 1.2). These funds have enabled the modernization of aged infrastructure and the development of new projects, as well as the transfer of technologies and modern practices. The monetary policy has been reasonably successful in Kyrgyzstan over last years, which has achieved a relatively stable and low inflation rate (see Table 10), which contributes to a more stable and predictable business environment.

Weaknesses. Other parameters affecting finances are lagging behind (see Table 10). For example, the governmental debt reached as high as 54% of the GDP in 2017 (Trading Economics, 2018). According to Enterprise Surveys by the World Bank (WEF, 2017b); data from 2011), unfavorable interest rates are the prevailing reasons for firms not to apply for a credit or loan. Complex procedures are the second reason, but it appears only in textile sector. These parameters, among others, are reflected in low national credit rankings (see Table 9).

Table 9. Kyrgyzstan's credit ranking according to Moody's (Moody's, 2015): Moody's Long-term Corporate Obligation Rating; Obligations rated Caa3 are judged to be of poor standing and are subject to very high credit risk. Obligations rated B2 are considered speculative and are subject to high credit risk. Obligations rated Ba1 are judged to have speculative elements and are subject to substantial credit risk. Obligations rated Baa3 are subject to moderate credit risk; they are considered medium grade and as such may possess certain speculative characteristics. Obligations rated A1 are considered upper-medium grade and are subject to low credit risk. Source: (NASDAQ, n.d.)

	Kyrgyzstan	Russia	Kazakhstan	Mongolia	China
Country's credit ranking	B2 (stable)	Ba1 (stable)	Baa3 (stable)	Caa1 (stable)	A1 (stable)

Interviews with stakeholders in three strategic industries showed that access to finance was a more acute obstacle for smaller firms, which have fewer fixed assets that could act as collateral, generally have a considerably harder time repaying expensive loans due to lower profit margins, and hardly have the necessary time and resources to handle the complex application procedures. Limited access to finance is problematic as it undermines firms' investment potential and forces financially weak firms to either scale down or totally abandon planned investment projects. In the Kyrgyz case, where many firms still operate outdated and inefficient production technologies, limited access to external funds strongly decelerates the shift to more efficient and productive leading-edge production technologies and inhibits the expansion of existing production processes and lines. Consequently, financially constrained Kyrgyz firms are unable to exploit existing growth potentials. In light of generally stronger financing obstacles among smaller firms and

the predominance of small firms in the three strategic industries, the size of unexploited growth potential is substantial (UNIDO, 2018).

Table 10. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Macroeconomic environment pillar in Kyrgyzstan in comparison with several selected countries.

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
Government budget balance	99	84	96	134	85
Government debt	84	6	11	62	63
Country credit rating	97	61	62	94	26
Inflation	45	112	130	1	1
Macroeconomic environment - overall	88	53	98	89	17

Table 11. Selected components of the Global Competitiveness Index (WEF, 2017a) illustrating the state of the Financial market development pillar in Kyrgyzstan in comparison with several selected countries

	Kyrgyzstan Rank/137	Russia Rank/137	Kazakhstan Rank/137	Mongolia Rank/137	China Rank/137
Availability of financial services	97	101	95	129	54
Easy of access to loans	80	110	98	121	34
Financial market development - overall	86	107	114	129	48

Table 12 summarizes the strengths and weaknesses, challenges and opportunities for the industrial development of Kyrgyzstan.

Table 12. Summary of major strengths and weaknesses as described in sections 4.1-4.4.

	Strengths	Weaknesses
Governance, institutions, legal base, government regulation & market mechanisms	Low corporate tax; ease of starting a new business; strength of investor protection	Corruption; policy and government instability; problems of the institutional system; obsolete governance practices Problems with the market economy; non-tariff barriers (incl. burden of the customs procedures); volatile exchange rates;
Environmental services, production base, technology &	Rich in gold, coal and rare-earth metals Low prices on inputs, notably,	Low productivity High price of capital, low tariffs for electricity

infrastructure	energy	Problems with water and water management; climate change; degradation of land; other environmental problems Poor infrastructure notably transport and energy Low level of technology and innovation
Human capital & labor market	Broad education coverage Low labor costs	Low levels of skills and low labor productivity Low labor market efficiency High level of the economy's informality
Finances, banking sector & financial market	Availability of foreign aid and loans Stable and low inflation rate	High governmental debt; highly unfavorable interest rates; limited access of small business to finances; low national credit ranking

References

- Abdolvand, B., Mez, L., Winter, K., Mirsaeedi-Gloßner, S., Schütt, B., Rost, K. T., & Bar, J. (2014). The dimension of water in Central Asia: security concerns and the long road of capacity building. *Environmental Earth Sciences*, 73(2), 897–912. <https://doi.org/10.1007/s12665-014-3579-9>
- Achkabar. (2016). Debt arithmetic: Where the Government spent 3.5 billion dollars from donors. Retrieved July 28, 2018, from <https://www.akchabar.kg/news/abd-money-transfer-2018/>
- Achkabar. (2018). The inflow of remittances into the Kyrgyz Republic will grow by 25%. Retrieved July 28, 2018, from <https://www.akchabar.kg/news/abd-money-transfer-2018/>
- ADB. (2013). *Kyrgyz Republic: Power Sector Rehabilitation Project*. Asian Development Bank.
- ADB. (2018). *Asian development outlook (ADO) 2018: How Technology Affects Jobs*. Asian Development Bank. Retrieved from <https://www.adb.org/publications/asian-development-outlook-2018-how-technology-affects-jobs>
- Ariu, A., Breinlich, H., Corcos, G., & Mion, G. (2017). *The Interconnections Between Services and Goods Trade at the Firm-Level*. CEPR Discussion Paper 12169. Retrieved from http://www.cepr.org/active/publications/discussion_papers/dp.php?dpno=12169
- Autogid. (n.d.). Roads of Kyrgyzstan. Retrieved from http://news.avtogid.kg/dorogi_kyrgyzstana/
- Choi, J., Portugal Perez, L. A., & Myburgh, A. C. (2014). Kyrgyz - The garment sector: Impact of joining the customs union and options to increase competitiveness. Retrieved from <http://documents.worldbank.org/curated/en/965851468276859239/Kyrgyz-The-garment-sector-Impact-of-joining-the-customs-union-and-options-to-increase-competitiveness>
- FAO. (2015). *FAO Country Programming Framework in Kyrgyz Republic 2015-2017*.
- GoK. (2008). *The National Energy Program for 2008-2010 and the strategy for the development of the fuel and energy complex until 2025*. Bishkek: Government of the Kyrgyz Republic.
- GoK. (2009a). *Agreement on new conditions for the Kumtor project*. Bishkek: Government of the Kyrgyz Republic.
- GoK. (2009b). *Second National Communication of the Kyrgyz Republic to the UN Framework Convention on Climate Change*. Bishkek: Government of the Kyrgyz Republic. Retrieved from www.unfccc.int/resource/docs/natc/kyrnc2e.pdf
- GoK. (2009c). *The concept of Sustainable development of the ecological and economic system "Issyk-Kul for the period until 2020"*. Bishkek: Government of the Kyrgyz Republic.
- GoK. (2017a). *National strategy for Sustainable Development of the Kyrgyz Republic for 2018-2040. "Taza Kom - Jany Door" (draft)*. Bishkek: Government of the Kyrgyz Republic.
- GoK. (2017b). *The Concept of development of organic agricultural production in the Kyrgyz Republic for 2017-2022*. Bishkek: Government of the Kyrgyz Republic.
- GoK. (2017c). *The Concept of the Regional policy of the Kyrgyz Republic for the period 2018-2022*. Bishkek: Government of the Kyrgyz Republic.
- GoK. (2018). *Development Program of the Kyrgyz Republic "Unity, Trust, Creation" for the period 2018-2022*. Bishkek: Government of the Kyrgyz Republic.
- IEA. (2015). *World Energy Outlook 2015*. International Energy Agency. Retrieved from <https://www.iea.org/publications/freepublications/publication/WEO2015.pdf>
- Jorde, K., & Terenteva, O. (2009). *Regional Reports on Renewable Energies. Country Analysis on Potentials and Markets in Central Asia*. Kyrgyzstan.
- Kabar. (2018). Prospects for the growth of remittances to Kyrgyzstan. Retrieved July 28, 2018, from <http://kabar.kg/news/iatc-kabar-perspektivy-rosta-denezhnykh-perevodov-v-kyrgyzstan/>
- Khan, A. S. (2014). *The SME Missing Middle Problem in Developing Countries and its Link to Lack of Financing: The Case of Bangladesh*. University of Ottawa. Retrieved from https://ruor.uottawa.ca/bitstream/10393/31576/1/Khan_Azfar_2014_researchpaper.pdf
- Manley, D., & Kulova, N. (2018). *Should the Government of the Kyrgyz Republic Impose a Tax on Gold Ores and Concentrates?*
- Moody's. (2015). Moody's assigns first-time B2 issuer ratings to Government of the Kyrgyz Republic; stable

- outlook. Retrieved July 29, 2018, from https://www.moodys.com/research/Moodys-assigns-first-time-B2-issuer-ratings-to-Government-of--PR_331302
- NASDAQ. (n.d.). Glossary of Stock Market Terms & Definitions. Retrieved August 10, 2018, from <https://www.nasdaq.com/investing/glossary/>
- National Statistical Committee of the Kyrgyz Republic. (2018). National Statistical Committee of the Kyrgyz Republik. Retrieved July 29, 2018, from <http://www.stat.kg/en/>
- News agency 24. (2018). Budget deficit in Kyrgyzstan in 2017 amounts to 17.4 bln soms. Retrieved July 28, 2018, from https://24.kg/english/74279_Budget_deficit_in_Kyrgyzstan_in_2017_amounts_to_174_bln_soms/
- OECD. (2017). *Meeting of the OECD Council at Ministerial Level. Updated report 2017- Inclusive growth*. Paris.
- Qazaq Times. (2018). Kazakhstan and China create a joint investment fund. Retrieved July 28, 2018, from <https://qazaqtimes.com/en/article/41745>
- Schubert, R., Schellnhuber, H. J., Buchmann, N., Epiney, A., Griebhammer, R., Kulesa, M., ... Schmid, J. (2007). *Climate Change as a Security Risk*. German Advisory Council on Global Change (WBGU). Retrieved from https://www.wbgu.de/fileadmin/user_upload/wbgu.de/templates/dateien/veroeffentlichungen/hauptgutachten/jg2007/wbgu_jg2007_engl.pdf
- Sorg, A., Huss, M., Rohrer, M., & Stoffel, M. (2014). The days of plenty might soon be over in glacierized Central Asian catchments. *Environmental Research Letters*, 9(10). <https://doi.org/10.1088/1748-9326/9/10/104018>
- Statista. (2018). Kyrgyz Republic - inflation rate 2012-2022. Retrieved July 28, 2018, from <https://www.statista.com/statistics/528575/inflation-rate-in-kyrgyz-republic/>
- Szirmai, A. (2008). *Explaining Success and Failure in Development. MERIT Working Papers*. United Nations University - Maastricht Economic and Social Research Institute on Innovation and Technology (MERIT). Retrieved from <https://ideas.repec.org/p/unm/unumer/2008013.html>
- Szirmai, A., & Verspagen, B. (2015). Manufacturing and economic growth in developing countries, 1950–2005. *Structural Change and Economic Dynamics*, 34, 46–59. <https://doi.org/10.1016/j.strueco.2015.06.002>
- Trading Economics. (2018). Kyrgyzstan Government Debt to GDP | 2000-2018. Retrieved July 29, 2018, from <https://tradingeconomics.com/kyrgyzstan/government-debt-to-gdp>
- Ubaidullaev, M. B. (2015). Problems of ground resources in Kyrgyzstan, agro-food economy. *Territoriya Nauki*, (5), 94–100.
- UNCTAD. (2013). *National Services Policy Review of Kyrgyzstan*. New York and Geneva. Retrieved from <http://unctad.org/en/Pages/DITC/TNCD/Trade-Negotiations-and-Commercial-Diplomacy-.aspx>
- UNDP. (2016). Challenges and ways of development of the small hydropower in the Kyrgyz Republic. Retrieved July 29, 2018, from <http://www.kg.undp.org/content/kyrgyzstan/en/home/presscenter/articles/2016/03/03/challenges-and-ways-of-development-of-the-small-hydropower-in-the-kyrgyz-republic.html>
- UNECE. (2015). *Regulatory and Procedural Barriers to Trade in Kyrgyzstan. Needs Assessment*. New York and Geneva. Retrieved from https://www.unece.org/fileadmin/DAM/trade/Publications/ECE_TRADE_412E-Kyrgyzstan.pdf
- UNECE. (2017). *Renewable Energy Status Report 2017*. Paris.
- UNIDO. (2018). *Diagnostic for the Programme for Country Partnership (PCP). The Kyrgyz Republic. Building a competitive manufacturing base for strong and inclusive growth*.
- UNIDO Statistics Data Portal. (2018). MVA 2018, Manufacturing. Retrieved July 30, 2018, from https://stat.unido.org/database/MVA_2018_Manufacturing
- WEF. (2017a). *The Global Competitiveness Report 2017-2018*. World Economic Forum. Retrieved from <https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018>
- WEF. (2017b). *The Global Competitiveness Report 2017–2018. Appendix 3. The Executive Opinion Survey: The Voice of the Business Community*. World Economic Forum.
- World Bank. (2017). *A resilient economy ... on a slow growth trajectory. With a special focus on: Kyrgyzstan's ailing energy sector*. Kyrgyz Republic Economic Update No. 5. Retrieved from

<http://documents.worldbank.org/curated/en/710331496766602711/pdf/115684-WP-PUBLIC-add-series-SpringKGZBEUFinal.pdf>

World Bank. (2018). World Development Indicators (WDI) | Data Catalog. Retrieved July 28, 2018, from <https://datacatalog.worldbank.org/dataset/world-development-indicators>

Zhupankhan, A., Tussupova, K., & Berndtsson, R. (2017). Could changing power relationships lead to better water sharing in Central Asia? *Water (Switzerland)*, 9(2). <https://doi.org/10.3390/w9020139>

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