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## South Caucasus and Central Asia: The Belt and Road Initiative Armenia Country Case Study

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This Country Case Study was prepared by the South Caucasus and Central Asia MTI in collaboration with the staff from other World Bank Global Practices covering the two sub-regions. The main objective of the Country Case Studies is to provide an informed view of the potential impact of the Belt and Road Initiative over the countries of Central Asia and Caucasus and policy recommendations to reap the benefits and mitigate risks. The main authors of the Country Case Study were Kazi Matin and Evgenij Najdov, with support from the Central Asia and Caucasus MTI team. The team is grateful for the guidance from Sandeep Mahajan (Practice Manager), peer reviewers Michele Ruta, Abdulaziz Faghi and Paul Valley and for useful comments from Sascha Djumena and contributions from Violane Konar-Leacy, Victor Aragones and Ian J.D. Gillson.

### Acronyms and Abbreviations

BRI	Belt and Road Initiative	MSR	Maritime Silk Road
CAC	Central Asia and Caucasus	O&M	Operations and Maintenance
EU	European Union	PIM	Public Investment Management
FDI	Foreign Direct Investment	SOE	State-Owned Enterprise
GDP	Gross Domestic Product	SREB	Silk Road Economic Belt
ICT	Information and Communication Technology	WTO	World Trade Organization

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## Executive Summary

**Though no Belt and Road Initiative (BRI) corridor passes through Armenia, the country may still benefit from the BRI and those benefits can be enhanced if the implementation of complementary policies accompanies infrastructure improvements.** The completion of BRI transport projects in the Central Asia and Caucasus (CAC) region and around the world is estimated to reduce Armenia's shipment time by a modest 2.8 percent and trade costs by a bit more than 1 percent assuming that the BRI transport infrastructure is combined with improvements in trade facilitation that halve border-crossing delays.

**The reduction in shipment time will increase exports.** Exports are projected to increase by 2.1 percent following the completion of envisaged BRI projects, with reforms that halve border-crossing delays raising it further to 10 percent. The impact is likely to be larger for more time-sensitive export items. Given Armenia's comparative advantage, external demand and conditions of domestic supply, agriculture and processed foods and metal exports have the best prospect of sustained growth arising from BRI. However, even this will depend on complementary policies to improve the investment climate and to remove sector constraints that limit investment and production in these sectors.

**Faster shipment times and the resulting increase in profitable opportunities in time-sensitive exports are likely to boost FDI and GDP.** Overall, FDI inflow to Armenia is estimated to rise by 2.3 percent because of falling shipment time and this rise could flow into agriculture and processed foods, including from China. Shorter shipment time can also result in lower cost of imported inputs and could raise productivity and GDP, too. Armenia's GDP is estimated to increase by 2 percent from transport infrastructure improvements alone, but this could increase to up to 17 percent, provided reforms that double border-crossing efficiency are introduced. Further gains are available from lowering trade policy barriers. Given the high cost of transport projects, complementary reforms that improve the integration gains and that strengthen fiscal institutions and governance become even more important to ensure that welfare gains remain substantial.

**A range of complementary policies are needed to maximize benefits from BRI.** For example, further reform of trade facilitation and logistics will be needed for the traders to benefit more fully from access to better transport infrastructure. Also, policies to remove entry barriers and promote more competition in tradable sectors are important if those sectors' exports are to respond adequately to falling shipment time. Specifically, in the agriculture and food processing sector, removing structural constraints to production and facilitating access to finance, irrigation, and extension services as well as to information on weather, soil, crop prices will be particularly important for diversification.

**Stronger regional cooperation is needed to reap the benefits of improved physical infrastructure.** There has been no lack of cooperation initiatives in South Caucasus and Central Asia, though these appear to have had only limited usefulness, including due to selective coverage of trade and transport issues, complex rules, as well as lack of functioning dispute resolution mechanisms. In the case of Armenia, closer cooperation with Georgia and Iran (data sharing, joint procedures) will be important to make the North-South corridor viable.

**Armenia's adequate fiscal policy will only allow for a moderate scale up of public investment, especially in the post-COVID-19 environment.** One alternative to address the infrastructure gap would be to strengthen the role of the private sector in infrastructure provision, though, this would require stronger capacity to analyze projects, share risks as well as disclose and manage those risks. In addition, sector policies would need to be amended to ensure efficient pricing and regulation. In terms of public investment, stronger fiscal institutions that result in a more robust medium-term macro-fiscal framework,

stronger revenue mobilization, more efficient spending and improved public investment management (PIM) will be important.

**While the COVID-19 pandemic is reshaping supply chains, the integration agenda will remain a key ingredient of development strategies for countries like Armenia.** This note presents results of modeling exercises undertaken prior to the COVID-19 pandemic and does not capture the ongoing discussions about near-shoring production and reconfiguring global value chains. In fact, the role of global value chains in global trade had stalled even prior to the pandemic and COVID-19 has strained them further (World Bank, 2020). Still, a common transport infrastructure continues to make sense as the case for international trade, through differences in comparative advantage, specialization and economies of scale, remains strong. In fact, a number of the CAC countries, including Armenia, could benefit from efforts of companies to diversify production from China. Countries like Armenia will; however, need to pay more attention to debt sustainability and put more efforts in improving trade facilitation to better manage the risks from the slowdown of the global economy and ensure transport chains remain stable.

## 1. Introduction

**1. Armenia is a small land-locked mountainous country with relatively difficult access to regional and global markets.** The borders with Azerbaijan in the east and with Turkey in the southwest and west are closed. Only the borders with Georgia in the north and Iran in the south are open for trade and transport. Roads dominate its mode of transportation because of its mostly mountainous terrain. The only cross-border rail connection is through Georgia. None of the BRI-corridors pass through the country and even the one that goes through Georgia is only accessible in the western direction.

**2. The economy has performed well since independence though growth has been volatile and productivity gains limited.** Notwithstanding progress in macroeconomic stabilization, investment in transport infrastructure is quite constrained due to fiscal pressures and weak capacity. In addition, repeated external shocks have introduced significant volatility reflecting the narrowly based economy, low level of FDI and high dependence on remittances. The export receipts from agriculture, manufactures and metals have helped but productivity growth has stagnated in recent years. The services sector accounts for 60 percent of GDP and employment, up from 37 percent in 2000.

**3. The recent country strategy seeks to make a bigger push in the tradable sector.** The focus is on processed agriculture and food products, in addition to metals and tourism. Armenia's soil and climate conditions, high altitude, and limited use of chemical fertilizers account for flavorful produce suggesting potential for expanding agriculture into high value crops.

**4. Armenia can benefit from an improved global network as a result of BRI transport projects, even though none of the BRI corridors pass through it.** The time and money cost of its cross-border shipments depend on the quality of Georgian and Iranian roads, rail and seaports. If ongoing and planned BRI transport projects enhance their infrastructure, as well as those of the global transport network, Armenia benefits. The full benefit of lower international shipment time will also depend on the quality of Armenia's own transport network.

**5. This note assesses the potential impact of BRI over connectivity and the Armenian economy.** It looks at how, if fully implemented globally, the BRI is expected to achieve better transport connections and greater economic integration, discusses improvements in Armenia's cross-border transport, electricity and ICT infrastructure to-date, and the potential impact of the completion of BRI transport projects on lowering Armenian shipment time. It further looks at the likely economic impact of BRI-related reductions in shipment time on exports, FDI and GDP, the within-country regional distribution of that impact and how complementary policies can enhance the positive impact, mitigate risks and reduce regional inequity. Finally, it also examines the fiscal risk of scaling-up investment in BRI projects in the coming years without undermining medium-term debt sustainability.

### Box 1: Quantifying the impact of BRI

The results presented in this Country Case study envisage the implementation of all BRI transport infrastructure projects and as such are not an assessment of the impact or the cost and benefit of individual corridors or projects. The estimates were derived as part of the preparation of the World Bank's "Belt and Road Economics: Opportunities and Risks of Transport Corridors" report which uses empirical research and economic modeling to provide an objective analysis of opportunities and risks of BRI transports corridors. Estimates of the gains in shipment time were calculated by a combination of geographical data and network algorithms between 1,000 cities in 191 countries. The global network of railways and ports in 2013 is used to estimate the pre-BRI shipment times. The network is subsequently upgraded with planned infrastructure projects as part of the BRI to derive post-BRI shipment times. The projects were selected based on the criteria that the transport project is located on the corridor and that the project has been explicitly mentioned as part of BRI in an official document. This is

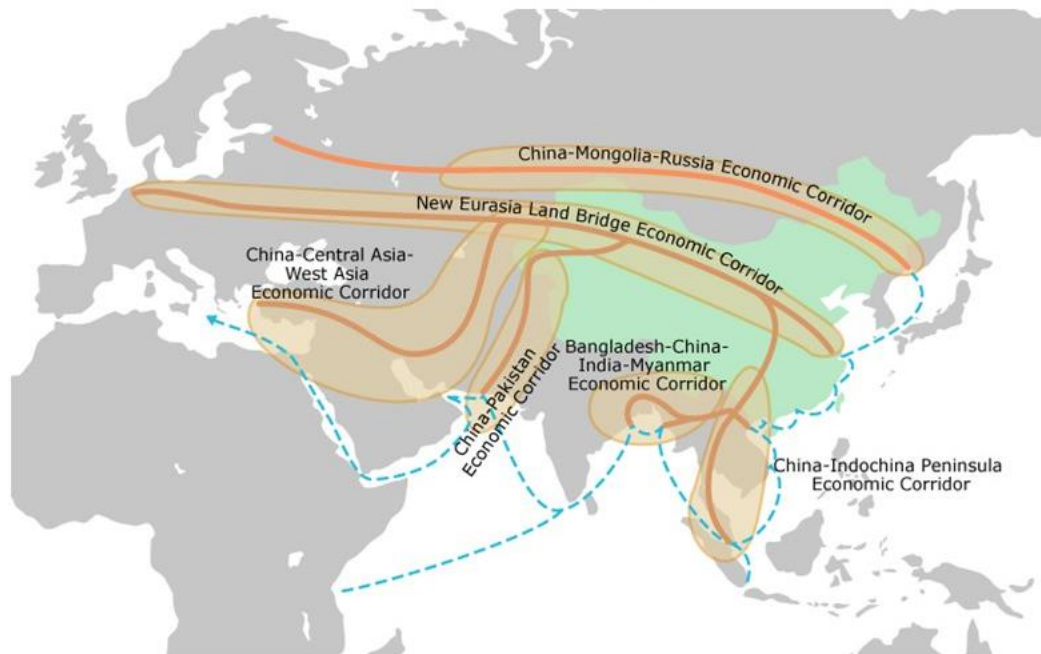
neither exhaustive nor an official list of BRI transport projects. On the two corridors that go through CAC, the report identifies around two dozen of transport connectivity projects. Out of these, around half were operational in 2019, six were under construction and the remaining were proposed.

Next, sectoral estimates of “value of time”, considering each pair of countries and each sector, transform the reduction in shipment time into reductions of trade costs. Importantly, the analysis does not assume that all infrastructure projects are good. In fact, in a separate analysis of 68 BRI projects globally, Reed and Trubetsky (2019) show that half of them generate little value when built in isolation; however, when the entire network of projects is built, this share falls to around one-third. This confirms the inter-dependence of projects as well as the importance of proper project selection and appraisal. Finally, a range of models (computable general equilibrium, structural general equilibrium and gravity models) are used to estimate the impact of the reduced trade costs on trade, FDI and GDP.

## 2. The Belt and Road Initiative

**6. The Belt and Road Initiative (BRI), announced in 2013, is an ambitious multi-year Chinese effort to improve international transport infrastructure and increase economic integration.** Its goal of better transport connections and greater economic integration is to be achieved through substantial Chinese financing of transport and complementary infrastructure<sup>1</sup> in the BRI countries, better policy coordination<sup>2</sup> among those countries, and larger flows of outward foreign direct investment (FDI) from Chinese private firms and state-enterprises, all aimed at promoting “orderly and free flow of economic factors, highly efficient allocation of resources and deep integration of markets” (NDRC et al, 2015).

Figure 1: BRI corridors



Source: Xinhua News Agency; Hong Kong Trade Development Council

<sup>1</sup> The total cost of BRI infrastructure program has been variously estimated at US\$1-4 trillion, with Chinese infrastructure commitment to date at US\$300-500 billion.

<sup>2</sup> “Countries along the Belt & Road may fully coordinate their economic development strategies and policies, work out plans and measures for regional cooperation, negotiate to solve cooperation-related issues and jointly provide policy support for practical cooperation and for large scale projects.” (see pg 3 op. cit)

**7. The initiative envisages implementation of a series of transport infrastructure projects along the Silk Road Economic Belt (SREB) land corridors and along the 21st Century Maritime Silk Road (MSR) sea-routes.** The SREB seeks to improve China's transport overland to Europe and Asia through six BRI corridors: i) the New Eurasian Land Bridge Corridor; ii) the China – Central Asia – West Asia Corridor; iii) the China – Mongolia – Russia Corridor; iv) the China – Pakistan Economic Corridor (CPEC); v) the China – Myanmar – Bangladesh – India (BCIM) Corridor and vi) the China – Indochina Peninsula Corridor. The MSR seeks to build or improve ports along the sea routes linking China's coast, one crossing the South China sea through the Malacca strait to the Indian Ocean and extending to Europe, and another crossing the South China sea and extending to the South Pacific. The BRI envisages investments not only in the corridor infrastructure (rail, road and port projects to improve cross-border transport), but also in complementary infrastructure like power and ICT. The BRI builds on the number of other initiatives aimed at improving connectivity and lower trade time and costs.<sup>3</sup> These initiatives have helped to bring down time and money cost of transport, but these remain significant.

**8. Two BRI corridors pass through CAC and connect China to Europe and China to Iran and West Asia, respectively, through five routes; none of these passes through Armenia.** The first uses two rail routes, one through Kazakhstan and Russia and the other through Kazakhstan, the Caucasus and Turkey. The second uses three routes, one through Kazakhstan, Uzbekistan and Turkmenistan, another one through Kyrgyz Republic, Uzbekistan and Turkmenistan and the third through Kyrgyz Republic, Tajikistan and Afghanistan.

Box 2: BRI Corridors and routes passing through CAC

The **New Eurasian Land-bridge BRI Corridor** connects **China to Europe** using two routes:

- **Route 1: China** (various cities, Urumqi, Alashankou) – **Kazakhstan** (Dostyk, Mointy, Nur-Sultan, Petropavl) – **Russia** (Yekaterinburg, Moscow) – **Belarus** (Brest) – **Poland** (Mafaszewicze) – **Germany** (Duisburg) and onwards to various European cities. (Note: all are operational rail connections).
- **Route 2: China** (various cities, Urumqi, Khorgas) – **Kazakhstan** (Altynkol, Almaty, Shu, Zharyk, Zhezqazghan, Saksaulskaya, Shalkar, Beyneu, Aktau) – **Azerbaijan** (Baku/Alyat, Ganja, Beyuk Kesik) – **Georgia** (Gardabani, Tbilisi, Akhalkalaki) – **Turkey** (Kars, Istanbul) and onwards by rail/road to various European cities. (Note: all are operational rail connections except Aktau to Baku, which is the Caspian Sea ferry segment).

**China-Central Asia-West Asia BRI Corridor** connects **China to Iran/West Asia** using three routes:

- **Route 3: China** (various cities, Urumqi, Khorgas) - **Kazakhstan** (Altynkol, Almaty) - **Uzbekistan** (Tashkent, Samarkand, Navoi) – **Turkmenistan** (Farab, Mary, Serakhs) – **Iran** (Sarakhs, Mashad) and onwards to West Asian cities (also India through Bandar Abbas) (Note: all are operational rail connections).
- **Route 4: China** (various cities, Kashgar) – **Kyrgyz Republic** (Irkeshtam, Osh) – **Uzbekistan** (Andijan, Pap, Tashkent, Samarkand, Navoi) – **Turkmenistan** (Mary, Serakhs) – **Iran** (Sarakhs, Mashad) and to West Asia (also India through Bandar Abbas). (Note: the route is mainly rail, except Kashgar –Irkeshtam – Osh segment by road)
- **Route 5: China** (various cities, Kashgar) – **Kyrgyz Republic** (Irkeshtam, Sary Tash) – **Tajikistan** (Karamyk, Dushanbe, Vahdat, Yavan, Nizhny Panj) – **Afghanistan** (Shir Khan Bandar, Kunduz, Mazar-e-sharif, Herat, Ghurian) – **Iran** (Torbat-e Heydarieh, Tehran) to West Asia (also, India thru Bandar Abbas). (Note: route connected partly by rail with two large segments, Kashgar – Irkeshtam – Sary Tash – Karamyk – Dushanbe and Nizhny Panj - Shir Khan Bandar – Kunduz – Herat – that are connected only by road today).

**9. The five routes are potentially viable corridors through the CAC region.** First, most of the completed, ongoing and planned BRI transport projects in the region are along these routes and thus

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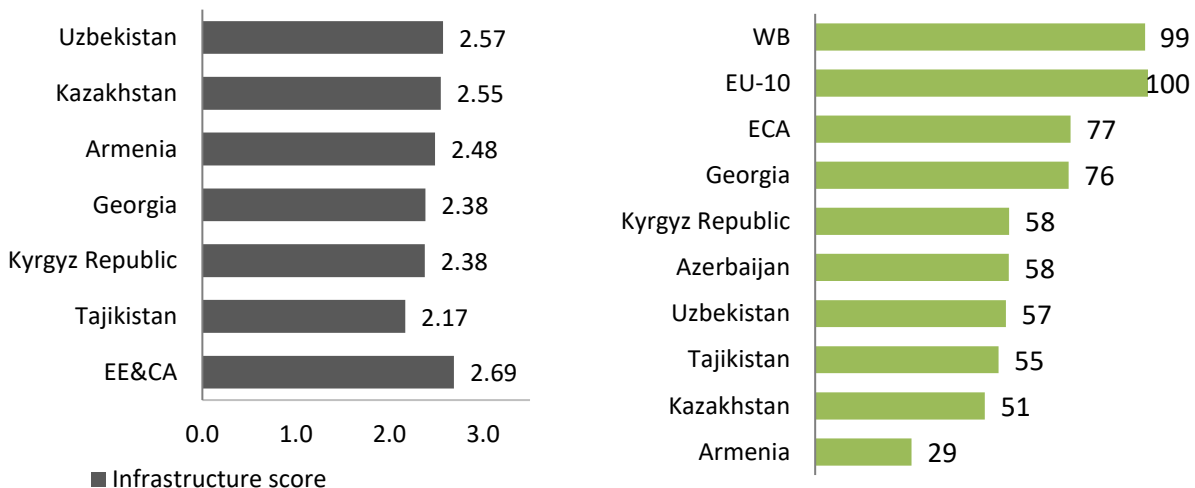
<sup>3</sup> These include the Transport Corridor Europe Caucasus Asia (TRACECA) initiative, the Central Asia Regional Economic Cooperation (CAREC) program and the Special Program for the Economies of Central Asia (SPECA) program.

provide CAC countries with their most direct exposure to BRI. Second, at least one major city of each country<sup>4</sup> is on one or more of these routes and each country can thus connect faster to the large economies of China, Korea, Europe, Russia, Turkey, Iran, and West Asia, as well as to each other. Third, China’s dependence on these routes for faster transport to the European cities and to cities in Iran and West Asia, means that both China and the CAC countries will have an interest to continually improve the operation of these corridors. Importantly, while the BRI focuses largely on the main transport corridors, improvements to the transport network at the lower levels (for example, secondary and feeder roads) are needed to ensure that the countries and populations benefit fully from the main corridors.

### 3. Improvements in Transport Infrastructure and Gaps

**10. Armenia is not on the BRI corridors and as a result there are no BRI transport projects in the country.** However, the note assesses the ability of the domestic infrastructure network and the required investments to provide an efficient link to the identified corridors through its two open borders with Georgia and Iran. It also provides estimates for the improvement in shipment time resulting from improvements in its border-crossing efficiency.

Table 1: Infrastructure quality needs to improve ...  
 Transport infrastructure quality (1=low to 5=high) Rural Access Index (in %)



Source: World Bank 2018 Logistics Performance Index

Note: rural people who live within 2 kms of an all-season road as a proportion of the total rural population.  
 Source: Mikou et al (2019)

**11. Armenia’s international transport connection is based on its access to the seaports in Georgia and in Iran using its north-south road corridor.** Notwithstanding recent investments in this road link, further upgrade and expansion is needed if it is to meet potential rising domestic and cross-border traffic. The quality of the infrastructure is perceived to be on par with peers in the CAC region, but weaker than the average for the countries in the Europe and Central Asia (ECA) region. A closer look suggests that the country has a relatively dense rail infrastructure with some room to improve efficiency, but weak road

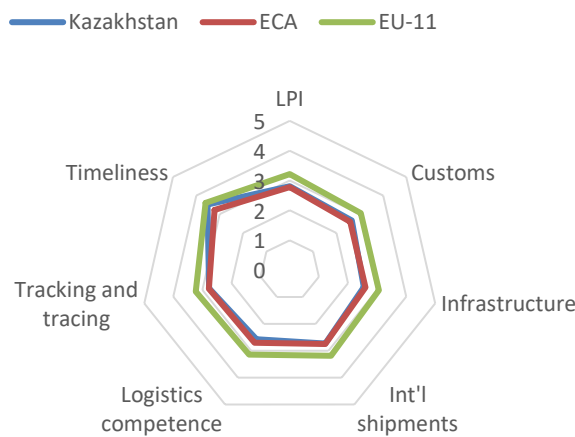
<sup>4</sup> Armenia is the only exception because of the closed Armenia-Azerbaijan border and so Armenian cities could connect to China overland by rail through Russia, which is probably not competitive and to Europe through Armenia-Georgia border.



infrastructure.<sup>5</sup> Out of urban areas, road access is poor, thus inhibiting the ability of the hinterlands to connect to markets.

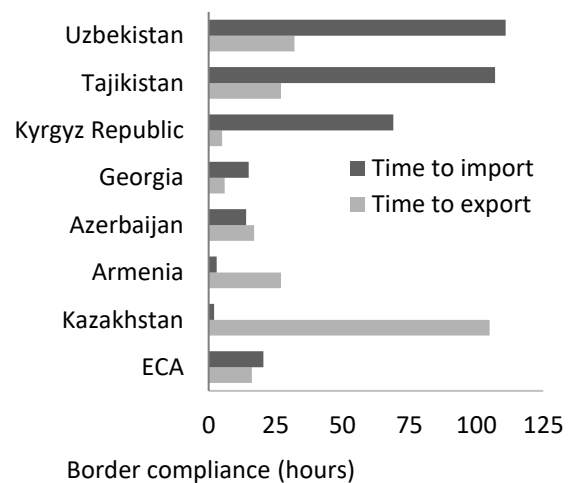
**12. The impact of poor infrastructure is compounded by inefficiencies and delays at its border crossings to Georgia and Iran which remain significant.** In 2019, Armenia is ranked 43 in the world in ‘Trading across Borders’ by Doing Business 2020 reflecting relatively long time for border compliance and high cost for documentary compliance for exports. On the imports side, absence of risk-management at border crossing means that all cargo is scanned resulting in unnecessary delays in border-crossing while costs for documentary compliance is also high. The country was ranked 92 at the 2018 Logistics Performance Index (LPI), with a rank of 81 in the customs sub-component index of LPI, and 111 on timeliness. This suggests that there is significant potential to improve border-crossing.

Table 2: ... as should trade facilitation  
 Logistics Performance Index



Source: Logistics Performance Index

Time to import and export



Source: Doing Business 2020

**13. Trade policy has become more restrictive in recent years and added to costs of trading.** With a simple average MFN tariff rate of 3.5 percent and almost two thirds of all tariff lines being duty free earlier this decade, Armenia, a WTO member since 2003, had one of the most liberal trade regimes in the region. As part of its accession to the Eurasian Economic Union (EEU), Armenia has been aligning its rates with those in the EEU resulting in the average tariff in 2018 increasing to 6.5 percent. It is on par with other EEU members from the sub-region (Kazakhstan and the Kyrgyz Republic), below Azerbaijan (9 percent – 2015 data), Uzbekistan (14.9 percent – 2015 data) and Tajikistan (7.7 percent), but well above Georgia.

**14. Though Armenia is not on any of the BRI routes, it can still benefit indirectly from neighboring Iran and Georgia because they are on the routes.** Armenian cities can use BRI corridor routes 3, 4 and 5 (Box 1) from Iran<sup>6</sup> to reach cities in Central Asia and China. This provides an additional option to Armenian shippers in addition to the seaports above to do so. Yerevan and Gyumri are currently connected by road to Tehran and Bandar Abbas in Iran and by both road (along the north-south corridor) and rail to Tbilisi, Poti and Batumi in Georgia. Their connection with hinterland depends in large measure on continuing upgrade and extension of the north-south road corridor. The road Yerevan – Ashtrak – Gyumri – Vanadzor

<sup>5</sup> At the 2019 Global Competitiveness Report, Armenia’s railroad infrastructure density is ranked 36 globally and its efficiency is ranked 67, while its road infrastructure is ranked 107.

<sup>6</sup> The same is not true for BRI corridor route 2 from Georgia as it travels through Azerbaijan.

– Dilijan makes for good connections with hinterland in the northern side, Yerevan – Artashat – Yeghegnadzor – Goris – Kapan on the southern side and Yerevan – Artashat – Gavar (near the Sevan lake), in the central part. Furthermore, if Russian, Indian and West Asian shippers find it profitable to use the Iran-Armenia route to connect to each other because it is quicker and more predictable, a larger share of this transit traffic can flow through this route, too. Armenia’s own trade and investment with Southeast Asia can rise, too.

**15. There are several gaps in road and rail connection northward and southward that provides Armenia’s main cross-border transport.** This includes expansion of the dry-port/terminal at Agarak and the upgrade of the southern part of north-south corridor near Megri. The planned Armenia-Iran rail route is probably one of the costliest infrastructure gaps given the difficult terrain; it has been on the drawing board since 2013, but decision to proceed with construction has not happened yet, partly also reflecting the difficult political realities in the region.<sup>7</sup>

#### 4. Estimates of BRI Impact on Shipment Time and Trading Cost

**16. The completion of BRI transport projects around the world<sup>8</sup> will complement the impact of the infrastructure upgrades in Armenia and along the BRI corridor routes in the region.** The BRI transport projects in different parts of the world increases the number of rail<sup>9</sup> and port connections in the global transport network, improves the speed of travel along upgraded or newly-built rail segments and seaports of the network, and adds to the available options on routes for shippers to reach their destinations. Because all countries are linked to each other through the global transport network, any fall in a country’s shipment time in one region due to BRI transport projects in that region affects the shipment time of countries in other regions as they are part of the same global network. Armenia’s average shipment time with its trading partners falls not only because of its access to the BRI corridors routes, but also because of transport projects in countries of other regions in the global transport network<sup>10</sup>. If BRI investments in ports of Poti, Batumi in Georgia and Bandar Abbas in Iran (which serve around 60 percent of the Armenian trade) improve their capacity and operational efficiency, Armenia’s shipment time through those ports will improve too; if there are BRI investments in other ports in other regions they will contribute to lowering its shipment time further.

**17. Trading times currently are relatively high and are expected to decline slightly as envisaged BRI projects are completed.** It currently takes more than 15 days for Armenian traders to deliver and receive goods from BRI partner countries; and 32 days in the case of trade with China. The completion of ongoing and planned BRI transport projects around the world is estimated to lower Armenia’s average shipment time by up to 2.8 percent<sup>11</sup>. Among the BRI countries, this is one of the lower reductions in shipment time, which is not surprising given that it is not on any BRI corridor routes.

**18. Trade cost will fall too.** Shipment time<sup>12</sup> affects trade flows just as tariffs and freight costs do, because customers and firms’ value accessing goods in a timely manner, and any delay in serving different

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<sup>7</sup> An alternatively north-south rail route is being promoted that will connect Iran to Azerbaijan.

<sup>8</sup> BRI transport projects around the world have been compiled into a list in De Soyres 2018 and Reed and Trubetskoy 2019.

<sup>9</sup> Most international trade is carried by sea, with rail as the second most important mode of transport and so estimates of shipping time is based on the impact of BRI rail and port projects only.

<sup>10</sup> The BRI is estimated to reduce the average shipping time for all country-pairs in the world from 22.9 days to 22.3 days (upper bound), a reduction of 15 hours (2.7 percent). The estimate also includes countries that have no BRI transport-projects.

<sup>11</sup> The case study cites upper bound estimates assuming shippers can switch transport modes from maritime to rail when BRI improvements in transport infrastructure make such switching optimal.

<sup>12</sup> Trade costs equals the sum of the cost of tariff, the cost of freight and cost of shipment-time, expressed in ad valorem terms.

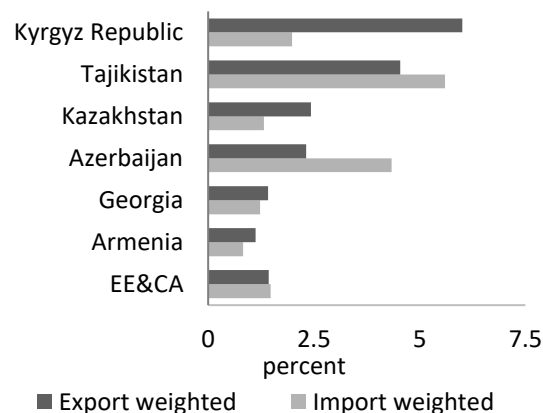
markets reduce trade flows. Reductions in shipment time through either improvement in transport infrastructure and/or in the efficiency of border-crossing will lower trade costs too. However, the same fall in shipment time in two countries can generate differing magnitudes of decline in trade costs because some goods are more time-sensitive than others and the composition of trade in respect of such goods may differ in the two countries. Armenia’s export-weighted trade cost is estimated to fall by a little over 1 percent when the underlying reduction in shipment time is 2.8 percent.

Table 3: Investments will lower the time to trade as well as the costs of trade

	Average time to trade to		Reduction in time to trade	
	BRI	China	Lower bound	Upper bound
<b>ARM</b>	15.5	32.1	2.2	2.8
<b>AZE</b>	13.8	22.5	6.1	7.1
<b>GEO</b>	14.6	32.6	2.6	3.5
<b>KAZ</b>	15.4	12.0	4.4	8.3
<b>KGZ</b>	20.7	15.2	8.5	12.9
<b>TJK</b>	18.7	31.7	3.0	3.9
<b>UZB</b>	17.3	27.0	13.6	15.2

Lower bound refers to a scenario of preference for maritime links. In the upper bound, this preference is removed.

Source: Baniya et al 2019



Source: Constantinescu et al (2019), unpublished

**Box 3: Electricity and ICT infrastructure and gaps\***

The analysis in this note is focused on transport connectivity and economics; however, other infrastructure will also be important for countries to be able to reap the benefits of improved transport connectivity and this box provides some information on the infrastructure and gaps in energy and ICT.

**Energy.** Armenia has sufficient generation capacity to meet the electricity demand. The overall operational performance of the sector is adequate with a low level of electricity losses and strong payment discipline. There has been almost full electricity bill collection since 2003. The technical electricity losses in transmission were 2.1 percent in 2018; 8.1 percent in distribution with almost no commercial losses. The quality of electricity service, however, has deteriorated since 2013 with an increase in the number of outages at the distribution level, which could reflect under-investment in distribution. The country-wide System Average Interruption Frequency Index (SAIFI, number of outages per consumer) increased from 5.2 in 2012 to 9.2 in 2018. Similarly, the country-wide System Average Interruption Duration Index (SAIDI, outage duration (hours) per consumer) deteriorated from 8.7 in 2013 to 14.7 in 2018. The country is ranked 30 globally at the “Getting Electricity” indicator in the Doing Business 2020 ratings, outperforming a number of countries in the ECA region. At the same time, businesses ranked Armenia 77 (out of 137 countries) on the quality of electricity supply in the 2017-18 World Economic Forum Global Competitiveness Report also suggesting room for improvement.

Nuclear, hydro and thermal, each provides around a third of the country’s power generation. Wind and solar account for less than 1 percent of total electricity, though the Government plans to expand their share to 10 percent by 2026, which would require building 700MW of solar capacities by then. Some of the sector’s generation capacity is beyond their working life and uneconomic, and needs to be replaced soon, like the Hrazdan Thermal Power Plant (TPP). With the ongoing upgrade, the transmission capacity between Armenia and Iran is expected to reach 1,000-1,200MW (up from 350MW currently) and allow for significant increase in exports to under the existing gas for electricity swap agreement. The Georgia-Armenia interconnection project is also underway, which would increase the transmission between these two countries to 350MW.

The power sector is fully unbundled with the distribution company as a single buyer and is regulated by an independent and competent regulator. Tariffs are at cost-recovery levels with full pass-through of costs to the end-users and are regularly reviewed unilaterally by the Public Services Regulatory Commission or with the tariff revision claims of power sector companies to avoid jeopardizing the financial health of the sector.

**ICT.** Armenia's international IP connectivity market is served by five operators, landing approximately 200 kbps per capita international capacity in the country, a 14-fold increase between 2013 and 2018. Being a landlocked nation, Armenia sources its connectivity through terrestrial connections with Georgia and Turkey, based on bilateral agreements between operators. The dependence on operators in other countries (who themselves are buyers of capacity very often) for international connectivity is seen as a vulnerability to the sector in Armenia. This dependence was solely on Georgian operators in the past, but increased interconnections with Turkey have improved redundancy of international connectivity in Armenia.

The three mobile and two fixed telecommunications services providers have built extensive backbone networks across the country, with certain Over-the-Top service providers and IPTV service providers have also laid their own network between major cities. New entrants in the telecommunications market have further developed the transit business in Armenia, strengthening international links and relationships with carriers. It is estimated that the total transit capacity in Armenia has outgrown the international IP capacity consumed domestically. The development of two parallel connectivity corridors through Turkey and Georgia, strengthens the ability of the sector in Armenia to capture the benefits of connectivity corridors that can be developed as part of the BRI.

Armenia has an independent multi-sector regulatory authority that also regulates the telecommunication sector. While no urgent regulatory issues were highlighted by the private sector, there is potential to improve on promoting non-discriminatory and fair access to networks and passive infrastructures. Furthermore, the regulator can play a stronger role in assessing significant market power in key markets and implementing remedies to promote greater competition.

\*/ Energy information based on Aldayarov et al (2017); ICT on Raja (2019, unpublished).

## 5. Potential Economic Impact of the BRI

**19. BRI transport projects in the region and around the world will have a favorable impact on Armenia's trade, FDI and GDP, even though there are no such projects in its territory.** In trade, the BRI induced fall in shipment time and trade cost will raise total exports and change its composition towards more time-sensitive items. Higher FDI inflows into increasingly profitable opportunities in such items and greater access to imported inputs are likely to boost productivity and GDP. The government of Armenia can, however, magnify the BRI impact on trade, FDI and GDP if BRI improvement in transport is accompanied by complementary reforms in several areas. This would include reforms that improve trade-facilitation arrangement and logistics, remove entry barriers in the tradable sectors while strengthening competition and bring back long-term unemployed into the labor force. This note presents the results of the analysis undertaken prior to the COVID-19 pandemic and does not take capture the ongoing discussions about near-shoring production and reconfiguring global value chains. While the COVID-19 impact is likely to be profound, the case for international trade, through differences in comparative advantage, specialization and economies of scale, remains strong.

### Recent Trade Flows

**20. Prior to the COVID-19 pandemic, Armenia's trade had been growing.** Foreign merchandise trade increased from around US\$1.2 billion in 2000 to around US\$7.4 billion by 2018. Total trade in goods accounts for close to 60 percent of GDP in 2018. The country has been running a sizeable goods trade deficit with imports increasing from US\$0.9 billion in 2000 to almost US\$5 billion in 2018. Exports reached US\$2.4 billion by 2018. More than half of total exports comprise of metals, around 30 percent agriculture

and processed foods and 12 percent manufactures like clothing, pharmaceuticals, and machinery etc. Armenia runs a surplus on its services account, reflecting also growing exports of tourism and ICT services, while the large immigration and diaspora contributed strong income inflows. The surplus on both accounts have moderated slightly in recently.

**21. Though Armenia is geographically quite distant from China and overland BRI corridors have contributed little to improving its connection there, China’s share in its total trade has been increasing.** While trade with China was negligible in 2000, China accounted for more than 10 percent of total trade by 2018, reflecting stronger gains on the imports side (where China accounted for 13 percent of all imports), compared to the exports side (where China has a 4 percent share). Share of trade with Russia rose by 11 percentage points during the same period, but with EU it fell by 12 percentage points.

Table 4: Share of Major Trading-Partners in Armenian Trade  
(in % of total)

	EU		Russia		China	
	2000	2018	2000	2018	2000	2018
<b>Total Trade</b>	36.8	24.9	15.3	26.1	0.5	10.4
<b>Total Imports</b>	36.8	23.2	15.5	25.3	0.6	13.3
<b>Total Exports</b>	36.8	28.3	14.8	27.6	0.2	4.4

Source: IMF, Direction of Trade

**22. In terms of composition of exports to China, Armenia has only a few products of meaningful export size.** Copper ore accounted for most of its exports to China (around 90 percent). Other exports (medical equipment, alcohol beverages) are largely negligible.

### Impact on Exports

**23. The completion of BRI transport projects is estimated to increase Armenia’s total exports by up to 2.1 percent<sup>13</sup> (Baniya et al 2019).** This places Armenia in the middle of the 70 BRI countries for which estimates of potential impact on exports are available. This reflects also the relatively modest reduction in the shipment time for Armenia. At the same time, complementary reforms in trade facilitation and logistics can magnify the estimated impact of BRI. In fact, in case border delays along BRI routes are helved, Armenia’s exports could rise by 10 percent, almost five times the impact from that of transport projects alone. Other scenarios<sup>14</sup> also offer opportunities to increase exports; for example, if transport improvements are accompanied by stronger efforts to improve market access (lowering tariff rates among BRI countries by half), Armenia’s export could increase by almost 7 percent.

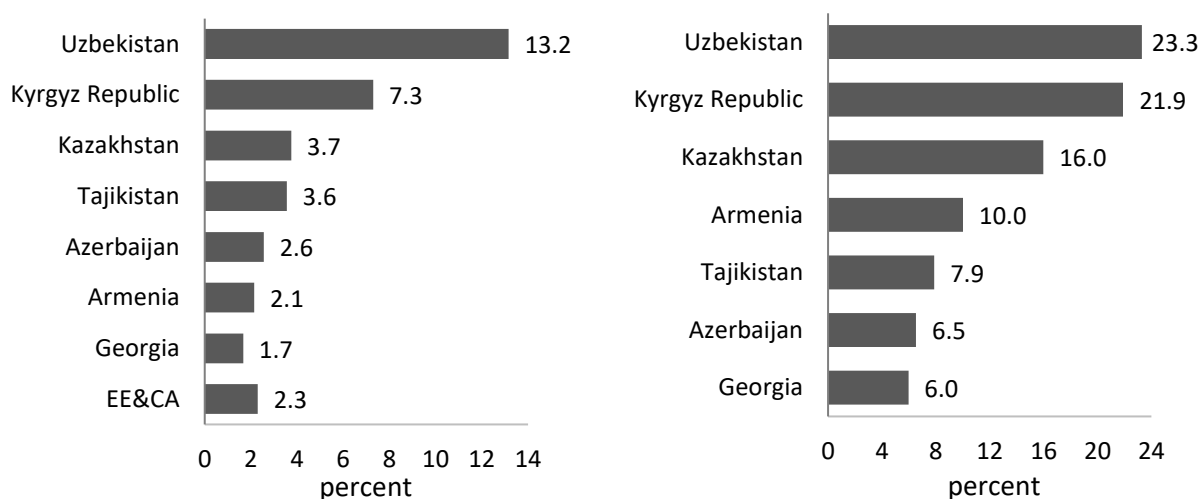
**24. The completion of BRI projects will also affect the composition of exports, shifting the composition in favor of time-sensitive goods.** Baniya and other (2018) finds considerable variation in the responsiveness of exports to shipment time reduction across 15 groups of BRI-countries’ exports with some exports many times more responsive than others. The list of 15 includes the following product groups in descending order of export responsiveness to shipment time: wood products, glass products, vegetable products, mineral products, raw hides, skins and leather, animal products (e.g. meat), chemicals, metals, textiles, electrical machinery, transport equipment and footwear. Maliszewska and Van der Mensbrugge (2019) use a richer CGE model, where BRI-induced reductions in cost of imported inputs generate a reallocation of specializations across countries. The highest percentage increases were

<sup>13</sup> Total exports between BRI countries are estimated to rise by 5.2 percent. These estimates here refer to upper-bound estimates based on the assumption that shippers can switch transport modes from maritime to rail when BRI improvements in transport infrastructure make such switching optimal.

<sup>14</sup> Scenarios analyzed include more efficiency corridor management, deepening trade agreements and improving market access.

for the following product groups: 50.1 percent for transport equipment, 38.6 percent for leather goods, 18.4 percent for machinery, 16.2 percent for wood products, 15.8 percent for metals, 13.6 percent for wearing-apparel, 8.6 percent for agriculture, 5.8 percent for textile and so on; coal, oil and gas has the lowest increase due to reduced shipment time with others being somewhere in between.

Figure 3: Trade is expected to increase, but much more if complemented by trade facilitation reforms (in %) (in %, assuming 50 percent reduction in border delays and no maritime preference)



Source: Baniya et al. 2019

**25. Notwithstanding the strong response of a number of product groups to reduced shipment time, not all of them will translate into strong export growth for Armenia.** That will depend on which ones line up with its comparative advantage and on having adequate external demand. Agriculture, processed food, and metals line up well with Armenia’s comparative advantage and favorable external demand, but Armenian capacity to expand output and exports in a sustained way may depend on policies to remove constraints to the expansion of these sectors.

### Impact on FDI

**26. The BRI is expected to increase overall FDI inflows to BRI countries.**<sup>15</sup> First, a reduction in shipment time raises competitiveness of exports, especially of those that are more time-sensitive, and thus encourages additional foreign investment in them. Second, under the BRI, outward FDI from Chinese private and state enterprises to BRI countries is encouraged and is, in many cases, part and parcel of BRI efforts to catalyze trade and growth in these countries and promote deeper integration in general, and with China in particular. Recent estimates of the BRI impact on FDI (Chen and Lin 2018) confirm that reductions in shipment time would raise overall FDI as well as FDI from China. In fact, a 10 percent reduction in shipment time is expected to increase overall FDI flows into BRI countries by 12 percent on average, and Chinese FDI flows into them by 7 percent. The study estimates that fall in shipment time will raise total FDI to Armenia by 2.3 percent.

**27. Total annual FDI inflows to Armenia from China is negligible.** IMF’s CDIS database on FDI stocks confirms this with virtually all of Armenia’s FDI stock owed to EU and Russia in approximately equal

<sup>15</sup> Systematic information on Chinese FDI by value and sector and source (private or SOE) are not available for countries in the CAC region unlike Sub Saharan Africa (SSA)

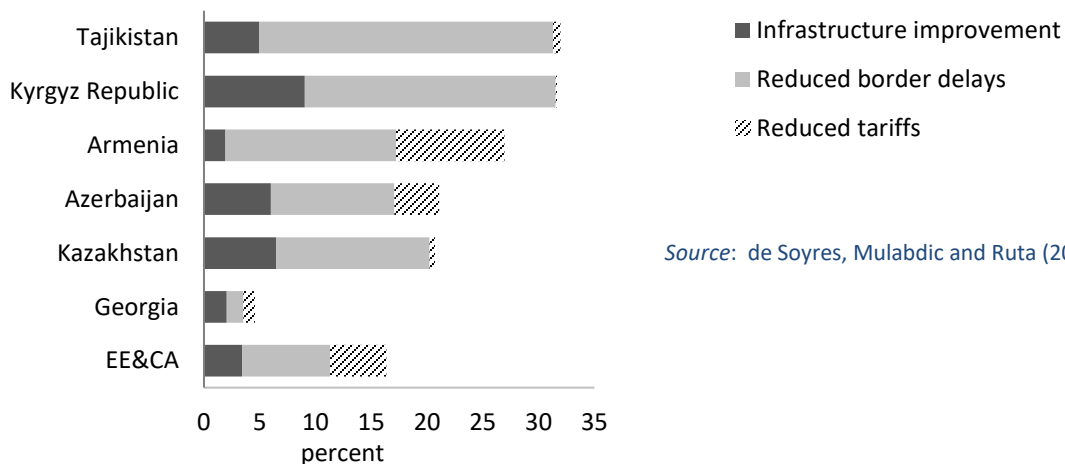
measures. The Global Investment Tracker data compiled by AEI & Heritage Foundation is another public source of China’s FDI data but it does not report FDI stock from China in Armenia. UNCTAD’s database on bilateral FDI statistics also confirms the low level of Chinese FDI in Armenia, at least until 2012. According to the Central Bank of Armenia, Chinese FDI continues to be low.

**28. Still, Chinese capital and businesses have been operating in the country for some time.** Chinese businesses could be found in wholesale and retail trade as well as in the manufacture of household electrical appliances, clothing and rubber products (Babayan 2014). Furthermore, Chinese companies are contractors on some of the activities on the north-south corridor improvement.

Impact on GDP

**29. Lower shipment time generates higher exports and attracts more FDI which in turn improves productivity and raises GDP.** It can also lower prices of imported inputs with the resulting fall in production cost passed on to downstream industries thereby reallocating specialization and raising productivity and GDP. (De Soyres, Mulabdic, and Ruta, 2019), using a structural general equilibrium model (SGE), estimate the impact of improved infrastructure alone on Armenian GDP at around 2 percent compared to the baseline; while improving trade facilitation adds an additional 15 percent. Further gains in GDP of around 10 percent could be achieved through lowering tariffs, bringing the total gains from improved infrastructure and trade policy and facilitation to 27 percent.

Figure 4: Increases in GDP  
 (in % from baseline, SGE model analysis)



Source: de Soyres, Mulabdic and Ruta (2019)

**30. Taking into account the cost of building the infrastructure lowers the gains, though they still remain positive in the case of Armenia.** The welfare impact<sup>16</sup> is calculated by comparing the long-term real income gains noted above with an estimate of the infrastructure cost that the country is expected to pay. This adjustment lowers the welfare gain for Armenia to around 20 percent in a scenario of improved infrastructure, combined with reduced border delays and lowering of tariffs.

<sup>16</sup> In the SGE model, welfare is defined as total consumer revenues divided by the relevant consumption price index. Total revenue takes into account payments to factors of production, revenues derived from the portfolio share and from import tariffs, and the cost of the transport infrastructure.

## Spatial Impact of BRI

**31. Spatial analysis suggests that benefits of improvements in transport are likely to be associated with regional concentration of economic activity.** Economic growth is unbalanced (World Bank, 2009); for example, urban hubs that are closer to border-crossings will gain disproportionately more while those farther away will be relative losers. At the same time, transport improvements alone cannot offset disadvantages of unattractive locations. Cities and regions with better amenities and a significant manufacturing sector can benefit substantially more because of the potential for increasing returns and agglomeration economies.

**32. Similarly, improvements in BRI connectivity are likely to be associated with more spatial concentration, rather than dispersion of economic activity within countries.** Most of the gains expected from the improved connectivity do not accrue from the direct impact of the reduction in trade costs, rather, they accrue from income gains related to the response of economic agents which tend to increase scale and to benefit from agglomeration by locating near other firms engaged in similar and related activities. The results of a spatial general equilibrium model<sup>17</sup> for Central Asia confirm these results suggesting that economic adjustment generates gains overall, but also winners and losers. Under the baseline scenario (limited adjustment), the model finds that overall gains will be limited to the direct impact of reduced trade costs. However, some economic mobility (allowing firms to enter and exit) brings higher benefits for some countries, though overall gains are smaller. Finally, allowing firms and labor to adjust increases the overall gains for the entire region with some countries benefiting significantly more; however, some countries gain much less. Such a differentiated spatial impact also increases risks for part of the population.

**33. Given Armenia's economic structure, this may mean bigger opportunities for some regions compared to others in an environment where there is already evidence of substantial spatial divide.** Specifically, urban centers with greater manufacturing base and agglomeration potential are likely to benefit more while some districts could easily see a fall in income. Yerevan and few other locations are likely to benefit, though it is unclear how prepared these locations are to build on the available opportunities. At the same time, other secondary cities and rural areas could face challenges. In addition, even in those urban areas that benefit, note everyone will gain as industries that will face greater competition (for example, manufacturing) could lose jobs.

## 6. Complementary Policies to Accompany BRI Investment

**34. The estimates of BRI impact make clear that notwithstanding the importance of better transport infrastructure for trade and development of Armenia, only with complementary policies can it maximize its benefits from BRI investments in transport in the region.** This is particularly relevant where border crossing is slow due to inefficiencies in trade facilitation and logistics or where the entry barriers to tradable sectors are preventing investment or where sector scale constraints are preventing it from responding adequately to external demand, for example in food processing or in metal products or in chemicals.

- a. *Reform in trade facilitation and logistics to reduce border delays:* While border-crossing and customs procedures have improved in Armenia, a few issues continue to constrain the

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<sup>17</sup> The model analysis few scenarios of economic adjustment: a) Armington, where it is assumed that producers and consumers change behavior while number of firms remains unchanged; b) monopolistic competition where firms' entry and exit is allowed and c) increasing returns and labor mobility.



improvement of logistics performance. For example, the National Single Window System (NSWS) is yet to be rolled-out to all agencies engaged in foreign trade, and as a consequence information and documentation exchange between governmental authorities is not integrated. Controls at border crossing points are not risk-based resulting in long delays as trucks entering to Armenia are systematically inspected at the border. The planned introduction of Authorized Economic Operator (AEO) will simplify trading; however, progress has been limited. The electronic declaration system is in place, yet not fully implemented as the State Revenue Committee (SRC) requires in some instances hard copies of documents to be submitted.

- b. *Policies to remove entry barriers and enhance competition:* Armenia ranks a respectable 47 position at the 2020 Doing Business report. However, limited improvement in areas not captured by the Doing Business report (state capture, vested interests, rule of law) has limited the emergence of a vibrant private sector. As a result, firm entry was low. There is evidence that recent political changes are making a difference in this area and have set the stage to implement reforms aimed at removing barriers to entry in the tradable sector, increasing competition and raising profitability. This will include measures to improve contract enforcement and to address anti-competitive and monopolistic behavior of firms. With a more competitive tradable sector, investment and output will grow and raise productivity in tradable sectors.
- c. *Policies for expanding agricultural output for exports:* While the potential in agriculture is significant, output in the sector has been declining for a number of years reflecting both lower inputs as well as lower yields. Policies to promote sustainable pasture management, and to improve irrigation services for high-value crops could reverse the trend. Improved connectivity with hinterlands is needed to better connect farmers with markets and processors. Also, policies to promote innovative digital platforms that improve farmers' access to finance, advisory services and information on output-prices and weather could bring down transactions cost. These policies could generate conditions for sustained increases in agriculture, especially in high value crops.
- d. *Stronger regional cooperation:* The gains from investment in Armenia's network can be amplified if similar upgrades are undertaken along the entire corridor. In addition, an efficient border-clearance service in Armenia will do little to improve the reliability of the corridor if not matched by similar improvements in processes along the entire route. This calls for stepped-up cooperation between countries. While, there has been no lack of cooperation initiatives in South Caucasus and Central Asia, these appear to have had only limited usefulness. The CAC economies are parties to numerous trade and transport facilitation frameworks which aspire to create frameworks for more efficient trade and economic integration.<sup>18</sup> However, selective coverage of trade and transport issues, complex rules, as well as lack of functioning dispute resolution mechanisms have limited their effectiveness. To strengthen regional cooperation, countries will need to build on the existing arrangements, but also establishing new ones. In the case of Armenia, closer cooperation with Georgia and Iran will be critical to make the north-south route a viable corridor.

## 7. Fiscal Risk of Scaling-Up Public Investment for BRI Infrastructure

**35. While Armenia has no BRI transport projects and no borrowing from China, still, the fiscal impact of scaling-up public investment to meet its own transport infrastructure needs to be managed.**

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<sup>18</sup> These include: the Eurasian Economic Community; the Shanghai Cooperation Organization; the Economic Cooperation Organization; the Transport Corridor Europe-Caucasus-Asia (TRACECA), the Central Asia Regional Economic Cooperation (CAREC) and so on.

Completing ongoing and planned road and rail investment in the coming years is important for maximizing benefits from BRI improvements in transport connectivity in neighboring countries and around the world. They would have to be financed by borrowing from various multilateral sources and in some cases through PPPs, all potentially adding to total public debt.

**36. Armenia’s fiscal situation has been tight since the global financial crisis, constraining public investment and external borrowing; the COVID-19 pandemic will put additional constraints.** The fiscal performance worsened after 2014 with the dramatic slowdown in regional growth, especially Russian growth. Fiscal deficit rose from an annual average of 2.6 percent of GDP in 2010-13 to around 4 percent of GDP in 2014-17 and public debt rose from 41 percent in 2013 to its peak at 59 percent in 2017, partly due to the depreciation of the dram during 2014-2015. With government debt above 50 percent of GDP, the fiscal rule<sup>19</sup> mandated a relatively rapid fiscal consolidation.<sup>20</sup> The consolidation picked-up pace in 2018 and 2019 helping reverse the trend in increasing public debt; however, the COVID-19 pandemic is reversing these gains as the economic contraction and the widening of the fiscal deficit expected to push debt to around 60 percent of GDP by end-2020.

**37. The fiscal consolidation in recent years has constrained the scaling up of public investment, despite the availability of external financing for infrastructure.** Public investment averaged a relatively low 2.8 percent of GDP a year in 2014-17, around the same rate as in 2010-13. Fluctuations in GDP growth, revenue collection or current spending, has often squeezed annual public investment spending and delayed implementation of ongoing externally funded projects. The result is rising undisbursed balances on existing project loans (e.g around 13 percent of GDP in 2018) which constraints the government’s ability to take on new public investments.

**38. Armenia’s baseline debt-sustainability scenario envisages a sharp increase in public debt in response to the COVID-19 pandemic but a decline to more sustainable levels over the medium-term as the authorities remain commit to the fiscal rule.** Under this scenario, the fiscal deficit will increase to around 5 percent of GDP in 2020 while public debt spikes to around 60 percent of GDP; as the economy recovers and the fiscal balance is consolidated, debt is expected to return to current levels of close to 50 percent of GDP by 2025. Annual public investment is expected to gradually increase to 5 percent of GDP, a significant improvement from less than 3 percent in recent years even if insufficient to close the major infrastructure gaps. The baseline is however contingent on reducing, as a share of GDP, non-interest current spending and raising revenue collection. Without such ongoing fiscal consolidation, the public investment rate would need to be lower. At the same time, a faster recovery from COVID-19 pandemic may open some space for higher investment.

**39. Additional investments for BRI are unlikely to generate sufficient growth to off-set the impact of higher borrowing on the debt-to-GDP ratio.** Bandiera and Tsiropoulos (2019) estimate that the implementation of all capital expenditures needed to better link Armenia to BRI corridors over the next five-year period will increase investment levels by around 5 percent of GDP per year but generate additional GDP growth of only around 1-1.4 percent. They also conclude that the public debt to GDP ratio in 2030 in this scenario will be higher compared to a scenario excluding these investments, though they note that the ratio in 2030 will be lower compared to its current values under both scenarios. In addition,

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<sup>19</sup> The Fiscal Rule adopted in 2008 stated that if government debt exceeds 50 percent of previous year GDP, the fiscal deficit for the next year would be reduced to 3 percent of the average nominal GDP of the previous three years, and if it exceeds 60 percent of GDP, no further debt can be issued. Following to this rule, in 2016, when the debt level exceeded the 50 percent threshold, the government planned to reduce its deficit from 5.5 percent of GDP in 2016 to 2.8 percent of GDP in the 2017 State Budget Law.

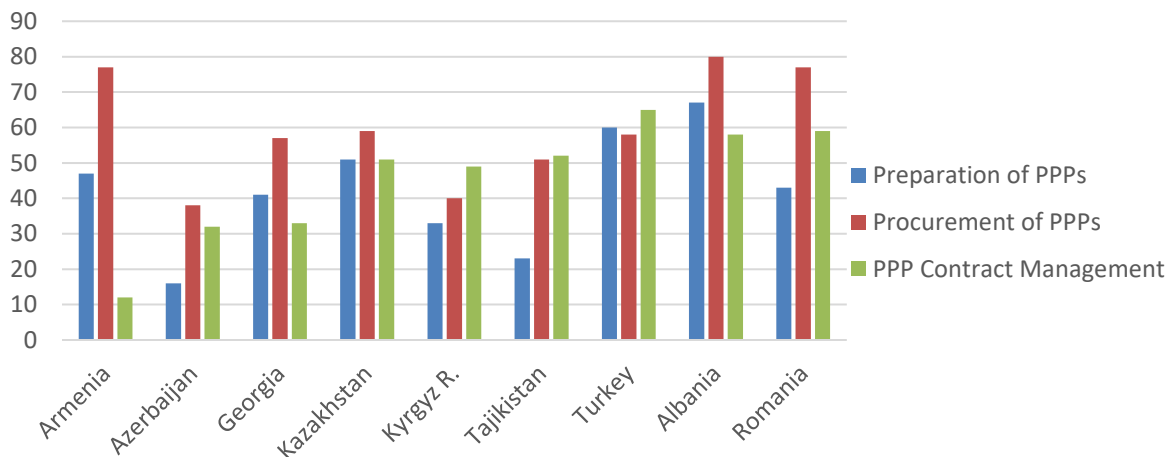
<sup>20</sup> Even though the fiscal rule has been amended at the end of 2017 and now provides more flexibility in the fiscal adjustment, the authorities have remained committed to the consolidation path announced earlier.

they also highlight a number of fiscal risks associated with large investment projects (cost overruns, delays, overestimated benefits and so on) which, if they materialize, could affect the debt position of BRI countries, including Armenia.

**40. Armenia could strengthen its fiscal institutions along a few dimensions to minimize the risk of fiscal instability from infrastructure investments.** First, given the multi-year implications of scaled up infrastructure investments and their recurrent spending requirements, better integration of its medium-term expenditure framework (MTEF) with the actual budget processes could avoid frequent reallocations and/or delays in project-execution. Second, with growing reliance on different financing modalities for infrastructure investments, including PPPs, improve further the fiscal risk management as currently this function remains somewhat basic. Third, strengthen the Public Investment Management Framework so as to better prioritize/select projects and link them with government priorities. Given significant under-execution of capital spending, improved PIM should be a priority. Fourth, with improvements along the above lines, the authorities could consider amending the fiscal rule to allow more fiscal space for well-designed and implemented public investment projects.

**41. The role of the private sector in infrastructure provision could also be strengthened.** Armenia has been accumulating experience with private sector participation in infrastructure. The World Bank’s database on Private Participation in Infrastructure lists around 15 different projects, including projects in transport (airport and railway concessions), power, ICT and water and sewerage and mostly prior to 2008. In the last decade, there have been only three projects, two in energy and one in water. The new PPP framework opens up opportunities for a more vibrant private sector engagement in infrastructure. However, this would require stronger capacity to analyze projects, share risks as well as disclose and manage those risks. In addition, sector policies would need to be amended to ensure efficient pricing and regulation. According to the World Bank Procuring Infrastructure PPPs, Armenia’s performance on procurement of PPPs is above average for the sub-region, with considerable scope to reach performance levels of more advanced peers.

Figure 5: Quality of PPP processes  
 (score, on a scale from 0 to 100, higher values indicate better performance)



Source: World Bank Procuring Infrastructure Public-Private Partnership

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Annex: BRI Transport Projects in the Central Asia and Caucasus Region

BRI Transport Projects	New, Upgrades and Expansion	Countries	Status: Operational, Ongoing, Planned
Urumqi-Khorgas rail proj.	Urumqi-Khorgas new rail link	China	-2012
Khorgas New Dry Port	New Rail Terminal, Truck Terminal, Logistics Center & Free Trade Zone	China, Kazakhstan	-2012 (partly) -2015 (fully)
Moscow-Kazan rail proj.	Moscow-Kazan High Speed Rail upgrade	Russia	-Under construction
Khorgas-Aktau Rail Project	-Khorgas-Zhetigan (293 km) -Jezkazgan-Saksaulsky (546 km) -Beyneu-Salkar	Kazakhstan	-2014 -2014 -2016
Aktau Seaport Expansion	-Sealink -Container port -Expansion of Port Facilities	Kazakhstan	-2000 -2014 -Under construction
North South Uzen-Gorgan rail proj.	-Uzen-Bolashak -Serkhetyaka-Bereket- Iran border -TKM border-Gorgan	Kazakhstan Turkmenistan Iran	-2013 -2014
Baku-Alyat seaport	-Sea-link to Aktau -Sea link to Turkmenbashi	Azerbaijan, Kazakhstan Turkmenistan	-2014 -2016
Baku-Tbilisi-Kars-Istanbul rail proj.	Baku-Tbilisi upgrade Tbilisi-Kars new rail segment	Azerbaijan, Georgia Georgia, Turkey	-2016 -2017
Marmaray Tunnel	Marmaray rail project	Turkey	-Under construction
Kashgar-Pap Tashkent rail project	Kashgar-Irkeshtam-Osh rail proj Angren-Pap rail link to Tashkent	China, Kyrgyz Republic Uzbekistan	-Proposed -2015
Samarkand-Mashad rail	Samarkand-Mary-Saraks-Serakhs-Mashad upgrade	Uzbekistan, Iran, Turkmenistan	-2016
Mashad-Tehran rail Upgrade	Mashad-	Iran	-Ongoing
Kashgar-Dushanbe rail proj.	Kashgar-Irkeshtam-Karamyk-Dushanbe new rail link	China, Kyrgyz Republic, Tajikistan	-Proposed
SherKhan_Herat rail	SherkhanBandar-Kunduz-MazareSharif-Herat new rail & upgrade	Afghanistan	-Under construction
Dry ports and hubs			
Atyrau, Shymkent, Astana, Almaty		Kazakhstan	Except for Astana, proposed for modernization & expansion
Andijan, Samarkand, Bukhara		Uzbekistan	
Bishkek, Osh		Kyrgyz Republic	
Tursunzade, NiznyPanj, Jirgital		Tajikistan	

Source: Reed & Trubetsky (2018) compiled a list of BRI projects from which projects in the CAC region are cited