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CHAPTER

1 Introduction

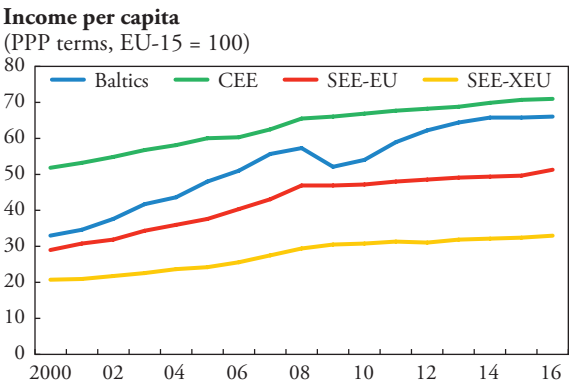
Income convergence toward European Union (EU) levels has slowed significantly in the Western Balkans, a concerning prospect given the region's low development. Western Balkan incomes now stand at about 30 percent of EU-15 incomes; moreover, this share has not changed much since the onset of the global financial crisis, and has increased only by about 12 percentage points since the early 2000s (Figure 1.1).[1,2] This contrasts with other regions of Eastern Europe, where incomes continue to catch up faster. As IMF (2015) showed, a lack of competitiveness has been the key reason behind the recent stagnation. Many factors contribute to this lack of competitiveness: an unfinished transition, with some countries still reeling under the weight of inefficient state-owned enterprises; a questionable business environment; emigration and the related brain drain; and impaired banking sectors since the crisis. This paper looks at another key factor: the level and quality of public infrastructure in the region.

Shortages of core public infrastructure can be a significant obstacle for higher economic growth and faster income convergence. Specifically, (1) inadequate transportation networks, both in terms of coverage and quality, can severely constrain connectivity of producers and consumers to global and regional markets; (2) insufficient or unreliable provisions of utilities (for example, water and energy) can restrict production capacity and undermine

[1]EU-15 countries include: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

[2]The following regional aggregates and country codes are used throughout the paper: Baltics (blue): Estonia (EST), Latvia (LVA), Lithuania (LTU); Central Eastern Europe (CEE, green): Czech Republic (CZE), Hungary (HUN), Poland (POL), Slovak Republic (SVK), Slovenia (SVN); the Commonwealth of Independent States (CIS, purple): Belarus (BLR), Moldova (MDA), Russian Federation (RUS), Ukraine (UKR); Southeast Europe EU members (SEE-EU, red): Bulgaria (BGR), Croatia (HRV), Romania (ROU); Southeast Europe non-EU members, or Western Balkans (SEE-XEU, orange): Albania (ALB), Bosnia and Herzegovina (BIH), Kosovo (UVK), FYR Macedonia (MKD), Montenegro (MNE), Serbia (SRB).

Figure 1.1. Income Convergence



Source: Eurostat.
Note: CEE = Central Eastern Europe; EU = European Union; SEE-EU = Southeast Europe EU members; SEE-XEU = Southeast Europe non-EU members.

an economy's attractiveness for foreign and domestic investors; (3) underdeveloped communications networks can slow dissemination of information and knowledge; and (4) underinvestment in human capital and innovation can constrain productivity and hamper competitiveness. While investing in other developmental objectives—for example, health and education—would also enhance long-term growth in Western Balkan countries and help narrow income gaps with their peers, focus on infrastructure shortages is particularly warranted given the region's poor rankings along this dimension. The 2016–17 *Global Competitiveness Report* ranks countries in the region at the average rank of about 85th place (out of 138 countries) on infrastructure, compared with 58th and 69th positions on health and primary education and higher education

An increase in public infrastructure investment has both short- and long-term effects on economic activity (see IMF 2014). In the short term, it boosts aggregate demand through fiscal multiplier effects and, given the complementary nature of infrastructure services, by crowding in private investment in the periods ahead. In the long term, it should have a supply-side effect as the productive capacity of the economy expands, especially if the efficiency of public investment (for example, project selection, implementation, and monitoring) is high. Ultimately, good public infrastructure investment raises productivity and potential output and—if appropriately financed—need not compromise debt sustainability over the medium and long term.

However, more is not always better. Weak institutions, inefficient governments, and widespread corruption are often associated with wasteful spending and misallocation of scarce public resources to projects with low economic

viability. Maintenance costs of wasteful infrastructure can be very significant, draining fiscal resources away from more productive uses. Thus, robust institutional frameworks to ensure the proper selection, execution, and monitoring of projects are a critical precondition for infrastructure development to be conducive to stronger economic performance (see Sutherland and others 2009; Crescenzi, Di Cataldo, and Rodríguez-Pose 2016).

This paper takes a regional view of infrastructure development to assess shortfalls of public infrastructure in the Western Balkans and discusses policy options. Analysis in the paper to quantify infrastructure levels finds these gaps to be large in the region. This is amplified by the fact that the quality of the existing infrastructure also falls short. The current infrastructure plans of the countries in the region would help narrow the identified gaps, but residual infrastructure needs are likely to remain substantial. Furthermore, as the paper shows, significant bottlenecks for increased infrastructure investment include a lack of fiscal space, weak institutional frameworks for public investment management, and poor regional coordination. If these challenges are addressed, however, estimations and simulations show that the potential growth benefits from addressing infrastructure gaps are likely to be significant. The growth payoffs can be raised if (1) the efficiency of public spending is enhanced by strengthening institutional frameworks, (2) investment is implemented with a view to enhance regional connectivity and facilitate integration in European supply chains, and (3) financing comes as much as possible from international financial institutions (IFIs) and donors. Greater leveraging of private sector infrastructure investments—including through efficient use of public-private partnership investments—could also play an important role. Regional connectivity projects would help better integrate the region with the rest of Europe, and thereby facilitate EU accession prospects.

The remainder of the paper is organized as follows. The second chapter provides an assessment of the recent evolution of public infrastructure in the Western Balkans in comparison with other European regions. The third chapter complements the historical assessment with a detailed analysis for various sectors and quantifies country-by-country infrastructure gaps. The fourth chapter addresses fiscal challenges constraining a ramp-up in investment and showcases possible options to address it. The fifth chapter lays out various external financing options. The sixth chapter discusses options and conditions for increased use of public-private partnerships. The seventh chapter provides empirical estimates on the impact of higher public capital spending on growth under various assumptions. The concluding chapter makes recommendations on how to narrow infrastructure gaps while preserving fiscal sustainability.

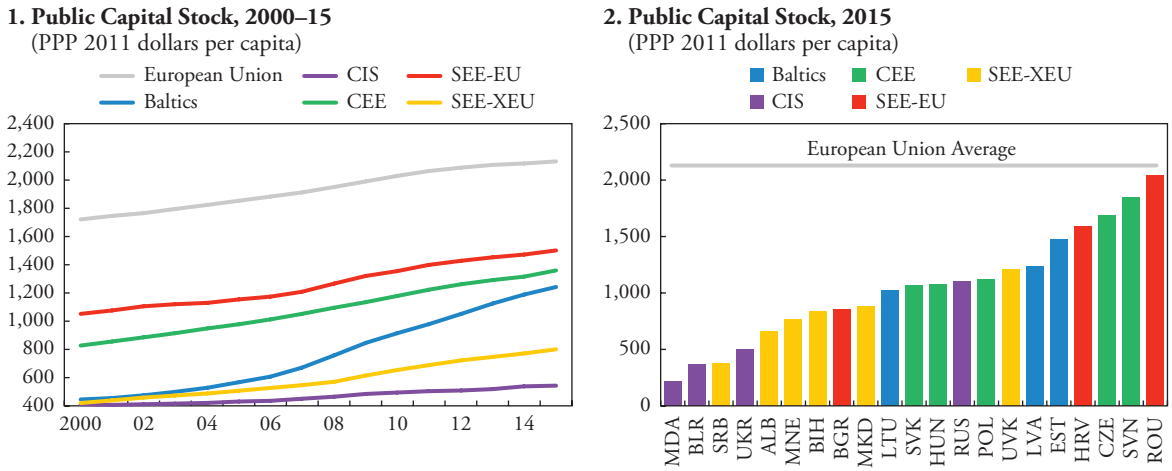
CHAPTER

2 Public Infrastructure in the Western Balkans: The Historical Background

Low stocks and poor quality of public infrastructure in the Western Balkans have a long history. Development of basic public infrastructure in the former Yugoslavia started later than in Western Europe and proceeded at a much slower pace, largely due to the historical political fragmentation of the region. In this unfavorable political and social environment, public infrastructure development was uneven. To facilitate development and narrow the gap with industrialized economies, during the 1970s the former Yugoslavia adopted an ambitious multiyear public investment plan. In the period 1973–79 the stock of gross fixed investment grew at 8.2 percent per year. The overly ambitious investment program generated a sizable trade deficit, which was largely financed by external borrowing, given the lack of domestic savings (see Zizmond 1992; Babic and Primorac 1986). This led to an excessive external debt accumulation and depletion of foreign reserves, which called for a substantial fiscal adjustment to reduce external vulnerabilities and restore debt sustainability. The fiscal adjustment, which started in the early 1980s, materialized in a significant budget contraction and even more drastic cuts in capital expenditures, which contracted at an average annual rate of about 5 percent in 1980–90. After that, the devastating conflicts of the 1990s not only constrained investment but led to the destruction of part of the capital stock.

Following the conflicts of the 1990s, a number of international initiatives were put in place that spurred infrastructure investment. The first was the Stability Pact for the Balkans ("Stability Pact"), signed in 1999 by all major international organizations and donors, largely aimed at supporting a significant surge in public investment (Box 2.1). The EU's involvement in supporting infrastructure development was a key component of its objective to stabilize the political situation in the region. More recently, the accumulation of capital stock has

Figure 2.1. Public Capital Stock



Sources: IMF, FAD database; and IMF staff calculations.
Note: CEE = Central Eastern Europe; CIS = Commonwealth of Independent States; SEE-EU = Southeast Europe EU members; SEE-XEU = Southeast Europe non-EU members.

been strong.[1] Public investment accelerated significantly after 2007, supported by international initiatives (Figure 2.1). The increasing availability of resources provided by the international community has played a catalytical role, by "forcing" Balkan governments to increase the allocation of domestic resources for capital expenditure to match the scaling-up of donor support. The most recent country-led National Economic Programs confirm that Western Balkan countries plan to continue allocating substantial resources to the capital budget in the coming years (see National Investment Priorities, Section 3).[2]

Nevertheless, the region is still well behind. Despite the recent surge in capital spending, the overall capital stock has remained low compared with the EU average and that of other neighboring regions, with the only exception of the CIS countries. This is largely explained by the legacy of underinvestment by the former Yugoslavia and subsequent capital depletion over the 1990s. Albania's protracted isolation has played the key role in its low capital stock legacy.

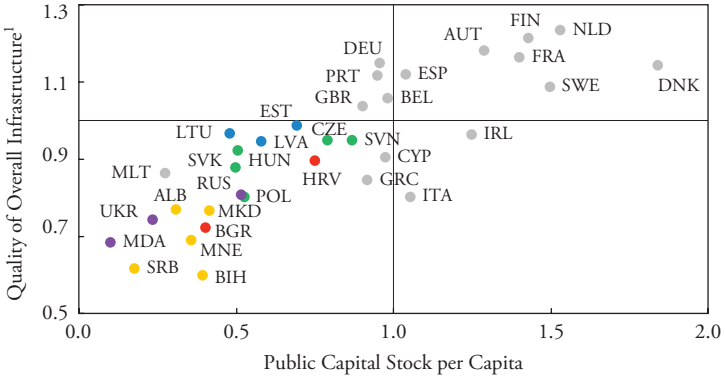
In addition, the overall quality of infrastructure remains poor. Despite progress made in increasing the capital stock, the quality of infrastructure has remained well below that in the EU, including the new EU member states (Figure 2.2). Surveys suggest that the quality is particularly weak for rail-

[1]It is important to recognize that the public capital stock is not identical to infrastructure (on a reasonable definition of infrastructure). For example, financial estimates of capital stocks in the public sector include values of residential dwellings, health institutions, and government offices. Also, some government assets (especially roads) are difficult to value, both within the country and across countries. These shortcomings argue in favor of supplementing financial estimates by quantitative measures of infrastructure expressed in per capita terms.

[2]See https://ec.europa.eu/neighbourhood-enlargement/countries/check-current-status_en.

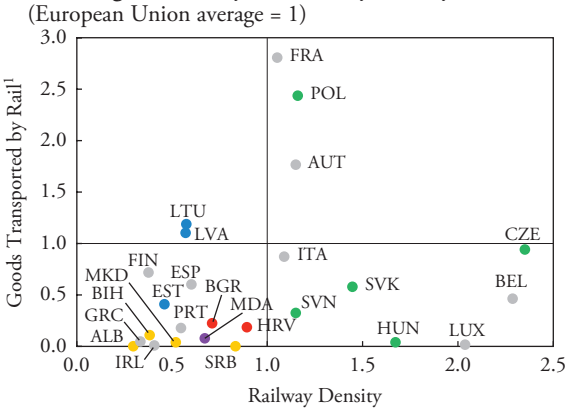
Figure 2.2. Public Infrastructure: Quantity versus Quality

1. Quality of Overall Infrastructure and Public Capital Stock, 2015
(European Union average = 1)

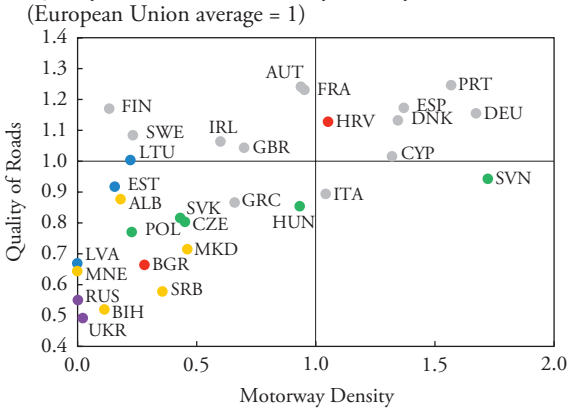


Sources: WDI database; IMF, FAD database; and IMF staff calculations.
[1]WEF measures the quality based on surveys. Kosovo is not covered by the survey.

2. Rail Freight Efficiency and Railway Density, 2015
(European Union average = 1)



3. Quality of Road and Motorway Density, 2015
(European Union average = 1)



Sources: International Road Federation; WDI database; and IMF staff calculations.
[1]Goods transported by railway are the volume of goods transported by railway, measured in metric tons times kilometers traveled.

roads and railways, where the legacy of severe underinvestment, inadequate maintenance, and weak project selection and implementation frameworks is more tangible. In the energy sector, the gap is more uneven. Albania, Kosovo, Montenegro, and FYR Macedonia suffer from an unstable energy supply and frequent outages, coupled with large distributional losses, due to obsolete and low-capacity power plants.[3] The situation is less critical in Bosnia and Herzegovina and Serbia, where electricity supply is largely secured.

[3]In 2016, the average duration of interruptions (about 97 hours in Albania, 62 hours in Kosovo, 27 hours in Montenegro, and 5.6 hours in FYR Macedonia) and the average number of interruptions per customer per year (about 43 times in Albania, 35 times in Kosovo, 20 times in Montenegro, and 13 times in FYR Macedonia) were well above the EU-NMS averages (about two hours and one time, respectively). Similarly, the average losses for distribution in Albania, FYR Macedonia, Montenegro, and Serbia were significantly higher than in their EU New Member States (EU–NMS) peers.

Box 2.1. Western Balkans—Regional Initiatives

Following the 1990s regional conflicts, the international community established in 1999 the Stability Pact for the Balkans, which was a comprehensive and long-term conflict prevention strategy. The Stability Pact was the result of an extraordinary international effort aimed at building a unified approach to the whole region. It received support from a wide coalition of international financial institutions, donor governments, and international organizations, including the EU, Council of Europe, and Organization for Economic Co-operation and Development (OECD). After more than 15 years, the established system of regional cooperation in the Balkans has been considered successful, particularly in the areas of transport and energy as well as in specific fields of socioeconomic policies. Nevertheless, the Stability Pact's plans have not been implemented as speedily as expected. Implementation delays may partly reflect the fact that the internationally led approach limited the recipient countries' ownership, plus the EU's complex governance.

The Stability Pact was replaced by the Regional Co-operation Council in 2008, responding to the need for a more regionally owned and more streamlined framework. Separately, the introduction of the EU Instrument for Pre-Accession Assistance (IPA) contributed to increasing absorption of EU assistance by consolidating efforts into a sole support instrument and simplifying the overall process.

In parallel, the Western Balkans Infrastructure Framework (WBIF) was established to improve donor coordination and accelerate the implementation of connectivity projects. Despite challenges, the WBIF has accelerated the preparation and execution of priority investments in line with regional and national strategies by leveraging loans and grants (blending mechanism) and providing priority to projects with regional impact. Eligible projects are identified and proposed by country beneficiaries through their National Investment Committee and Single Project Pipeline.

The Berlin Process is the latest regional cooperation initiative. In 2014, the Berlin Process was launched to consolidate and keep alive the integration policy dialogue in the region, despite the recognition that there would be no further EU enlargement in the near term.[1] By bringing together all six Western Balkan countries and EU member states supporting the enlargement toward the Western Balkans, the key message of the Berlin Process is that the EU accession prospects and integration will continue despite the current temporary pause. The overall process is largely focused on implementing regional infrastructure projects, but also other aspects of integration, including youth

[1]The Declaration of the European Commission President Jean-Claude Juncker stated that there would be no EU enlargement over the next five years (European Commission 2014). However, in his State of the Union Address in September 2017, Juncker confirmed the importance of enlargement to the Western Balkan countries in a longer-term perspective.

Box 2.1 *(continued)*

and political cooperation as emphasized by various summits (largely Vienna and Paris).[2] In the July 2017 Trieste summit, the EU Commission pledged an additional €190 million for connectivity projects. Moreover, an action plan for establishing a regional economic area was also adopted.

The Berlin Process calls for accelerating implementation of priority connectivity projects in the energy and transportation sectors. Connectivity involves not only building new infrastructure, but also getting the best use of it. Donor and recipient countries agreed on 10 priority projects (six transportation and four energy projects) to be implemented by 2020 (EU grants and loans from international financial institutions amount to €1.4 billion). However, the progress achieved so far has been limited. Work on the ground is expected to start soon for a few of these projects, while the other ones are still in an early preparation stage.

Greater efforts are needed at both regional and national levels for advancing the implementation of priority projects. Given capacity constraints, recipient countries could delegate more to supranational entities, including the WBIF and international financial institutions, for the preparation and execution of regional projects. Timely progress in implementing these regional projects not only will raise the potential growth of the Western Balkan economies, but also will cement public consensus for greater regional cooperation as well as political stability to bring the EU integration process forward.

[2]Summits were held in Berlin (2014), Vienna (2015), Paris (2016), and Trieste (2017).

CHAPTER

3 Quantifying the Region's Infrastructure Gaps

Stylized Facts

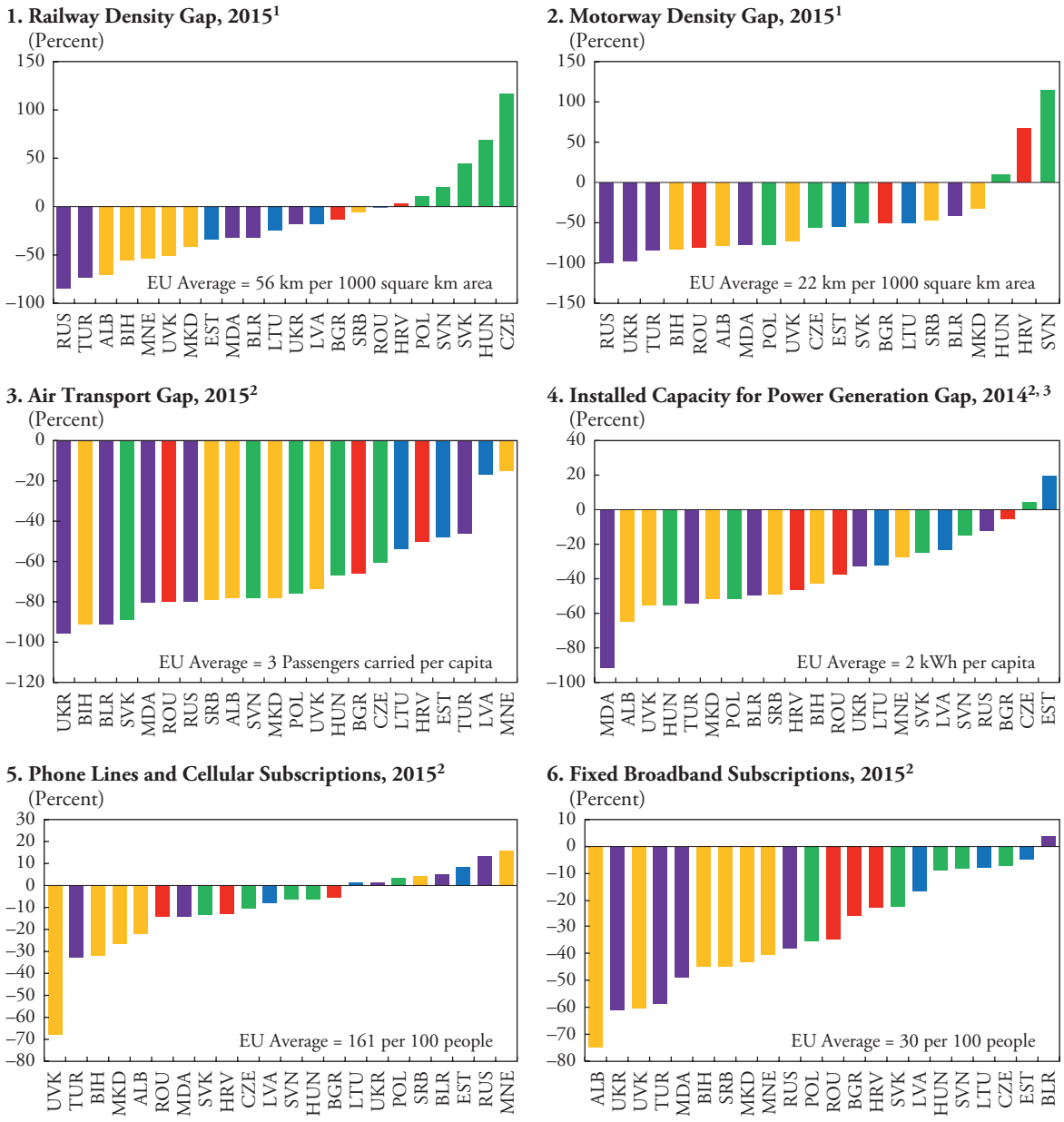
Six indicators of infrastructure development are used to form a representative view on the pressing infrastructure bottlenecks:[1]

- Three indicators of **transport infrastructure**: motorway density and railway density (both in kilometers per 1,000 square kilometers adjusted for population density) and a measure of airport capacity and utilization (in number of passengers per capita)
- One indicator of installed **capacity for power generation** (in kilowatt per capita)
- Two indicators on **telecommunication networks**: number of phones (landline and cellular) and fixed broadband subscriptions (both per 100 people)

These quantitative indicators point to large gaps in infrastructure (Figure 3.1). Compared with the EU average, Western Balkan countries exhibit low railway and motorway densities and weak airport capacity and utilization. Installed capacity for power generation—an important indicator of a country's investment attractiveness as assessed by foreign investors—is also very weak. Similarly, broadband internet connections are scarce, while phone connectivity appears to be less of a problem.

[1]These public infrastructure components are far from being exhaustive. Ports, local roads, and water supply and treatment infrastructure, as well as health, education, and research and development infrastructure are all very important. However, it is difficult to design a consistent cross-country comparison along these dimensions (for example, a landlocked country would not need ports, and research and development capacity is difficult to compare across countries). Also, it is important to recognize that these indicators do not capture a few important issues, including varying quality of existing infrastructure, energy efficiency of national economies, or public demand for infrastructure services. Despite these issues, the gaps presented here are likely to be representative of the overall stage of public infrastructure development.

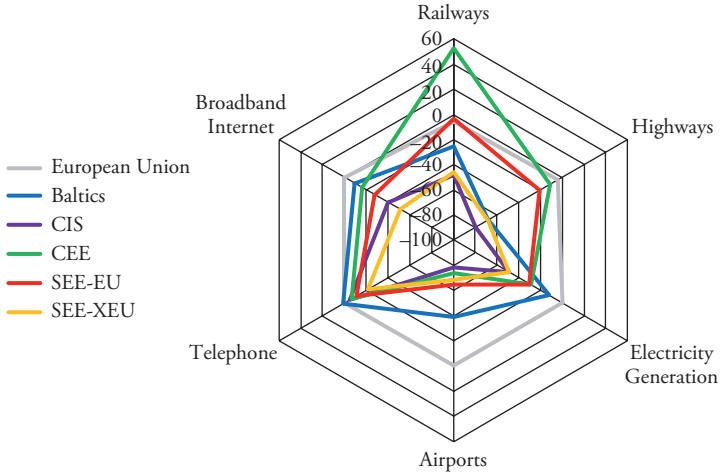
Figure 3.1. Public Infrastructure Gaps



Sources: WDI database; International Road Federation; Eurostat; EIA; and IMF staff calculations.
[1]Gaps are computed vis–à–vis EU average adjusted for population density. EU = European Union.
[2]Gaps are computed vis–à–vis EU average.
[3]Latest available data for installed capacity for power generation are for 2014.

Figure 3.2. Public Infrastructure Gaps by Sector and Region

Regional Peers: Infrastructure Gaps, 2015
(Percent)



Sources: WDI database; EIA; IRF; Eurostat; and IMF staff calculations.
Note: Electricity generation data are for 2014. CEE = Central Eastern Europe; CIS = Commonwealth of Independent States; SEE-EU = Southeast Europe EU members; SEE-XEU = Southeast Europe non-EU members.

Public infrastructure in Western Balkan countries falls significantly short relative not only to infrastructure in the EU but also to that in more dynamic regional peers. Infrastructure development in the region (SEE-XEU) seems to be broadly at par with infrastructure in CIS countries. But it falls significantly short of development in CEE, SEE-EU, and Baltic countries (Figure 3.2). For example, the length of railways in CEE countries (relative to their area and population) is about 50 percent longer than the average EU level, compared with 40 percent shorter in Western Balkan countries. Similarly, indicators of highway densities in CEE countries are at par with those in the EU, while those in the Western Balkan countries fall 60 percent short.

Aggregating the Individual Gaps into a Single Coherent Index

Given that bottlenecks across different sectors vary significantly across different countries in the region, there is value in aggregating a single, coherent, and comparable index. To formally assess the overall infrastructure gap, an aggregate infrastructure gap index is constructed for each country (i) and year (t) as a sector-based weighted sum of the individual infrastructure indicators (j) discussed in the previous sub-section and expressed in percentage point deviations from the average EU level:[2]

[2]See Annex I for details.

$$Infrastructure\ Gap_{i,t} = \sum_{j} w_j \left[\left(\frac{Indicator^{j}_{i,t}}{Indicator^{j}_{EU,t}} - 1 \right) \times 100 \right]$$

Individual infrastructure indicators are weighted by the inverse of standard deviation of each gap, implying that smaller weights are assigned to indicators with higher variability across countries and time.[3]

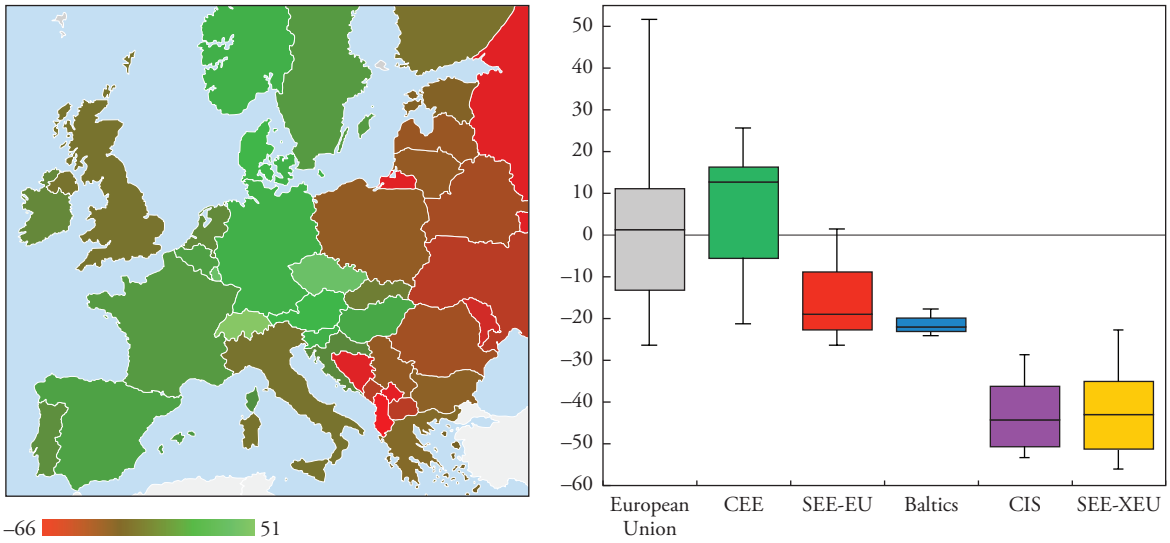
Not surprisingly, the aggregate index confirms the region's large gaps. The aggregated index of individual components of public infrastructure highlights two important insights (Figure 3.3). First, the aggregate index of infrastructure suggests that the average infrastructure development in the Western Balkan region is about 50 percent lower than the EU average, ranging from about 30 percent lower in Serbia to nearly 70 percent lower in Albania. This likely limits deeper regional integration, prevents Western Balkan countries from reaping benefits of economies of scale, and reduces their attractiveness as a destination for foreign direct investment (FDI) inflows. Second, Western Balkan countries are far from emulating the infrastructure development of more dynamic regional peers that managed to exploit their integration into European supply chains. Indeed, some CEE countries have infrastructures that—at least based on the quantitative indicators considered here—are comparable with those in advanced economies such as Germany, France, and Spain. But SEE-EU and Baltic countries also appear to have significantly more extensive infrastructure than Western Balkan countries, which have an average gap similar to that of the CIS group.

The current pace of investment in public infrastructure is unlikely to be sufficient to quickly bridge the gap. Over the past decade and a half, Western Balkan countries have recorded annual public investment rates averaging over 6 percent of GDP, ranging from 3 percent of GDP in Serbia to over 8 percent of GDP in Bosnia and Herzegovina and Kosovo. This is significantly higher than public investment rates in other Central, Eastern, and Southeastern European (CESEE) countries (3–5 percent of GDP) or EU countries (about 3½ percent of GDP). During this period, Western Balkan countries more than doubled their per capita capital stocks on average. Given low stock levels, however, it would take about 33 years to catch up with the current EU level of capital stock per capita even at these high investment rates (Figure 3.4).

[3]The intuition behind this weighting scheme is that infrastructure indicators are a combination of noise and "true" information components capturing the behavior of the underlying infrastructure. Indicators with high volatility are likely to have higher noise components, and thus less confidence should be placed on them, justifying lower weights. Applying alternative weighting schemes (for example, equal weighting) produces qualitatively similar results and has no significant implications for the empirical findings presented later in the paper.

Figure 3.3. Europe: Aggregate Infrastructure Gap Index, 2015[1]

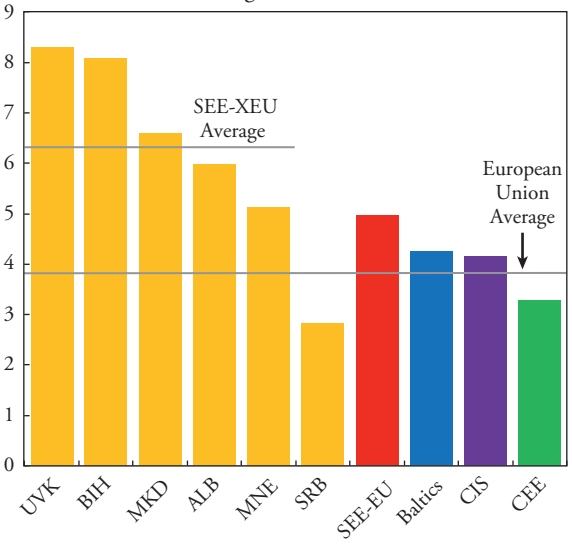
Infrastructure Gap Index, 2015[1,2]



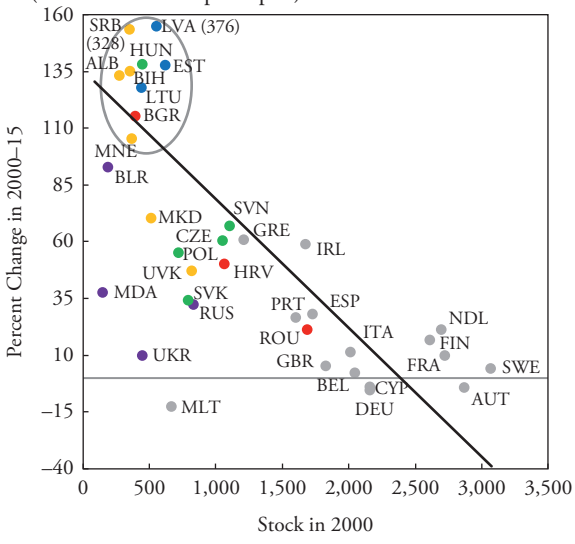
Sources: WDI database; EIA; IRF; Eurostat; and IMF staff calculations.
[1]Infrastructure Gap Index is the weighted sum of railway density, motorway density, installed capacity for power generation, phone lines and cellular subscriptions, air transport passengers, and internet subscriptions. Installed capacity for power generation data are available for 2014 only. CEE = Central Eastern Europe; CIS = Commonwealth of Independent States; SEE-EU = Southeast Europe EU members; SEE-XEU = Southeast Europe non-EU members.
[2]The right panel shows the minimum, first quartile, median, third quartile, and maximum of the data.

Figure 3.4. Public Investment Rates and Capital Stocks

1. Public Investment
(Percent of GDP, average 2000–15)

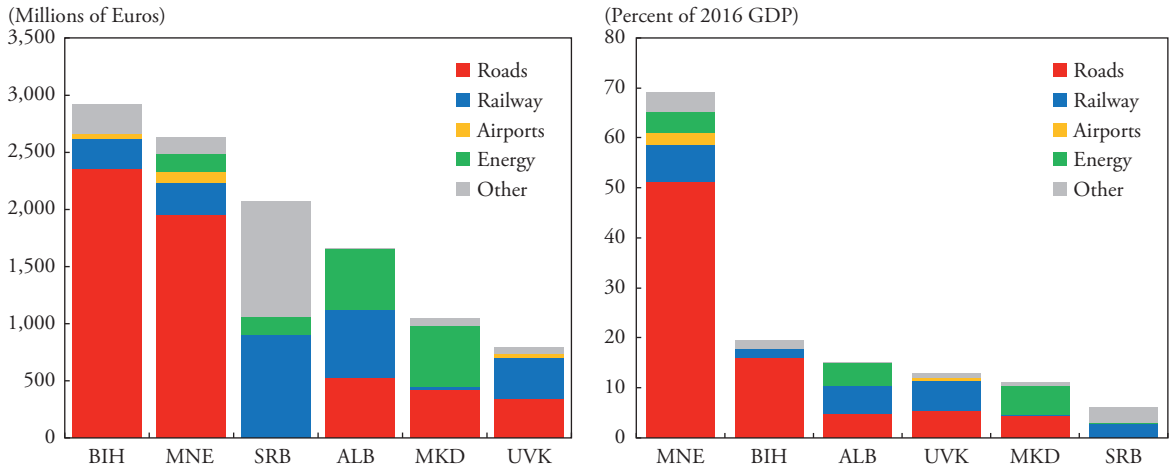


2. Public Capital Stock
(PPP 2011 dollars per capita)



Sources: IMF, FAD Database; and IMF staff calculations.
Note: CEE = Central Eastern Europe; CIS = Commonwealth of Independent States; SEE-EU = Southeast Europe EU members; SEE-XEU = Southeast Europe non-EU members.

Figure 3.5. Top 15 Projects in National Single Project Pipelines[1]



Sources: National authorities; IMF, WEO; and IMF staff calculations.
[1]Includes top 15 projects for each country.

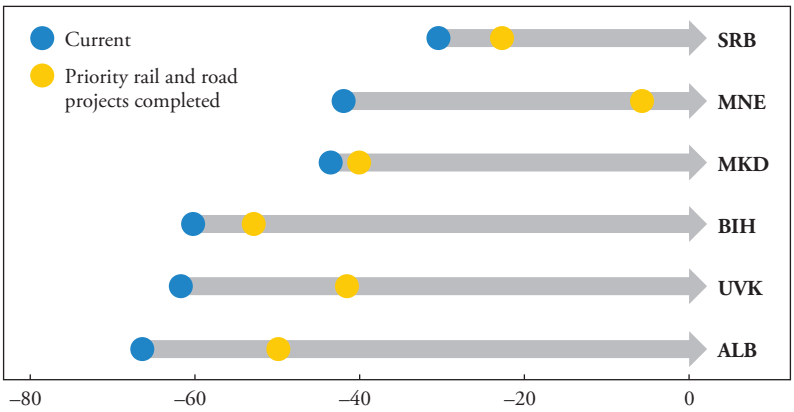
National Investment Priorities

National investment priorities recognize the critical importance of addressing large infrastructure bottlenecks. In all Western Balkan countries, Single Project Pipelines have been established—in coordination with the relevant EU institutions—to identify priorities and seek financing for projects aimed at addressing the existing infrastructure gaps. The scale and focus of national project pipelines vary significantly but the focus on improving transport infrastructure (especially roads and railways) and upgrading energy generation capacity is prominent in the entire region (Figure 3.5). The overall cost of the top priority projects varies substantially across countries, from about 7 percent of GDP in Serbia to 20 percent of GDP in Bosnia and Herzegovina. Montenegro, with its pipeline of 70 percent of GDP worth of projects, is a clear outlier, as the country's project pipeline includes projects (mainly roads) that are unlikely to be economically viable or fiscally sustainable.

Implementation of these priority projects would reduce infrastructure gaps (Figure 3.6). Back-of-the-envelope calculations suggest that full completion of these railway and road projects alone would close on average about a fifth (or about 10 percentage points) of the current infrastructure gaps of countries in the region. Montenegro is an exception; most of the estimated gap would be bridged if the projects were completed, but that would come at a prohibitively high cost to the country's debt sustainability. Some of the Montenegro projects are also of questionable economic relevance/viability (low strategic

Figure 3.6. Estimated Impact of Implementing Priority Projects

Impact of Priority Projects[1]
(Infrastructure Gap Index, EU-28 = 0)



Sources: WDI database; EIA; IRF; Eurostat; and IMF staff calculations.
[1]Assumes BIH average costs of building one killometer of rail and road infrastructure for all countries. EU = European Union.

grid scores).[4] Separate from roads and railways, completion of envisaged projects in energy, airports, and waste management would help further reduce the region's infrastructure gaps, although these gaps are more difficult to quantify. All in all, even assuming full implementation of the current priority projects the residual gaps in public infrastructure are likely to remain significant.

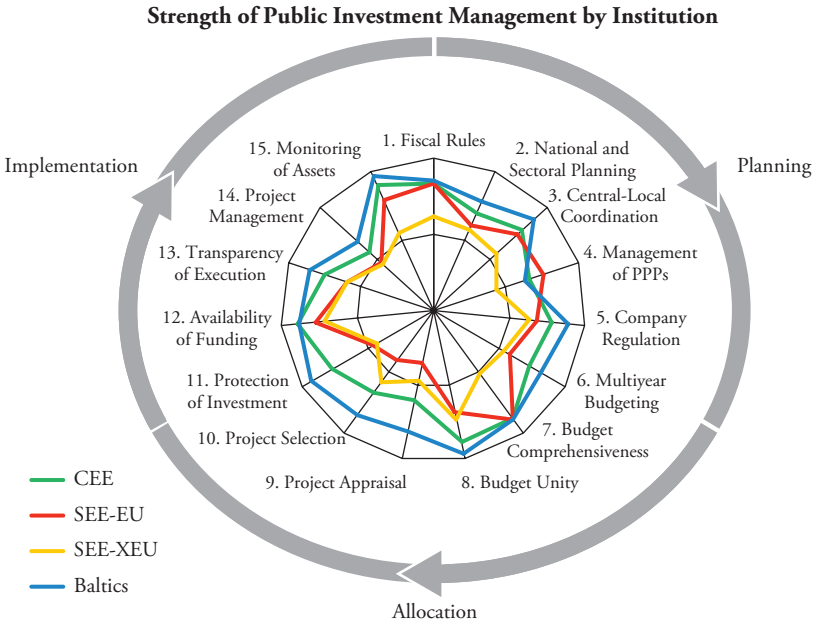
Public Investment Management and Regulatory Frameworks

Public investment management frameworks in the region exhibit significant weaknesses. For Western Balkan countries, Public Investment Management Assessments (PIMAs) recently carried out by the IMF point to significant institutional weaknesses of public investment management practices (Figure 3.7).[5] Findings of the PIMA reports indicated that there is considerable

[4]These calculations should be interpreted with care, as unit costs of building infrastructure (kilometers of roads/rails financed by €1 million)—estimated from the 2016 Framework Transportation Strategy of Bosnia and Herzegovina—vary significantly across projects. Geological conditions and quality of projects are key determinants of the dispersion in the unit costs. The marginal economic contribution of a euro invested in the different sectors may differ from the marginal contribution to the measured index used in this analysis.

[5]The PIMA assesses the strength ("on paper") and the effectiveness ("in practice") of the institutions. Specifically, the PIMA evaluates 15 key institutions for planning, allocating, and implementing public investment. For each of the 15 institutions, three key features are identified, each of which can be fully met, partly met, or not met. Based on how many of these key features are in place, countries are given a score. PIMA scores for Albania, Kosovo, and Serbia are based on Fiscal Affairs Department technical assistance reports, while scores for the other three Western Balkan countries are based on desk reviews conducted as part of the preparation of the IMF's November 2016 *Regional Economic Issues Report*.

Figure 3.7. Public Investment Management Assessment



Sources: FAD PIMA database; and IMF EUR REI, November 2016.
Note: CEE = Central Eastern Europe; SEE-EU = Southeast Europe EU members; SEE-XEU = Southeast Europe non-EU members.

room for improvement in the efficiency and productivity of public investment in all Western Balkan countries (Boxes 3.1 and 3.2)—in this paper, "efficiency" refers to the share of wasted resources during the construction phase, and "productivity" refers to the positive spillovers of the infrastructure project into the private sector. On average, the strength of public investment management in the Western Balkans is only about 70 percent of that in their more efficient Baltic and CEE peers. This low efficiency of public spending does not necessarily imply that increases in public investment spending in the region would have a lower impact on growth than in more efficient countries (see Berg and others 2015). Instead, it implies that "investing in investing" through structural reforms that increase efficiency would have a direct and potentially powerful reinforcing effect on growth, particularly considering that the marginal product of public capital is likely to be high in the Western Balkans due to the region's low capital-output ratios.

Public infrastructure investment is often subject to political economy motives, rather than economic efficiency considerations. International experience shows that weak operational frameworks increase the likelihood of political interference and make the expropriation of sunk investments more likely, jeopardizing the realization of medium-term returns (see Guasch, Laffont, and Straub 2007). Indeed, anecdotal evidence from the region suggests that

the politicization of infrastructure investments in Western Balkan countries is common due to interest group pressures and the complex structure of political institutions affects investments by state-owned enterprises. In this context, national infrastructure projects are often revised in scope, priority, and financing following changes in the government composition and representation. Similarly, many observers use the proliferation of Chinese investments in the region as an illustration that a strategic political motivation is often to be found behind investments in energy and transportation infrastructure (see Lagazzi and Vít 2017).

Weak and unstable regulatory frameworks further undermine private investment in infrastructure. In several countries, lack of frameworks ensuring the sustainability of regulated prices has deterred private sector involvement. Specifically, slow adjustments of regulated prices of electricity or road tolls—hampered by electoral promises and prone to political interference—have discouraged domestic and FDI activities.

Box 3.1. 2016 Public Investment Management Assessment—Key Findings

The findings of the Public Investment Management Assessment reports indicate that there is considerable room for improvement in the efficiency and productivity of public investment in all Western Balkan countries.[1] The following are key findings:

1. Institutional frameworks are fragmented with overlapping mandates and little coordination of various public bodies.
2. Project selection criteria are not systematically applied and are often waived.
3. Project pipelines, primarily used for Western Balkans Infrastructure Framework–funded projects, are often outside the medium-term budget program, allowing a proliferation of other projects, which instead are included in the budget but are not ready for implementation.
4. There is limited coordination between central government and municipalities, leading to a distorted allocation of capital spending.
5. Public procurement laws, including on e-procurement, are well designed for competitive and transparent procedures, but implementation and compliance are weak and infrequent.
6. Monitoring and disclosure of financial performance, investment plans, and fiscal risks of state-owned enterprises are limited or inexistent.
7. There are substantial gaps in government budgets, largely due to state-owned enterprises' capital spending, which is not included.
8. Ex post assessments and audits of projects are not generally undertaken by the government—only infrequently in the cases of donor-funded projects.

[1]Public Investment Management Assessment (PIMA) reports were prepared for Albania (June 2016), Kosovo (April 2016 and June 2017), and Serbia (April 2016).

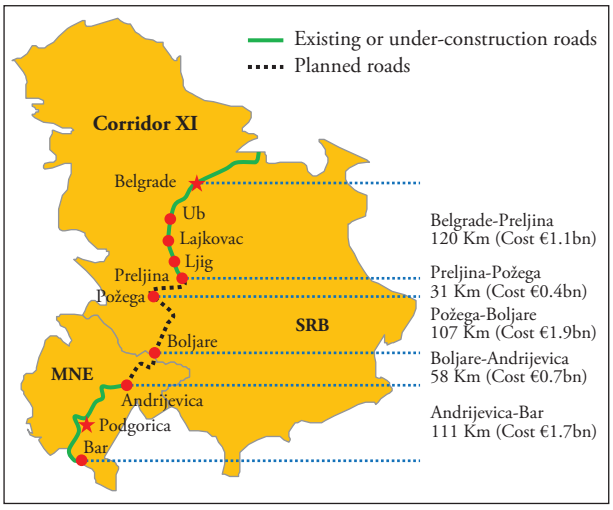
Box 3.2. Evidence from Large Infrastructure Projects

Montenegro: Highway Project[1]

The Bar-Boljare Highway is a three-phase project to connect Montenegro's main southern seaport to Serbia's road network. The key motivation for this large project is the need to improve regional connectivity. The highway is part of Montenegro's plans to integrate the Montenegrin transport network with those of neighboring countries to boost tourism and trade, improve road safety, and strengthen national security (Figure 3.8). The project was undertaken against the advice of international financial institutions, which projected economic returns to be low.

Montenegro's public debt risks are becoming unsustainable. The first phase of the project—which is the only one budgeted, contracted, and currently under implementation—will cost about a quarter of GDP, crowding out other essential capital spending and posing major fiscal sustainability risks. In the absence of any fiscal adjustment, public debt would have increased to over 90 percent of GDP by 2019. Avoiding this has required a substantial fiscal adjustment to restore debt sustainability over the medium term. However, given the large additional cost of the two remaining phases, estimated at about €1.2 billion, their implementation could be considered only if the authorities are able to secure mostly concessional financing for the project. The estimated low economic return on the investment, due to a higher-than-projected cost

Figure 3.8. Corridor XI



	Section	Length (Km)	Cost (€ mil.)	Contractor (country)
SRB	Surčin-obrenavoc	18	209	China
	Obrenovac-Ub	26	338	China
	Ub-Lajkovac	13	…	Serbia
	Lajkovac-Ljig	24	…	China
	Ljig-Preljina	40	308	Azerbaijan
	Peljina-Požega	31	370	…
	Požega-Boljare	107	1,900	…
MNE	Boljare-Andrijevica	58	731	…
	Andrijevica-Manteševo	21	295	…
	Manteševo-Smokovac	41	810	China
	Smokovac-Farmaci	18	233	…
	Farmaci-Durmani	31	404	…
Total			6,000	

[1]The project was given to a Chinese contractor without competitive bidding, but the China ExIm bank is providing financing with a concessionality element of over 20 percent.

Box 3.2 ***(continued)***

per kilometer (because of geological challenges) and the lower expected traffic, calls for concessional financing to ensure the financial viability of the project. Separately, the economic return of the project would improve if Serbia builds the connecting road. But plans to complete the Požega-Boljare stretch are far from certain due to high costs.

Cost overruns are significant due to the realization of currency risks. The cost of the first phase has increased significantly as the dollar loan contract was not hedged against the foreign exchange rate risk, which led to a 25 percent increase in costs (€1 billion versus €809 million) fully borne by the government.

Kosovo: Highway Kosovo-Albania

The construction of Route 7, linking the capital, Pristina, with the Albanian border through a four-lane motorway, was the largest infrastructure project completed after Kosovo's independence. In the period 2010–13, the government's capital budget was almost entirely devoted to financing this large highway, with a total cost of the motorway of close to 20 percent of GDP. So far, it has been the most expensive public project in Kosovo and the quality of the motorway matches international standards. However, the project was overly ambitious compared with the actual and potential needs (less than one-third of capacity has been used so far), including the still limited trade flows with Albania.

The project was of high political importance for Kosovo. It was largely justified by the strong cultural linkages with Albania and the importance of having access to a seaport for a landlocked country. Medium-term capacity needs, economic impact, or gains in road safety received less attention. A less expensive and ambitious option would have left substantial resources to modernize other roads in poor condition, particularly rural ones, which are used for local commuters. Ensuring greater competition in submitting bids, conducting transparent procurement procedures, and more robust monitoring and auditing would also have helped achieve a better allocation of public resources and prevent substantial cost increases (Rajaram and others 2014).

CHAPTER

4 Fiscal Space and Sustainability

Fiscal Sustainability Constraints

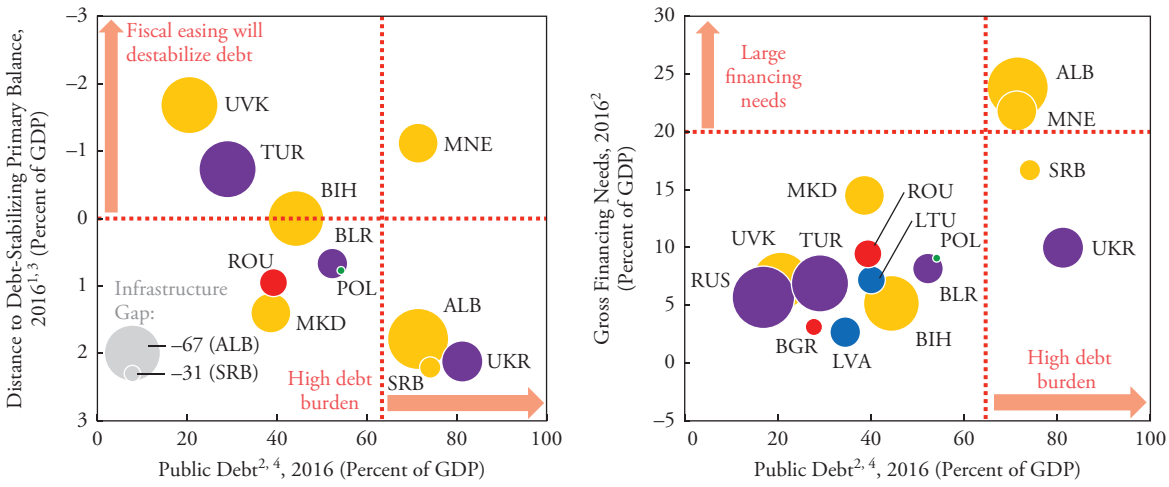
Closing the infrastructure gap will be challenging for most countries in the region due to limited fiscal space. Filling large infrastructure gaps requires substantial fiscal resources, either from budgetary revenue or through debt financing. However, most countries in the region have already-high levels of public debt (55 percent of GDP on average in 2016), with three countries above 70 percent of GDP. Indeed, deficit levels in 2016 were already higher than the debt-stabilizing primary balance in Montenegro and Kosovo, and right on the edge in Bosnia and Herzegovina (Figure 4.1).[1]

High debt has an adverse impact on the economy through several channels. It puts a drag on economic growth, deteriorates fiscal performance, and raises risk premiums. Above the maximum appropriate level, public debt gets destabilized and the country faces the risk of losing market access. While safe debt levels depend on country-specific circumstances, for emerging market countries the IMF uses a "norm" or threshold of 65 percent of GDP for total public debt as an economic vulnerability indicator. This threshold is a good proxy for a sustainable debt level. Albania, Serbia, and Montenegro are already above this debt level. In Bosnia and Herzegovina and FYR Macedonia, total public debt is in the range of 35–50 percent of GDP, but increasing at a steady pace, while in Kosovo it was still about 20 percent of GDP in 2016.

Liquidity constraints are also likely to be binding. Gross financing needs describe the financing that a country must raise in the short term to cover its deficit and the part of public debt that is due in the next year. If gross financing needs are high, the country might be facing liquidity problems. In

[1]In Kosovo, this owes to the fact that the debt level is low so the debt-stabilizing primary balance is commensurately high. At current deficits, debt is still expected to stabilize at about 30–35 percent of GDP.

Figure 4.1. Fiscal Space and Infrastructure Gaps



Sources: IMF, DSA; IMF, VEE; WDI database; EIA; IRF; Eurostat; and IMF staff calculations.
Note: Size of bubbles is proportional to the extent of infrastructure gap.
[1]Computed as a difference between actual (cyclically adjusted) and debt-stabilizing primary balances.
[2]Public debt and gross financing needs thresholds used in the IMF economic vulnerability indicators are 65 percent of GDP and 20 percent of GDP, respectively.
[3]Debt-stabilizing primary balances is published data taken from the respective country's staff report.
[4]Public debt are gross general government debt.

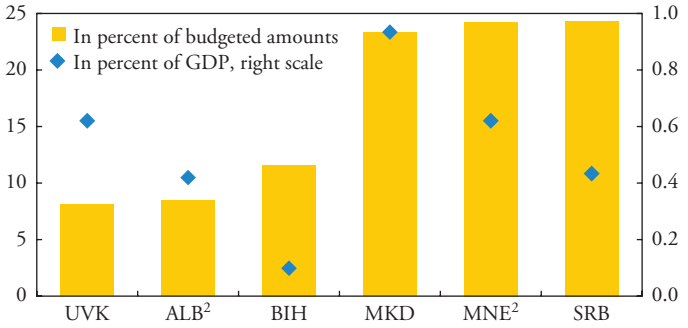
Albania and Montenegro, the gross financing needs in 2016 were above the 20 percent of GDP threshold used by the IMF as a liquidity and solvency vulnerability indicator. FYR Macedonia and Serbia also face gross financing needs close to the 15 percent level, while Kosovo's, despite that country's low public debt, are close to 10 percent of GDP largely due to the very short-term maturity of the outstanding debt.

Several Western Balkan countries are in the "risky zone" when looking at all fiscal sustainability indicators. Montenegro is above all three sustainability thresholds, while also having a substantial infrastructure gap. Albania has large gross financing needs and a high level of public debt, while Serbia is also above or close to the limit in these two dimensions. These countries will have difficulties financing additional infrastructure projects without fiscal adjustment.

Efficiency of Government Spending and Revenues

While overall fiscal space is limited in some of the Western Balkan countries, even the existing space is not efficiently used. There is a significant underexecution of budgeted capital expenditures in nearly all countries in the region, ranging from about 5 percent to 25 percent (or about 0.1–1.0 percent of GDP) of the budgeted capital expenditure at the central government level (Figure 4.2). Although a consistent comparison across countries is difficult due to differences

Figure 4.2. Capital Budget Underexecution, 2015–16[1]
(Percent)



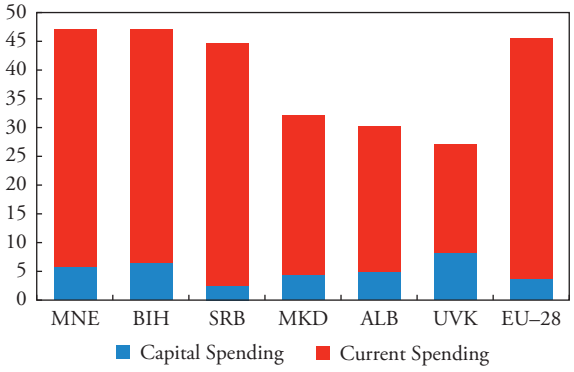
Source: IMF staff estimates.
[1]Coverage refers to the central government level.
[2]Averages for Albania and Montenegro are computed over 2013–15 and 2013–16, respectively.

in the scope of coverage and data availability, the national authorities report that these underexecution rates are even higher at the general government level, especially if all infrastructure funds and public utilities are included. Strengthening project implementation capacity would help better utilize available fiscal space and improve absorption of available donor financing.

There is also scope to accommodate greater capital spending through expenditure rationalization and better revenue mobilization. The efficiency of government spending is low. The overall size of government is large (above 40 percent of GDP) in several countries in the region, notably Montenegro,

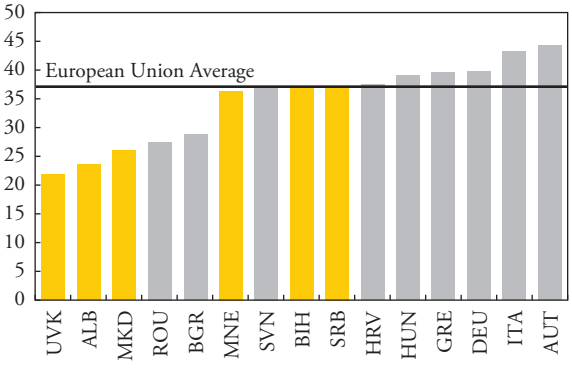
Figure 4.3. Structure of Budgetary Spending and Tax Burden

1. Current and Capital Spending, 2013–15
(Percent of GDP)



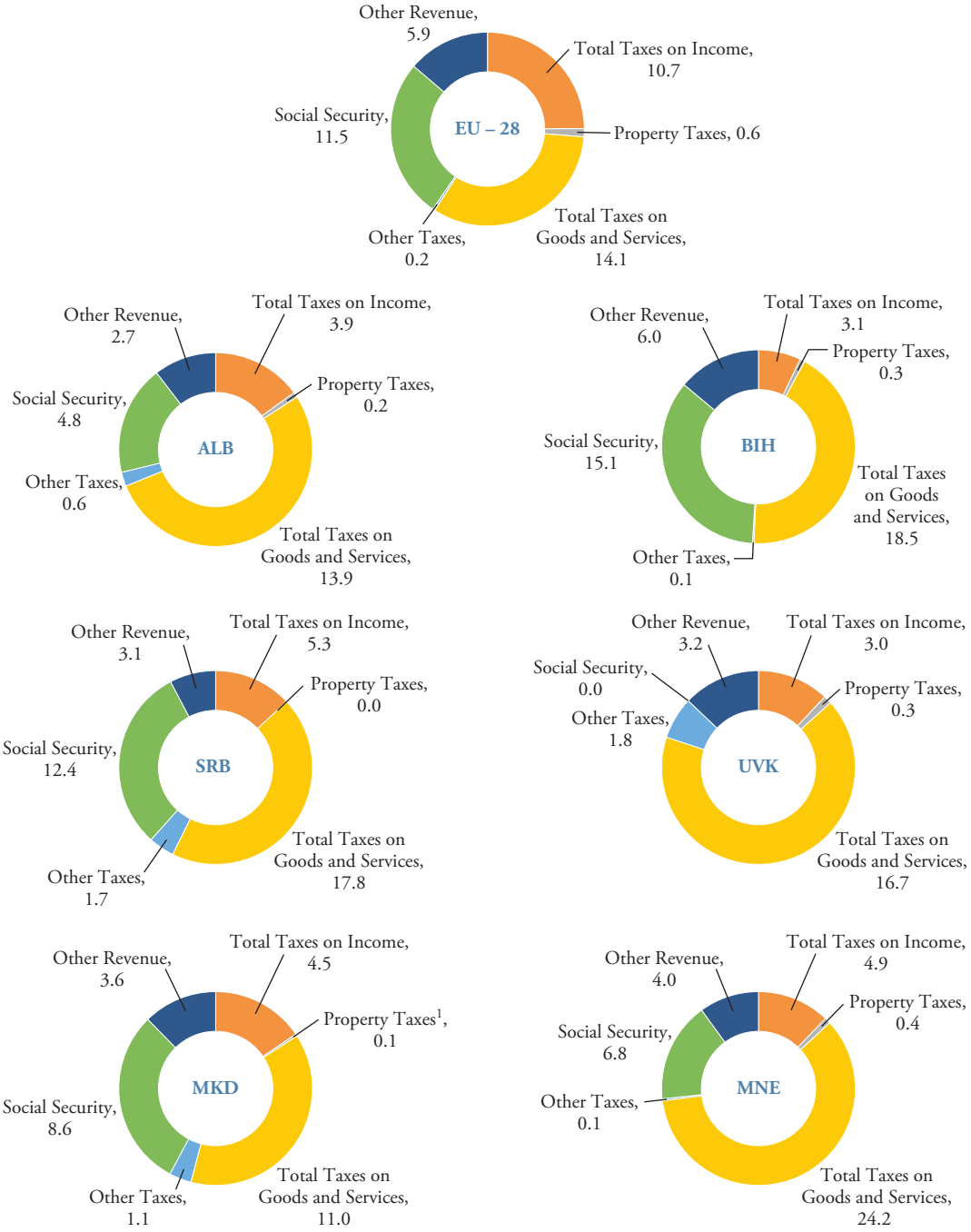
Sources: IMF, FAD Database; IMF, WEO, and IMF staff calculations.

2. Total Revenue from Tax and Social Security Contributions, 2015
(Percent of GDP)



Sources: Eurostat; IMF, WEO; IMF, GFS; OECD; and IMF staff calculations.

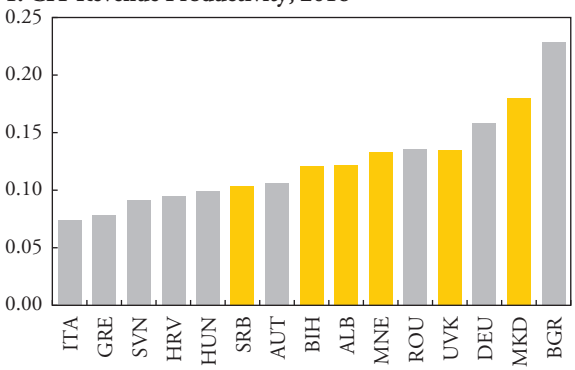
Figure 4.4. Structure of Total Revenues (Percent of GDP), 2015



Sources: Eurostat; IMF, WEO; IMF, GFS; OECD; and IMF staff calculations.
[1]Estimated.

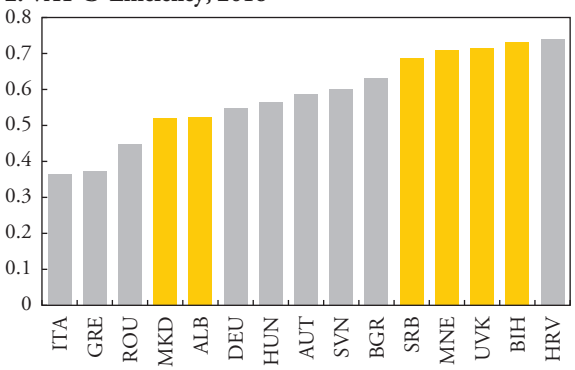
Figure 4.5. Tax Efficiency

1. CIT Revenue Productivity, 2016[1, 2]



Sources: IMF, WEO; IMF, GFS; IMF, FADTP Rates Database; and IMF staff calculations.
[1]CIT Productivity = (CIT Revenue as percent of GDP) / (CIT Rate).
[2]2016 or latest available.

2. VAT C–Efficiency, 2016[1, 2]



Sources: IMF, WEO; IMF, GFS; IMF, FADTP Rates Database; and IMF staff calculations.
[1]VAT C-Efficiency = VAT Revenue / (Total Final Consumption net of VAT Revenue * VAT Rate).
[2]2016 or latest available.

Bosnia and Herzegovina, and Serbia (Figure 4.3), but spending mostly comprises recurrent expenditures rather than investment.

The level and efficiency of tax revenues are typically below those of more advanced European countries. Most countries provide extensive tax exemptions and incentives. The share of property tax revenues—an important source of revenues in advanced economies—is also low in the region (Figure 4.4). Most Western Balkan countries have significant energy subsidies (mostly for coal externalities), which suggests that there is room for revenue increases through energy taxation. The efficiency of tax collection is also low in some of the countries, such as Serbia, Bosnia and Herzegovina, and Albania for corporate income tax (CIT) and FYR Macedonia and Albania for value added tax (VAT). However, VAT C-efficiency ratio is already relatively good in the rest of the Western Balkan countries (Figure 4.5).

CHAPTER

5 External Financing, Role of Donors, and International Financial Institutions

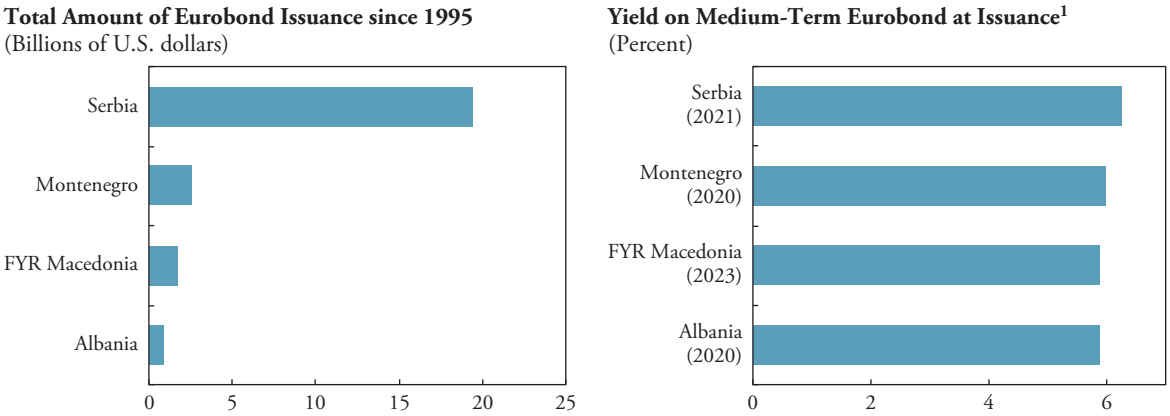
The choice of the most appropriate financing tool is essential for maintaining or restoring debt sustainability. The debt evolution following a capital spending surge will depend on GDP growth and revenue responses to the investment stimulus. This in turn depends on the government's capacity to prioritize productive investments and strengthen capacity absorption.

Domestic funding options are unlikely to be sufficient to scale up infrastructure spending. Mobilizing revenues and containing current expenditures will play an important role in creating necessary budgetary room for higher capital spending, as stressed in the previous section. The overall contribution of domestic savings, however, is unlikely to be sufficient to support a significant scaling-up of the capital budget given the sheer size of infrastructure gaps in the region. These constraints, coupled with an underdeveloped banking system and risks of crowding out private funding, suggest that the burden of financing the infrastructure stimulus may need to be largely borne by external sources.

External borrowing can ease the fiscal and macroeconomic adjustment when the availability of domestic resources is tight. External commercial borrowing can provide the necessary funding for large projects, can free up domestic resources for private investments, and in some circumstances, such as the current favorable global financing conditions, can be less costly than domestic borrowing. At the same time, new external debt also comes with refinancing, interest, and exchange rate risks. Therefore, the use of external financing should be balanced with the risk of building up debt, particularly for countries facing a high risk of debt distress.

Eurobonds are a viable option for tapping external financing. Global low interest rates and investors' search for yields facilitated the successful issuance of Eurobonds in the Western Balkan region. A large portion of Eurobonds

Figure 5.1. Eurobond Issuance in Western Balkans



Source: Bloomberg.
[1]Number in parentheses is the year of the bond maturity.

have been issued by Serbia, FYR Macedonia, and Montenegro, and, to a lesser extent, Albania (Figure 5.1). Interest rates are still moderate, considering the significant fiscal fragility in some countries. However, the current low interest rate environment might change, making it harder for countries to service the debt, particularly for those that are at higher risk of debt distress. Also, more diversified sources of financing may exacerbate vulnerabilities if risks are not carefully hedged and managed. In some cases, limited debt management capacity poses substantial risks, largely due to the challenges in properly handling Eurobond issuance, managing refinancing risks, and ensuring close coordination between fiscal and monetary policies.

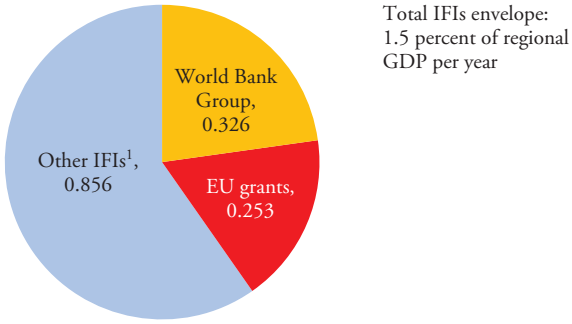
Diaspora bonds could also be helpful for leveraging resources, including remittances, to implement specific projects that benefit the diaspora community or their families (Box 5.1). Nevertheless, diaspora bonds require specific expertise to be properly designed and targeted—an expertise currently lacking in the region. Moreover, experience in other regions shows that these bonds, while a useful alternative, cannot used as a primary source of financing for large projects.

IFI financing would have to provide a significant share of the financing for infrastructure projects. With favorable interest costs, and longer maturity and grace periods, IFI financing is the most suitable tool to support capital projects, without crowding out domestic private investment. Moreover, IFIs can play an important role in facilitating prudent project selection and preparation, streamlining internal processes, and catalyzing the involvement of private capital.

Bilateral financial support can represent an important opportunity, if carefully managed. For example, Chinese financing is usually provided with various degrees of concessionality (Box 5.2), and Azerbaijan, Germany, and

Figure 5.2. International Financial Institutions Financing

Western Balkans: IFIs Annual Envelope (Lending and Grants)
(Percent of regional 2017 GDP)



Sources: EU and IFIs country documents; and IMF staff calculations.
[1]Includes European Investment Bank and European Bank for Reconstruction and Development. IFIs = international financial institutions.

Russia have also financed projects in the region. However, depending on the donor agency, bilateral financing can come with less rigorous project selection requirements, a lower bar for procurement procedures, greater reliance on donor-country contractors for construction and engineering services, and less attention to debt sustainability considerations—all of which can limit the overall impact on the domestic economy. Thus, to make the most of the opportunity for financing large infrastructure projects, it is important to ensure close collaboration between bilateral donors, IFIs, and the government as part of a coordinated public investment program, subject to rigorous project selection, appraisal, and procurement policies.[1]

The Western Balkans Infrastructure Framework will continue to play an important role in catalyzing available resources. The financial institutions and donors involved in the Western Balkans Infrastructure Framework would be able to leverage up to 1.5 percent of the regional GDP per year of external financing in the next five years (Figure 5.2).[2] Even though available amounts might look large, the actual disbursements will depend on each country's progress in strengthening the project cycle, including preparation, selection, monitoring, and execution. However, even assuming speedy progress on all these fronts, these resources will only partially cover the estimated financing needs required to close the existing infrastructure gaps. Additional IFI and donor financing will be needed for funding infrastructure projects in the region.

[1]See Box 2.1 for examples of infrastructure projects in the region that are linked to donor financing.
[2]This financial envelope includes EU grants and assumes IFIs' disbursement in line with the recent past. Estimates based are based European Commission, Instrument for Pre-Accession Assistance (IPA II) 2014–15, for Albania, Bosnia and Herzegovina, Kosovo, FYR Macedonia, Montenegro and Serbia.

Box 5.1. Diaspora Bonds

Diaspora bonds can be useful for tapping into the wealth of the diaspora community to finance infrastructure. Low policy credibility and political instability often hinder developing countries from obtaining the capital required to proceed with vital projects. In this context, the potential for diaspora bonds is significant for many countries with large diasporas abroad. For instance, India and Israel have raised over $11 billion and $35 billion, respectively, by tapping into the wealth of their diaspora communities. These diaspora bonds represented a stable and cheap source of external finance. For diaspora investors, these bonds offered the opportunity to help their country of origin while also providing an investment opportunity.

Designing and managing a diaspora bonds program could be challenging. There are sizable fixed costs in establishing a diaspora bond program, largely for assessing the risk profile, liquidity preferences, and expected return of the diaspora community. Several countries, including Ethiopia and Kenya, have tried but failed to issue diaspora bonds. Issuance in foreign currency or under foreign jurisdiction could help mitigate devaluation and default risks for migrants, who might have a more pronounced risk-averse profile toward devaluation/default risks. International experience suggests that diaspora bond issuance from countries with weak governance and high sovereign risk may require support for institutional capacity building and credit enhancement from multilateral or bilateral agencies (see Ketkar and Ratha 2010). This is not least because in these countries the diaspora members have little faith that the money will be used for the intended purpose.

In the Western Balkans, diaspora bonds could mobilize the wealth of relatively richer migrants who have moved to EU countries, by leveraging the “emotional” ties of the diaspora community. If the proceeds were to directly finance some key basic infrastructure projects—or benefit the diaspora community or their families—the chances of success in issuing diaspora bonds could be high. Importantly, diaspora communities also facilitate significant FDI inflows to the region, given information they have in terms of investment opportunities and ways to ensure compliance with domestic regulation and legislation.

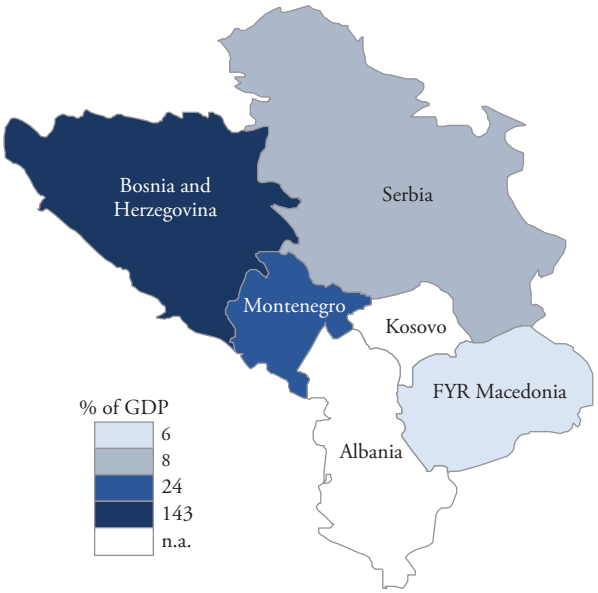
Box 5.2. China's Involvement in the Western Balkans

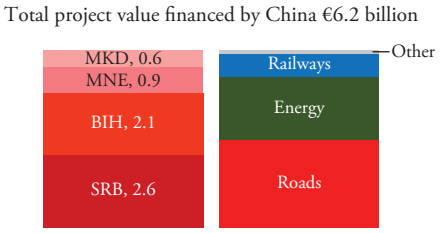
China's economic presence in the Western Balkans is growing and will increase in the coming years. Following the first summit in November 2015 of the Chinese government with Southeastern Europe counterparts, commercial linkages were strengthened, including through a few bilateral agreements. For China, there are investment opportunities in various sectors, including railways, motorways, and power generation. Moreover, the Western Balkan countries' geographical proximity to the EU, coupled with their opportunity to join the EU, represents an important prospect for Chinese economic operators to access the EU single market.

Strengthening trade corridors used by Chinese companies will improve regional connectivity. Improved transportation projects in the region will facilitate the transport of Chinese goods into the EU single market (Figure 5.3). At the same time, this strategy will strengthen regional connectivity infrastructure that supports the deepening of the Western Balkan internal market as well as its linkages with the EU single market.

The overall impact on the domestic economy will depend on how projects are selected and managed. While Chinese projects have tended to come with concessional financing, they have also tended to be treated outside of the normal project selection processes or procurement procedures, and (as in Montenegro) without full attention to debt sustainability considerations. High reliance on Chinese contractors can also limit projects' impact on the home economy during the construction phase.

Figure 5.3. China's Involvement in the Western Balkans





Country	Project
SRB	Danube bridge Belgrade-Budapest high-speed railway 350 MW unit at the Kostolac thermal power plant Sections of the European motorway XI (to MNE)
BIH	Banja Luka (Split motorway) 45 MW unit at Tuzla thermal power plant 350 MW Banovici thermal power plant 300 MW Stanari thermal power plant
MNE	Renewal Ship Fleet European motorway XI (to SRB)
MKD	Railways modernization-European corridor X Motorway construction
ALB	European motorway XIII (to MKD) Industrial park I Durres

Sources: EBRD.

CHAPTER

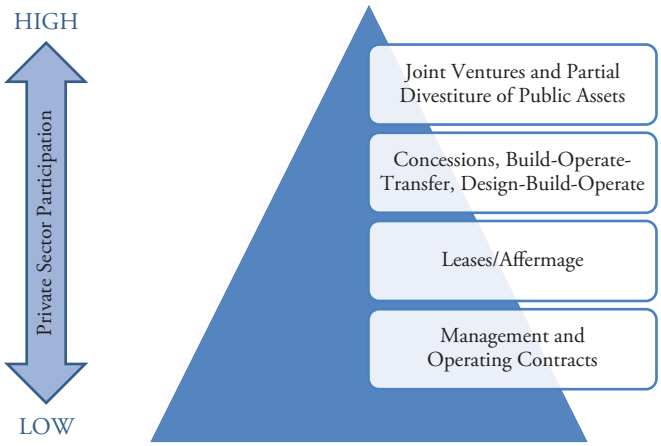
6 Public-Private Partnerships

Insufficient fiscal space and public sector inefficiencies make private financing of infrastructure investment attractive. Public-private partnership (PPP) initiatives can be a viable option to mobilize private savings, increase efficiency, and provide value for money. To the extent that PPPs only delay budgetary expenditures, they do not change the total net present value of government spending. However, PPPs could provide other benefits if they are well planned and managed. Specifically, PPPs combine the skills and resources of both the public and private sectors through sharing of risks and responsibilities. This enables governments to benefit from the expertise of the private sector, and allows them to focus instead on policy, planning, and regulation by delegating day-to-day operations. PPPs come in different types with various degrees of private sector participation in projects, ranging from management and operating contracts to joint ventures and partial divestment of publicly owned assets (Figure 6.1).[1]

PPP investments, however, involve fiscal risks in all stages of the project cycle, including budget preparation, procurement, financing, and managing performance-based contracts. PPPs can generate large explicit and implicit contingent liabilities (for example, guarantees), and encourage off-balance operations that reduce transparency. It is notable that in the Public Investment Management Assessment studies for the Western Balkans, the scores for management of PPPs were among the worst (Figure 3.7). It will be important to for the governments to take the lead in planning and managing PPPs to ensure that their potential benefits are realized, while managing their fiscal costs and risks. The five key elements for ensuring government success in PPPs include (1) sound planning and project selection; (2) strong fiscal institutions with sufficient control of the ministry of finance at each stage of

[1]See https://ppp.worldbank.org/public-private-partnership/agreements for a detailed discussion of various types of PPPs and sample agreements associated with infrastructure projects.

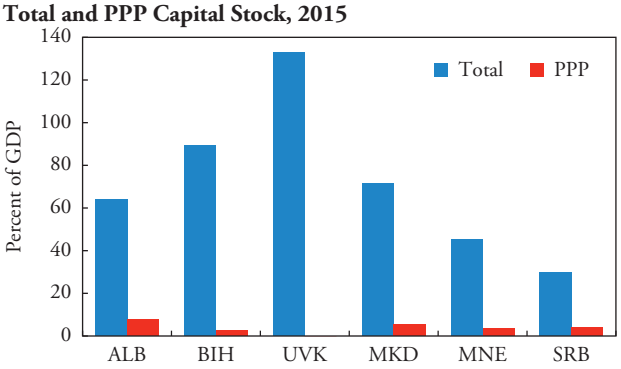
Figure 6.1. Types of Public-Private Partnership Agreements



Source: IMF.

Figure 6.2. PPP Initiatives in Western Balkans

Total and PPP Capital Stock, 2015



Sources: IMF, FAD database; and IMF staff calculations.
Note: PPP = Public private partnership.

the PPP process, including possible contract renegotiation; (3) strong legal frameworks; (4) strong budgeting, accounting, and reporting practices; and (5) appropriate fiscal risk analysis at the project level.

The region's experience with public-private partnerships has been limited, but is likely to scale up in the period ahead. The experience with PPP projects has been limited due to various factors, including the small size of national markets, inadequate legal and institutional frameworks, and perceived regional political risks (Box 6.1 and Figure 6.2; see Gjebrea and Zoto 2014). Governments' limited capacity to make credible long-term commitments has also been blamed for the "high PPP mortality rate," as indicated by the tendency to launch PPPs for projects that are not sufficiently mature or have been poorly prepared (see Epec 2014). In the future, however, the ongoing EU integration process may help reduce political risks, while regional integration, including through multilateral investment planning, could accelerate the enlargement of specific markets. In the road, transportation, and energy sectors, integrated planning for the Western Balkans could prove useful for attracting both domestic and foreign private investors.

Box 6.1. The PPP Experience for the Development of the Tirana International Airport

Following decades of isolation, Albania lacked adequate air transport infrastructure during its first decade of transition. Both financial and human resources were inadequate for planning and developing a new airport. Therefore, the government of Albania decided to invite private partners with sufficient experience to participate in the development of Tirana International Airport (TIA), with the objective of establishing an international airport of European standards to connect Albania with other European countries safely and with high levels of service. Following a tender, Albania signed a concession agreement with an international consortium, led by a German company (Tirana Airport Partners) in 2005. The concession consisted of an investment of €50 million for 20 years, mainly in the airport's physical infrastructure. During this period, TIA would be granted a monopoly on all commercial air traffic in Albania.

The new terminal opened in 2007, with the public-private partnership (PPP) framework broadly achieving its objectives. Benefiting from visa-free access to Schengen for Albanians, travel has continued to experience strong growth and passenger numbers have tripled since the concession was signed. The overall quality of services is good, and TIA has achieved its targets related to quality, environment, health and safety, and social responsibility.

However, TIA may not have benefited the development of Albanian air transport as much as could be possible. The investors followed a business model based on relatively high landing fees, focusing on European legacy carriers. Low-cost airlines were almost absent from TIA, although they account for the bulk of growth in air traffic in neighboring countries. Many Albanians travel by bus to airports in Kosovo, Montenegro, and FYR Macedonia, and the relatively high costs of flights to Albania may also have affected inbound tourism.

The government decided to renegotiate the concession agreement to allow a second international airport to operate in Albania, hoping that a competing airport could attract low-cost airlines and tourist flights. The revised 2016 contract extends the operation agreement by several years in return for rescinding the monopoly. A completed but postponed airport in northern Albania was supposed to open, and a tourist airport near the beaches in the south was also considered, but for now TIA remains the only commercial airport in the country. At the same time, the owners of Tirana Airport Partners agreed to sell their interests to Chinese investors. The new owners are following a more expansionist business model, marketing the excess capacity of the airport more aggressively. Low-cost carriers are now a frequent at TIA and travel options are expanding.

The PPP achieved some main objectives, but important lessons can be learned. Albania secured construction and operation of a modern airport of high standards, allowing

Box 6.1 *(continued)*

for continued strong growth in travel demand and imposing only minimal fiscal risks on the country. The investment, however, could have been better designed from the onset, facilitating stronger traffic growth, increasing revenue growth associated with higher levels of activity, and positioning Albania more competitively in the regional aviation market.

CHAPTER

7 Economic Dividends of Infrastructure Development: Quantitative Evidence

Infrastructure investment, growth, and debt sustainability are related. This chapter explores these relations using two approaches. First, the chapter simulates a general equilibrium model to approximate the responses of growth and public debt to an exogenous shock driven by a public investment surge. Second, the chapter uses a panel regression to estimate the impact of closing infrastructure gaps on growth.

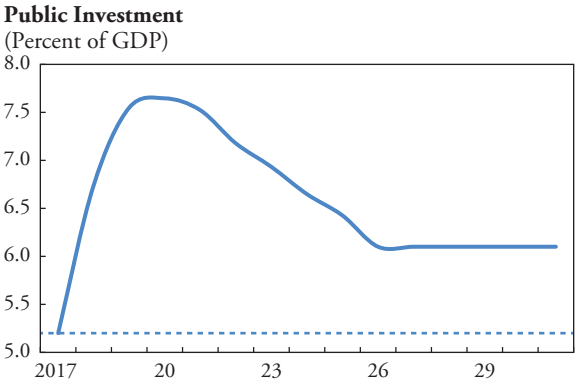
Model-Based Simulations

The simulations compute in a general equilibrium model the effects of an increase in public investment in infrastructure of 15 percent of GDP over eight years. This surge corresponds to the median size of the top projects in the Western Balkans countries' project pipelines, while its duration is designed to approximate the EU-funded project cycles (Figure 7.1).[1] A key underlying assumption is that a permanent increase in public investment will also be needed to maintain higher capital stocks.

Model-based simulations of a surge in public investment provide a useful framework for assessing dynamic interactions of key variables under different scenarios. The framework was developed by Buffie and others (2012) and the model parameters are calibrated to match the economic structure and financing conditions characterizing an average Western Balkan country (see Annex III for details). External borrowing costs are assumed to reflect the region's current spreads and normal liquidity conditions in international capital markets. Domestic financing has a higher cost than external financing to reflect

[1]The EU Multiannual Financial Framework (the latest is 2014–20) sets the ceiling for the EU annual budget for a six- to seven-year period, but countries have one additional year to disburse committed resources.

Figure 7.1. Simulated Surge in Public Investment



Source: IMF staff calculations.

that long-term funding in local currency is riskier for the lender.[2] The magnitude of the surge is as in the scenario considered in the previous section. The model assumes that the economy operates at its long-term equilibrium with a closed output gap and implies an endogenous tax response aimed at ensuring debt sustainability over the long term.[3] The paper presents four scenarios, introducing them sequentially and compounding the impact. First, a baseline scenario is interacted with different levels of efficiency and productivity (Figure 7.2).[4] Next, different financing schemes are presented (Figure 7.3).

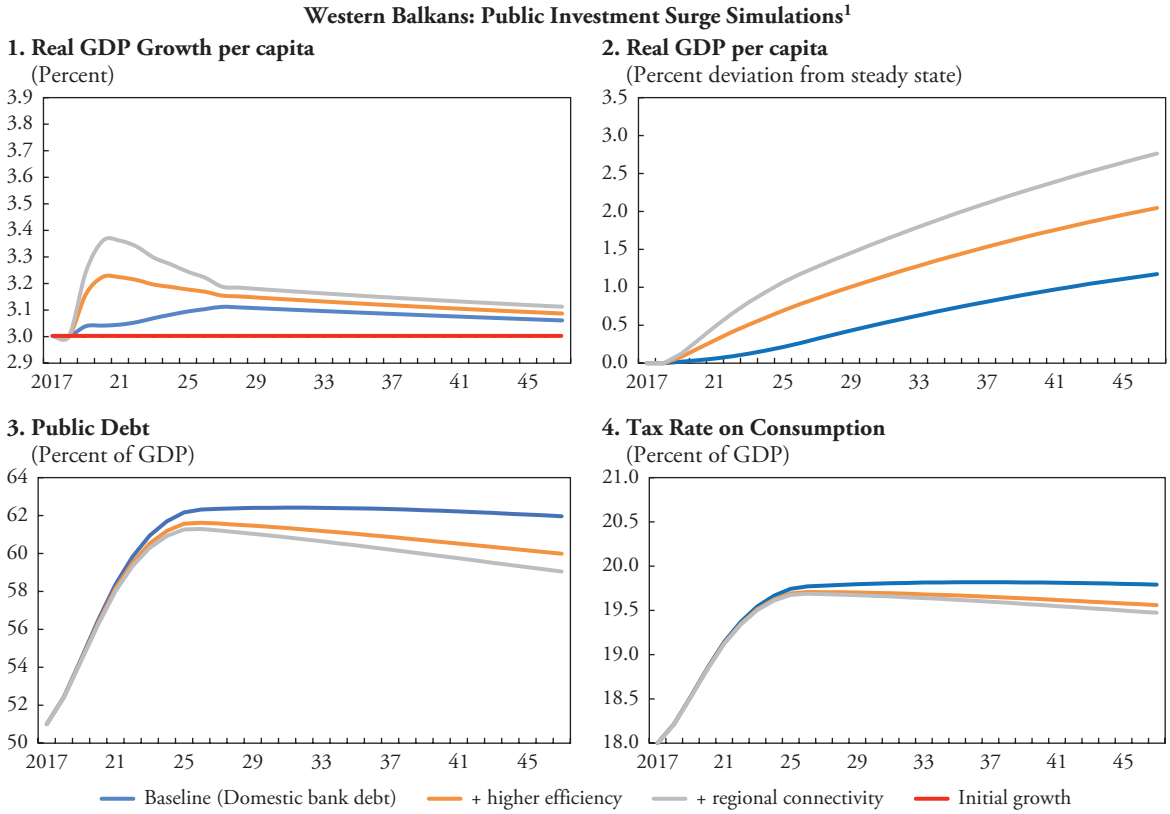
- **The baseline scenario** assumes that the surge is financed only by domestic bank borrowing. Under this scenario, growth dividends for an economy already operating with a closed output gap are found to be muted (0.1 percentage point increase in annual growth rate compared with the current projections) as the boost to aggregate demand arising from higher public investment is reduced by the crowding out of private investment and feebler domestic consumption (weakened by increased taxing of consumption needed to service the new debt). Furthermore, the effect of the investment surge is dampened by the low efficiency of public spending as only half of the public investment expenditure is assumed to be used to build the capital stock. The public debt burden increases rapidly (peaking at about

[2]This assumption is also supported by the small domestic savings in Western Balkan countries and currently favorable global financial conditions. Costs of external borrowing will increase as key central banks normalize their monetary policy in the future.

[3]Fiscal space is also needed to accommodate higher maintenance costs due to higher capital stock. In the long term the public stock of capital is higher; therefore, additional public resources are needed to keep that capital productive. In all the scenarios, the public investment surges are followed by moderate increases in the tax burden.

[4]"Efficiency" refers to the idea of reducing waste expenditures in the construction of infrastructure, while "productivity" refers to the positive spillovers of the infrastructure project on the private sector.

Figure 7.2. Effect of Reducing Public Infrastructure Gaps: Model-Based Simulations, Improved Policies Scenarios

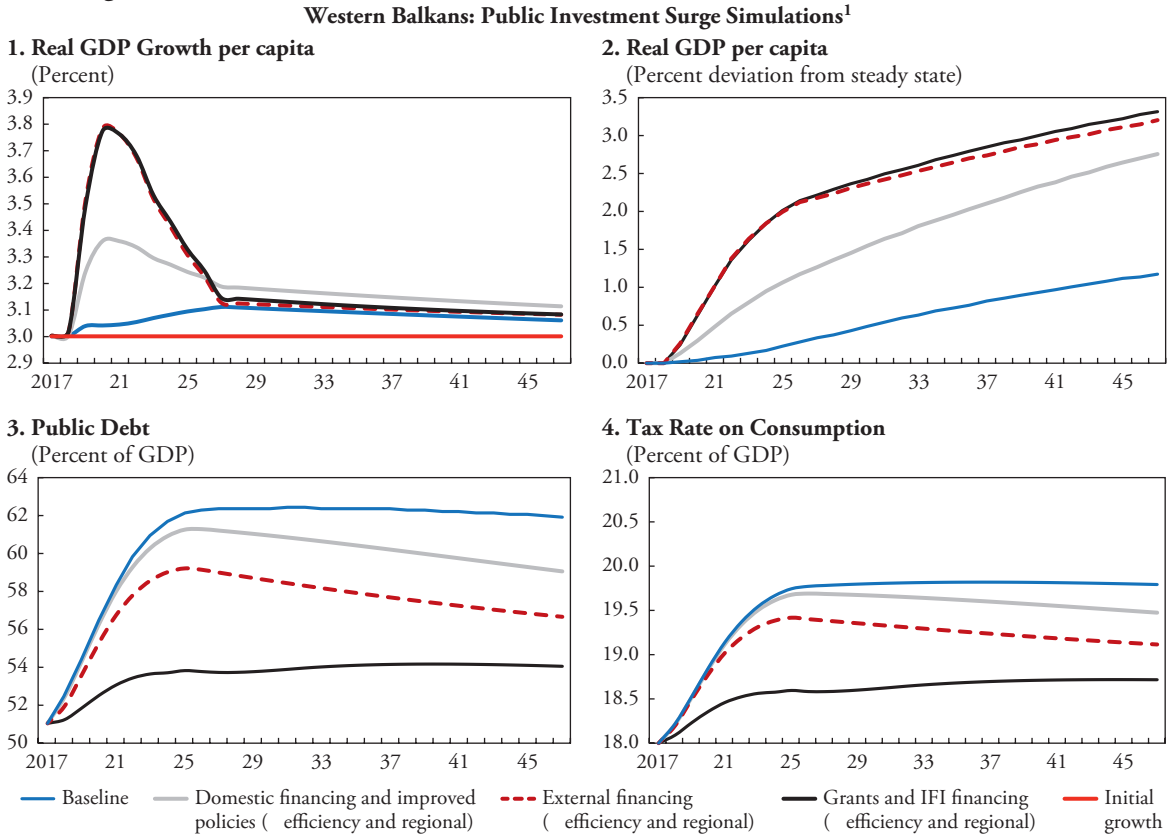


Source: IMF staff calculations.
[1]Assumes a cumulative increase in public investment of 15 percent of GDP spread over eight years; macroeconomic parameters are calibrated to average Western Balkans' levels; public investment efficiency is calibrated to average SEE-XEU (baseline) and CEE (high efficiency) levels; return on public investment is 20 percent (baseline) and 25 percent (improved policies); tax rate responds by 10 percent of the fiscal gap in the previous period; real risk free rate is 3.5 percent.

60 percent of GDP, starting from the current Western Balkan average of 51 percent of GDP), leaving debt vulnerabilities high throughout the foreseeable future.

- **The improved policies scenario** assumes that the surge in public investment is coupled sequentially with improved efficiency of public spending (by bringing public investment management frameworks to par with those in CEE countries and thus channeling three-quarters of the public investment expenditure into the capital stock buildup) and greater regional coordination in infrastructure investments (which would improve the return on public investment by improving connectivity by beefing up the reginal transportation network). Under this scenario, growth dividends are higher (0.3 percentage point increase in annual growth rate compared with the current projections), with about half of the improvement due to efficiency gains and half to productivity gains (Figure 7.3). However, the

Figure 7.3. Effect of Reducing Public Infrastructure Gaps: Model-Based Simulations, Alternative Financing Scenarios



Source: IMF staff calculations.

[1]Assumes a cumulative increase in public investment of 15 percent of GDP spread over eight years; macroeconomic parameters are calibrated to average Western Balkans' levels; public investment efficiency is calibrated to average SEE-XEU (baseline) and CEE (high efficiency) levels; return on public investment is 20 percent (baseline) and 25 percent (improved policies); tax rate responds by 10 percent of the fiscal gap in the previous period; real risk free rate is 3.5 percent. IFI = International financial institutions.

growth-dampening effect of increased taxes is still quite significant. Public debt ratios are found to decline only slowly, and debt vulnerabilities remain high throughout the medium term.

- **The external financing scenario** assumes that improved domestic policies—as per the previous scenario—facilitate access to external financing (for example, Eurobonds) at lower costs and longer maturities. Under this scenario, the crowding out of private investment is largely avoided, thus significantly improving the economic outlook (about 0.6 percentage point increase in the medium-term annual growth rate compared with current projections). In the short term, however, public investments still compete with the private sector for labor inputs as the output gap is assumed to be fully closed. Lower external financing costs require lower tax increases over the long term. The debt outlook also improves further but, once again, vulnerabilities remain.

- **The IFI and grant financing scenario** assumes that, in addition to improved policies, the surge in public investment is financed by an equal mix of grants and IFI financing. This is the most favorable scenario as it would eliminate both the crowding out of private investment and the need to significantly increase the tax burden on the economy to service the debt. This combination of grant and IFI financing results in higher growth (0.8 percent at the peak), which together with the favorable financing effectively prevents any significant increase in debt.

The key takeaway from the simulations is that public infrastructure development is likely to speed up income convergence. The analysis suggests that an appropriately designed and regionally coordinated public infrastructure development, coupled with strengthening of public investment management frameworks, could significantly increase per capita income. Under the most favorable scenario, full implementation of regional connectivity projects, already included in countries' project pipelines, would imply a long-term improvement in the level of real GDP per capita in the range of 3.5 percentage points above and beyond what would have been achieved under the steady state over the forecast horizon. Keeping in mind that additional investments would be needed to fully close the existing infrastructure gaps, the speeding up of the region's income convergence could be more than twice as fast.

Econometric Regressions

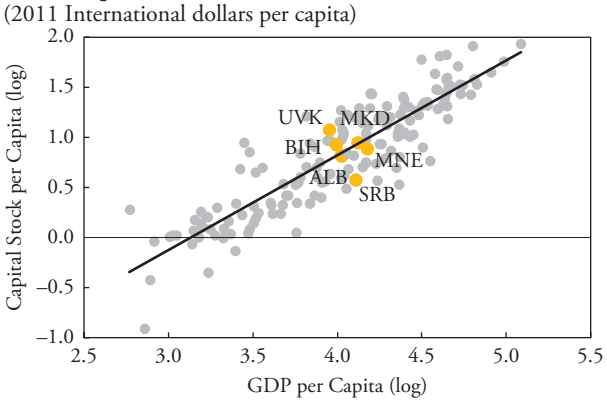
This paper estimates an empirical model linking annual real GDP growth or the per capita income gap vis-à-vis the EU average to the size of the infrastructure gap defined in Chapter 2 and other control variables (see Annex II for more details). The panel sample includes both advanced and emerging European countries, covering the period 1997–2014. The causality between public infrastructure gaps and economic prosperity are difficult to identify, generating challenges for empirical estimation.[5] Intuitively, while larger infrastructure stocks allow for a higher growth rate, richer countries have more resources to invest in infrastructure (Figure 7.4). This feeds back to support their economic growth through fostering private investment and productivity channels.

Based on the regression results, closing the infrastructure gaps would generate significant growth and accelerate income convergence. From the regressions,

[5]To address this challenge, a two-step approach is used (Annex II). First, the infrastructure gap itself is instrumented using a set of geographic, historic, and demographic variables that are believed to be correlated with the infrastructure gap but not correlated with the error term in the explanatory equation. Second, predicted infrastructure gaps from the first stage are used as instruments in the second stage.

Figure 7.4. Infrastructure-Income Link

Public Capital Stock and Income, 2015
(2011 International dollars per capita)



Sources: IMF, FAD database; IMF, WEO; and IMF staff calculations.

closing the infrastructure gap by 20 percentage points (comparable to the investment surge in the simulations, and also distributed annually as in the model-based simulations earlier in the chapter) would generate higher annual real GDP growth rates by about 0.2–0.3 percentage point over the medium term (Figure 7.5). The convergence model estimated here predicts that this effect would fade out with time as the country's income level increases. This reduction in the infrastructure gap would translate into reductions in per capita income gaps of up to 6 percentage points over the long term. The results suggest that the size of the overall impact depends also on the composition of the investment envelope. In particular, higher economic returns seem to stem from railways and motorways, given the higher weights in the underlying aggregate public infrastructure gap index.[6]

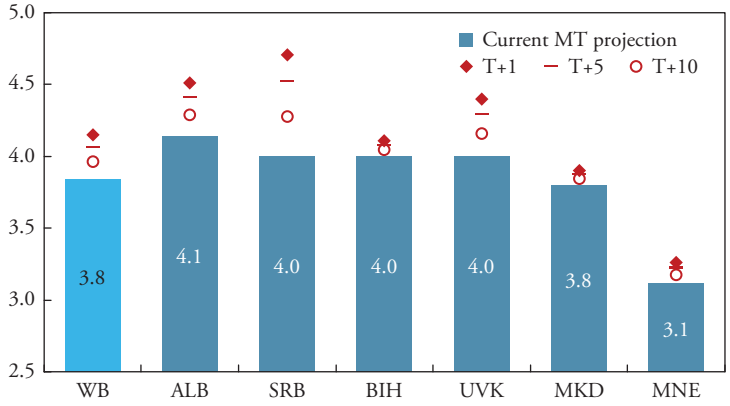
Comparability with Other Estimates

The literature studying the macroeconomic impact of public investment shocks also reports statistically significant and long-lasting effects of public investment shocks. For a sample of advanced economies, an IMF (2014) study finds that a 1 percent GDP increase in investment spending increases the level of output by about 0.4 percent in the same year and by 1.5 percent four years after the shock. Moreover, the effect is substantially stronger in countries with a high degree of public investment efficiency (0.8 and 2.6 percent, respectively) and during periods of low growth (1.5 and 3.0 percent, respectively). For a sample of emerging market economies, the estimated

[6]These results should be interpreted carefully, because they depend on using the correct weights that reflect the true economic impact of the different sectors.

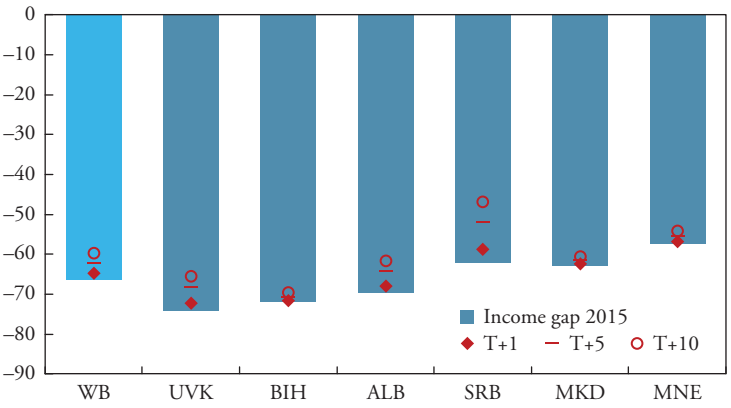
Figure 7.5. Effect of Reducing Public Infrastructure Gaps: Regression-Based Simulation

1. Impact on Medium-Term Real GDP Growth[1]
(Percent)



Source: IMF staff calculations.
[1]Infrastructure shock is 15 percent of GDP in eight years. Country-specific effects for closing the infrastructure gap are calibrated to match the estimated impact of priority projects included in the Single Project Pipeline. WB = Western Balkans.

2. Impact on Income Gap Relative to the European Union[1]
(Percent)



Source: IMF staff calculations.
[1]Infrastructure shock is 15 percent of GDP in eight years. Country-specific effects for closing the infrastructure gap are calibrated to match the estimated impact of priority projects included in the Single Project Pipeline. WB = Western Balkans.

effects are somewhat lower; about 0.3 percent in the same year and 0.5 percent four years after the shock. These magnitudes are qualitatively similar to the fiscal multipliers in structural dynamic stochastic general equilibrium models used by policymakers and academics to assess discretionary fiscal stimulus shocks (Coenen and others 2012).

Table 7.1. Implied Effects of Public Investment Shock on GDP Level[1]

	Western Balkans					WEO: Advanced Economies[2]			WEO: Emerging Market Economies[2]
		Model-based							
	Regression-based	Baseline	Improved policies[3]	External financing[3]	Concessional financing[3]	Baseline	High investment efficiency	During low growth periods	Baseline
T	0.13	0.01	0.17	0.36	0.36	0.4	0.8	1.5	0.25
T + 4	0.25	0.06	0.41	0.62	0.64	1.5	2.6	3.0	0.50

Source: IMF staff estimates.

[1]Reported figures correspond to percentage points increases in real GDP levels compared with the intial GDP level that arises from a 1 percent of GDP public investment shock. For comparability purposes, simulations for the Western Balkans assume autocorrelation of 0.5. Also for the Western Balkans, the natural trend growth (of 3 percent assumed in the general equilibrium model) was removed to make the results comparable. T 5 Year of the investment infrastructure shock.

[2]Based on estimates presented in Chapter 3 of the 2014 World Economic Outlook.

[3]Assumes high investment efficiency and regional coordination.

These fiscal multipliers are also in line with those produced by the empirical- and model-based approaches presented in this chapter. Consistent with the literature, both approaches confirm that a public investment surge—when aligned in magnitude and persistency with results reported by other authors—aimed at closing existing infrastructure gaps will have significant and long-lasting effects on economic growth and help accelerate income convergence. Once adjusted for the magnitude of the shock, the implied impact on the real GDP level under both empirical- and model-based approaches ranges between 0.1 and 0.4 percent in the near term, and 0.3 and 0.6 percent in the medium term, depending on specific policy and financing assumptions (Table 7.1).

CHAPTER

8 Policy Issues and Recommendations

The Western Balkan region faces significant public infrastructure gaps. These constrain private sector development and integration into European supply chains, and are an obstacle to faster income convergence. Scaling up public investment rates, however, is likely to prove challenging due to countries' limited fiscal space and constrained access to financing.

Western Balkan countries need to mobilize domestic resources to create fiscal room for critical infrastructure spending and cofinancing of projects. Strengthened project implementation would help better utilize available fiscal space and improve absorption of available donor financing. Additional fiscal space for a higher level of infrastructure spending could be created by making greater efforts to contain current spending and increase capital spending—a long-standing IMF recommendation and key element of program conditionality in Serbia and Kosovo.[1] This will also help reduce risks to debt sustainability and cut funding costs.

Additional space may be also generated through stronger revenue mobilization. This can be achieved by broadening the tax base through elimination of exemptions and tax incentives, while there is also room to increase the revenue intake from property taxation in most countries. In addition, tax efficiency can be improved via strengthening tax administrations to improve compliance.

Public investment management frameworks need to be significantly bolstered to improve efficiency of public spending on infrastructure in the region. Concerted efforts are needed to strengthen public investment management frameworks to improve planning, allocation, and implementation capacities

[1]Montenegro has recently announced and started implementing a fiscal adjustment strategy that would, if implemented fully, restore debt sustainability and create fiscal space for additional capital spending.

and therefore ultimately reduce waste and improve efficiency of investments. This will allow the region to fully exploit the crowding in of private investments, maximize efficiency gains related to public-private partnership (PPP) investments (while also limiting fiscal risks to public sector balance sheets), and better leverage available financial support from partners. Key recommendations from recent Public Investment Management Assessments include (1) greater coordination of all involved public bodies by clarifying their roles and responsibilities; (2) preparation and publication of a national development strategy, covering all capital and current spending; (3) enhanced appraisal processes for key public investment projects; (4) comprehensive government oversight over PPPs and state-owned enterprises; (5) transparency of governments' budget documentation by covering PPP operations and all off-budget contingent liabilities; and (6) independent ex post assessments and audits to be conducted on a regular basis.

Prioritization of infrastructure projects needs to be shielded from politicization. Establishing a defined infrastructure pipeline based on quantifiable public goals is key to contain the continuing desire of politicians to pick projects that benefit vested interests or can be easily touted in the next election. These consensus-driven planning processes need to be solely anchored in robust analysis of economic efficiency. In this regard, transparent cost-benefit justification requirements for canceling previously approved priority projects may help shield project priorities from the political cycle.

Scaling up public infrastructure needs to be financed largely by external sources, leveraging stronger regional coordination. This calls for a dominant role for official donor and multilateral financing on concessional terms. This will free scarce domestic resources for private sector investments, improve project selection and implementation, and mitigate debt sustainability risks. Greater regional coordination in developing infrastructure would help maximize growth returns on investment, improve the region's investment attractiveness and European integration, and help secure financing from the EU, international financial institutions, and bilateral donors. Given capacity constraints, Western Balkan countries could delegate more to supranational entities, including the Western Balkans Infrastructure Framework and international financial institutions, for the preparation and execution of regional projects.

Possible implications of infrastructure investment on external balances also need to be carefully considered. As infrastructure investment increases, imports of investment goods would increase, resulting in a deterioration of current account balances. A sharp widening of the current account could pose macroeconomic challenges, especially if the payoffs from investment in terms of higher potential GDP take time to materialize. Thus, trade-offs

between economic growth and internal and external imbalances need to be a key element of any policy discussion on scaling up public infrastructure in the region.

Public infrastructure investments need to be complemented by strong policies and renewed reform momentum. While these results suggest that income convergence returns on public infrastructure investments can be significant, it is important to recognize that closing large income gaps between Western Balkan countries and the EU would require far more than simply closing infrastructure gaps. Thus, investments in public infrastructure should not be seen as a substitute for a wide range of structural reforms and prudent macro-financial policies needed to stimulate growth and speed up income convergence.

Annex I. Measuring Infrastructure Gaps

Measuring infrastructure gaps is complex. Two key challenges are measuring the quality of infrastructure and aggregating different kinds of infrastructure. Aggregation is complex as different kinds of infrastructure can complement or substitute each other—for example, railways can substitute highways or air transport. Country sizes and geographical features imply optimal infrastructure can differ across countries. The literature to date has not been able to develop a consensus measure of infrastructure gaps and the consensus is that it is possible to get only some approximations to show some key features.

Infrastructure gaps are approximated by considering six key indicators that reflect the quantity of infrastructure. The infrastructure gap analysis focuses on a few infrastructure sectors with higher impact on growth. It includes transport measured by highway density, railway density, and air passengers per capita. It considers energy generation measured by the installed capacity to generate electricity per capita. The telecommunication sector is covered by telephone and cell phone lines per capita, and broadband connections per capita. Each indicator is benchmarked relative to the EU average. A positive gap means the infrastructure of a country is above the EU average. The limited coverage and lack of quality dimension are two shortcomings of this measure. Given data limitations to construct long time series, the proposed measure is a reasonable second best.

Infrastructure gaps will be measured by the following:

Aggregate infrastructure gap	Telephone/cell phone lines per capita
	Broadband subscriptions per capita
	Installed capacity to generate electricity per capita
	Air passengers carried per capita
	Highways per km² after controlling for population density
	Railroad per km² after controlling for population density

$$Infrastructure\ gap_{i,j,t} = \left[\frac{Indicator\ j_{i,t}}{average\ (Indicator\ j)_{EU,t}} - 1 \right] * 100$$

Where: j = telephone/cell phone lines per capita, broadband subscriptions per capita, installed capacity to generate electricity per capita, air passengers carried per capita, highways per km² after controlling for population density, railroad per km² after controlling for population density
i = country name

For example, for installed capacity to generate electricity in Albania, the gap is the following:

$$Infrastructure\ gap_{Elect.,\ ALB,t} = \left[\frac{Installed\ capacity\ to\ gen.\ electricity_{ALB,t}}{Installed\ capacity\ to\ gen.\ electricity_{EU,t}} - 1 \right] * 100$$

For highways and railroads, the gaps are calculated relative to the average EU, but adjusted for population density. The adjustment addresses the issue that countries with higher population densities have, on average, higher transportation infrastructure (motorway and railway) density. For example, the infrastructure gap for Albania is constructed by comparing Albania motorway and railway density with the density of a theoretical Albania country in the EU. This country has the same population density as Albania, but it is equipped with the average motorway and railway density characterizing the EU. The following is the infrastructure gap for highways in Albania:

$$Infrastructure\ gap_{highways.,\ ALB,t} = \left[\frac{Highways\ per\ km^2{}_{ALB,t}}{Highways\ per\ km^2\ (ALB)_{EU,t}} - 1 \right] * 100$$

Highways per square kilometer $(ALB)_{EU,\,t}$ results from a simple regression of highways per square kilometer on population density over the EU average. Then the highways per square kilometer for Albania is projected using the estimated coefficients and Albania population density.

Aggregating different indicators gaps is also challenging. Aggregate infrastructure gaps are calculated using weights inversely related to the volatility of the indicator across time. The intuition is that infrastructure indicators are a combination of actual information and noise (Moore and Moore 1985; Moore 1983, 1990). Then, series with high volatility are likely to have a high noise component. Consequently, the aggregate gap is constructed using weights that are inversely related to the volatility of the indicator gap.

$$Aggregate\ infrastructure\ gap_{i,t} = \sum_{j} w_j * Infrastructure\ gap_{i,j,t}$$

$$w_j = \frac{1}{\frac{\sum_i Std_i\,(Infrastructure\ gap_{i,j})}{\#\ of\ countries}}$$

where w_j approximates the inverse of the standard deviation of each gap. When the indicator gap has high volatility, it assigns low weight. When the indicator gap has a low volatility, it assigns high weight.

A robustness check of gaps using equal weights show similar results:

$$Aggregate\ infrastructure\ gap_{i,t} = \sum_j \frac{Infrastructure\ gap_{i,j,t}}{6}$$

The data sources for the infrastructure indicators are:

Variable	Source
Telephone/cell phone lines per capita	World Bank, World Development Indicators (WDI); and completed with data from national statistics offices
Broadband subscriptions per capita	World Bank, WDI; and completed with data from national statistics offices
Installed capacity to generate electricity per capita	International Energy Agency
Air passengers carried per capita	World Bank, WDI; and completed by national statistics offices
Highways per km^2 after controlling for population density	International Road Federation; and country authorities' data
Railroad per km^2 after controlling for population density	World Bank, WDI; and completed by national statistics offices

Source: IMF staff estimates.

Annex II. Regression Results

The impact of infrastructure is estimated with a simple convergence regression. The regression of drivers of growth includes infrastructure gap index and standard controls. The control variables are FDI-to-GDP ratio, openness ratio, government consumption-to-GDP ratio, the average inflation for the previous five years, log population, and the log of GDP per capita five years earlier. While the regression estimates mainly the long-term effects, the presence of the lagged income allows for some dynamics analysis. With time, the improvement in growth fades as the country reaches a higher income, reflecting the decreasing marginal return on capital.

Estimating the impact of infrastructure on growth is complicated by the endogeneity of infrastructure. It is challenging to identify the causality between growth and infrastructure. Therefore, to overcome this correlation issue, a two-stage least squares regression was used. At the first stage, the infrastructure gap is instrumented with some variables that are considered to be exogenous. Infrastructure gaps are instrumented using the following variables: the log population, percent of urban population, distance to Brussels, years since industrialization (based on Holzner, Stehrer, and Vidovic (2015)), and indices of political stability and fighting corruption from the World Governance Indicators database.[1] At the second stage, real GDP growth per capita is regressed on the instrumented infrastructure gaps and the control variables.

The regression results suggest that infrastructure has a positive impact on real GDP growth. The data sample includes 39 European countries for the period 1997–2015.[2] It includes advanced and emerging market economies

[1]See http://info.worldbank.org/governance/WGI/.

[2]The sample includes Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Kosovo, Latvia, Lithu-

as most of the variability in infrastructure results from cross-country dimension of the sample. The baseline estimates (Table AII.1, column I) highlight that the aggregate infrastructure gap has a positive and significant effect on growth. Closing a (negative) infrastructure gap by 1 percentage point is estimated to be associated with 0.1 percent higher growth. The impact would likely decline over time as the additional infrastructure increases income and thereby growth falls following a convergence hypothesis. Alternative estimates that explore the role of different kinds of infrastructure (Table AII.1, column III) point out that physical infrastructure (highways, railways, and electricity generation capacity) has the highest significant impact on growth. The estimated impact of telecommunications and broadband internet seems low, but one possible reason for this weak relation is that these infrastructure gaps do not account for quality, a key feature of telecommunication infrastructure. Estimates that use an aggregate infrastructure gap based on a simple average of sectors (Table AII.1, column II) show similar trends as in the baseline. Estimates based on the first difference of infrastructure gaps present positive impacts on growth but they are not significant (Table AII.1, columns V and VI). Finally estimates that relate income gaps and infrastructure gaps are shown in Table AII.2.

Data sources:

Variable	Source
Real GDP per capita	IMF, WEO; and completed with World Bank, World Development Indicators (WDI)
FDI-to-GDP	IMF, WEO
Openness (exports 1 imports in percent of GDP)	IMF, WEO
Government consumption	IMF, WEO
Average inflation for previous 5 years	IMF, WEO
Log population	IMF, WEO; and completed with World Bank, WDI
Log of GDP per capita 5 years earlier	World Bank, WDI
Urban population	World Bank, WDI
Years since industrialization	Holzner, Stehrer and Vidovic (2015). The measures consider industrialization after the country GDP reaches USD 2000 at 1990 international prices.
Political stability index	World Bank, World Governance Indicators
Fighting Corruption index	World Bank, World Governance Indicators
Distance to Brussels in Km	Based on Mayer and Zignago (2011)

ania, Luxembourg, FYR Macedonia, Moldova, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, and United Kingdom.

Table AII.1. Dependent variable: Real GDP Growth per Capita

	Baseline	Robustness Check				
	I (Instrumental Variables)	II (Instrumental Variables)	III (Instrumental Variables)	VI (OLS)	V (Instrumental Variables)	VI (Instrumental Variables)
Infrastructure gap 6 sectors (weights 5 inverse standard deviations)	0.106			0.02		
	[0.025]***			[0.013]		
Infrastructure gap 6 sectors (average 6 sectors)		0.086				
		[0.023]***				
Highways per 1000 square Km after controlling for density			0.063			
			[0.029]**			
Railways per square Km after controlling for density			0.042			
			[0.015]***			
Telephones (fixed 1 mobile) per 1000 inhabitants relative to EU			0.003			
			[0.030]			
Electricity generation installed capacity per capita relative to EU			0.09			
			[0.022]***			
Air passengers per capita relative to EU			0.035			
			[0.022]			
Broadband subscribers per 100 inhab. relative to EU			20.016			
			[0.015]			
Diff. infrastructure gap 6 sectors (weights 5 inverse standard deviations)					0.461	
					[0.312]	
Diff. infrastructure gap 6 sectors (average 6 sectors)						0.194
						[0.123]
FDI inflows to GDP	0.000	20.002	0.002	20.003	20.002	20.004
	[0.010]	[0.010]	[0.013]	[0.010]	[0.010]	[0.010]
Openness 5 exports 1 imports / GDP	0.017	0.028	0.032	0.019	0.024	0.024
	[0.007]**	[0.007]***	[0.011]***	[0.006]***	[0.007]***	[0.007]***
Government consumption to GDP	20.272	20.307	20.284	20.235	20.258	20.28
	[0.073]***	[0.073]***	[0.107]***	[0.061]***	[0.081]***	[0.076]***
Average inflation past 5 years	26.99	27.338	210.166	28.539	215.827	216.441
	[3.344]**	[3.277]**	[4.587]**	[3.183]***	[5.616]***	[5.505]***
Log population	0.757	0.983	2.169	0.45	0.606	0.629
	[0.261]***	[0.286]***	[0.525]***	[0.216]**	[0.264]**	[0.261]**
Log GDP per capita in ppp (t 2 5)	26.569	26.713	213.453	23.299	22.453	22.59
	[1.033]***	[1.153]***	[2.983]***	[0.628]***	[0.558]***	[0.523]***
Constant	13.504	9.039	9.595	6.956	1.043	1.516
	[5.297]**	[5.063]*	[6.431]	[4.331]	[5.144]	[5.055]
Obs	491	491	491	494	455	455
Countries	39	39	39	39	39	39
Adj. *R*-squared	0.12	0.14	0.05	0.17	0.15	0.16

Source: IMF staff calculations.

Note: Standard errors in square brackets. *p , .1; **p , .05; ***p , .01. OLS 5 Ordinary least squares. EU 5 European Union.

Table AII.2. Dependent variable: Income gap relative to EU

	Baseline	Robustness Check	
	I (Instrumental Variables)	II (Instrumental Variables)	III (OLS)
Infrastructure gap 6 sectors (weights 5 inverse standard deviations)	0.280 [0.064]***		0.047 [0.034]
Infrastructure gap 6 sectors (average 6 sectors)		0.194 [0.050]***	
FDI inflows to GDP	20.011 [0.016]	20.015 [0.015]	20.022 [0.014]
Openness 5 (exports 1 imports) / GDP	0.023 [0.012]*	0.035 [0.012]***	0.032 [0.011]***
Government consumption to GDP	20.434 [0.154]***	20.439 [0.158]***	20.397 [0.145]***
Average inflation past 5 years	29.14 [5.445]*	210.507 [5.383]*	214.828 [5.003]***
Income gap with EU (t 2 5)	0.763 [0.031]***	0.774 [0.031]***	0.863 [0.020]***
Constant	8.32 [3.599]**	5.91 [3.529]*	4.55 [3.297]
Obs.	491	491	494
Countries	39	39	39
Adj. *R*-squared	0.98	0.98	0.99

Source: IMF staff calculations.

Note: Standard errors in square brackets. *p , .1; **p , .05; ***p , .01. OLS 5 Ordinary least squares. EU 5 European Union.

Annex III. General Equilibrium Model

A general equilibrium model—developed by Berg and others (2015)—was used to simulate a public investment surge. The model allows analysis of the interactions between GDP growth, public investment, and public debt. The key feature is the public investment-growth nexus. The model was originally designed for low-income countries (including emerging market economies) and widely applied by IMF staff. Western Balkan countries share several features of low-income countries, such as significant remittances, limited financial development, and large financing from international financial institutions.

The model follows a real business cycle approach with decreasing marginal product of capital and labor. This implies that the output gap is closed before and after a shock as the prices adjust to ensure the equilibrium. As a result, the crowding-out effects will be large in the short term. Also, the decreasing returns imply that in the long term, the effects on GDP growth will be small as the economy tends to return to the steady state growth.

The model is a small open economy with two sectors and with multiple kinds of public debt. In this economy, the private sector produces both a tradable good and a nontraded good. Goods are made using private capital, public infrastructure, and labor as inputs. The model includes public and private capital; then, depending on the productivity of public capital, public investment can increase output and crowd in or crowd out private investment. Agents can also import goods either to consume or to produce capital. Private and public capital are produced using imported inputs and nontraded goods. There are two kinds of consumers: savers and hand-to-mouth consumers. There is a government that collects taxes on consumption and fees on public capital. Government funds are allocated to transfers or to build public capital.

The government has several alternatives to finance public investment. It can increase taxes, it can collect fees on the use of public capital, and it can borrow domestically, externally, or externally at concessional rates (for example, mix of EU grants and financing from international financial institutions). The model ensures debt sustainability by allowing the tax rates to respond to public debt.

The model can analyze the role of public investment frameworks and the productivity of the public capital. Public investment expenditures do not always increase the stock of public capital as part of the expenditures can be wasted—meaning the government pays *x* amount but only a fraction helps build public capital. The model allows analysis of this feature. It also considers for different levels of public capital productivity and consequently different impacts on growth.

Simulations are calibrated to reflect the structural features of an average Western Balkan country. Some of the main parameters include per capita potential GDP growth of 3 percent (based on the growth observed in 2006–16), a public debt-to-GDP ratio of 51 percent (average public debt for the region in 2016), an average tax rate of 18 percent, and a public investment-to-GDP ratio set at 5.2 percent (to match the average observed in the region in 2016). The real average domestic and external interest rates are assumed at 7 and 5 percent, respectively.[1] The efficiency of public investment framework is calibrated based on Dabla-Norris and others (2011) and the productivity of capital is assumed at 20 percent. This value is in the medium range of estimates by Dalgaard and Hansen (2005) and Foster and Briceño-Garmedia (2010).

[1]In Serbia, the average issuance spread was 475 basis points. Assuming a long-term risk-free rate of 350 basis points and that the inflation target is 3 percent implies that the real interest rate should be about 500 basis points. In Serbia, the long-term interest rates on domestic issuance were marginally above 1,000 basis points for 2013–16. Subtracting 3 percent of inflation yields about 750 basis points.

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