EUROPEAN DEPARTMENT

In collaboration with the Fiscal Affairs and Research Departments

Infrastructure in Central, Eastern and Southeastern Europe (CESEE)

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Roadmap

I. Benchmarking CESEE infrastructure

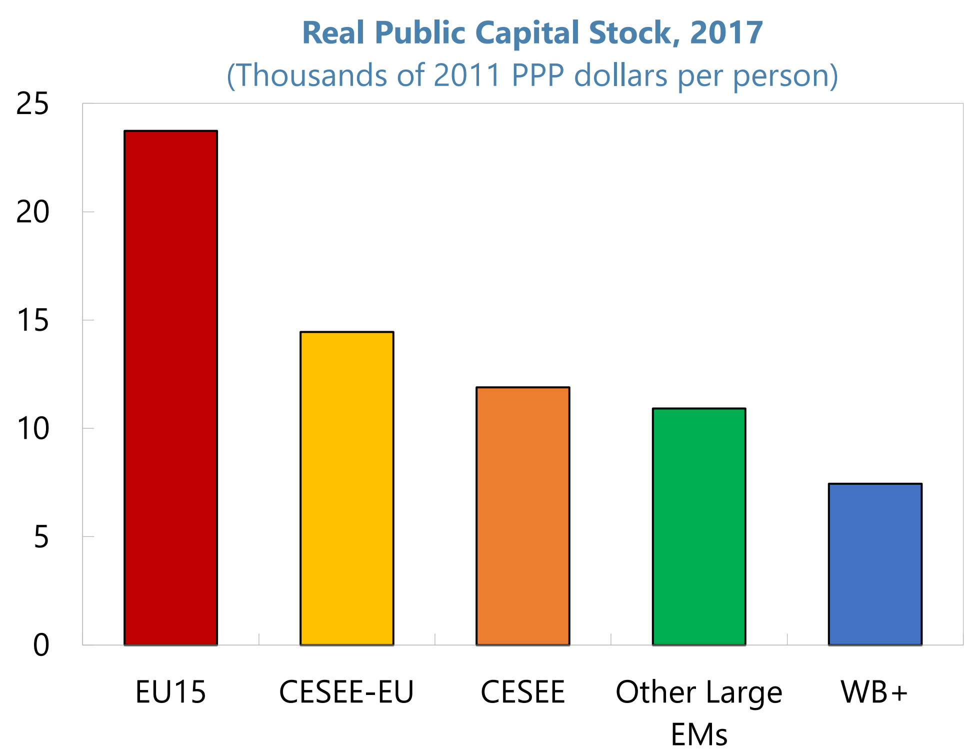
II. Macroeconomic effects of infrastructure investment

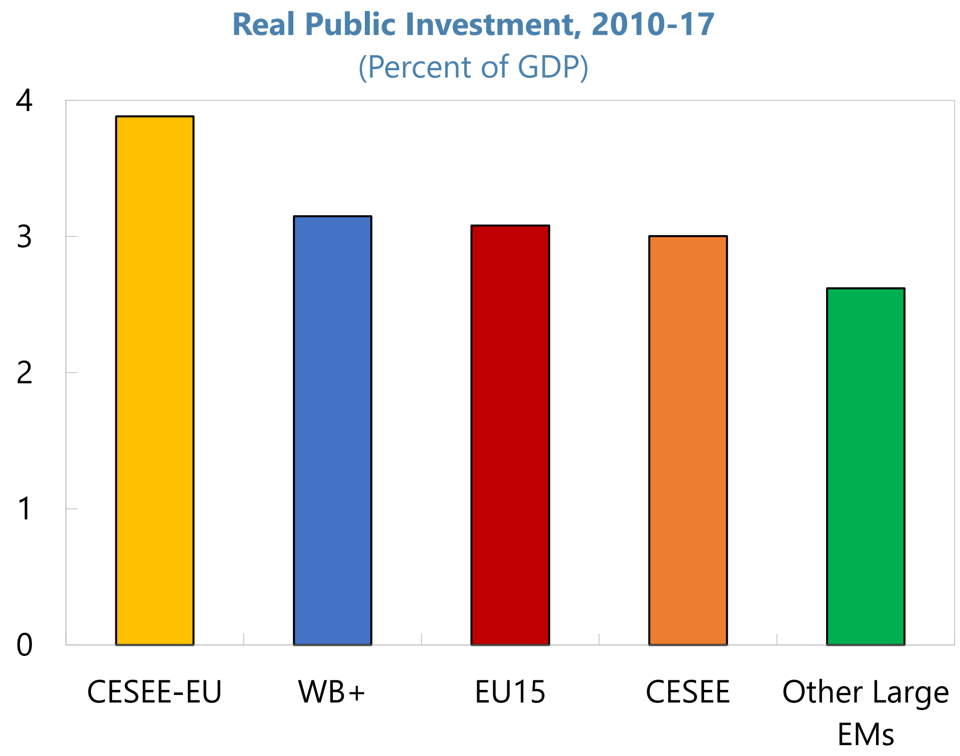
III. Getting the most from infrastructure investment and minimizing risks

- Enhancing infrastructure governance: public investment and risk management
- Strengthening private participation
- Coordinating investment across CESEE

I. Benchmarking CESEE Infrastructure

CESEE countries have only half of the per capita capital stock available in EU15





Sources: IMF, Fiscal Monitor database; WDI; WEO; IMF staff calculations.
Note: Bars indicate the weighted average in each country group. CESEE-EU includes Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia. Large emerging markets (EM) includes Russia, Turkey, and Ukraine. Western Balkans plus includes Albania, Belarus, Bosnia and Herzegovina, Kosovo, Moldova, Montenegro, North Macedonia, and Serbia.

Investment needed to close infrastructure gaps are large. Even more necessary to close gaps in quality and make infrastructure stock climate-sensitive

Comparison of Infrastructure Cost Estimates for the Next 10 Years

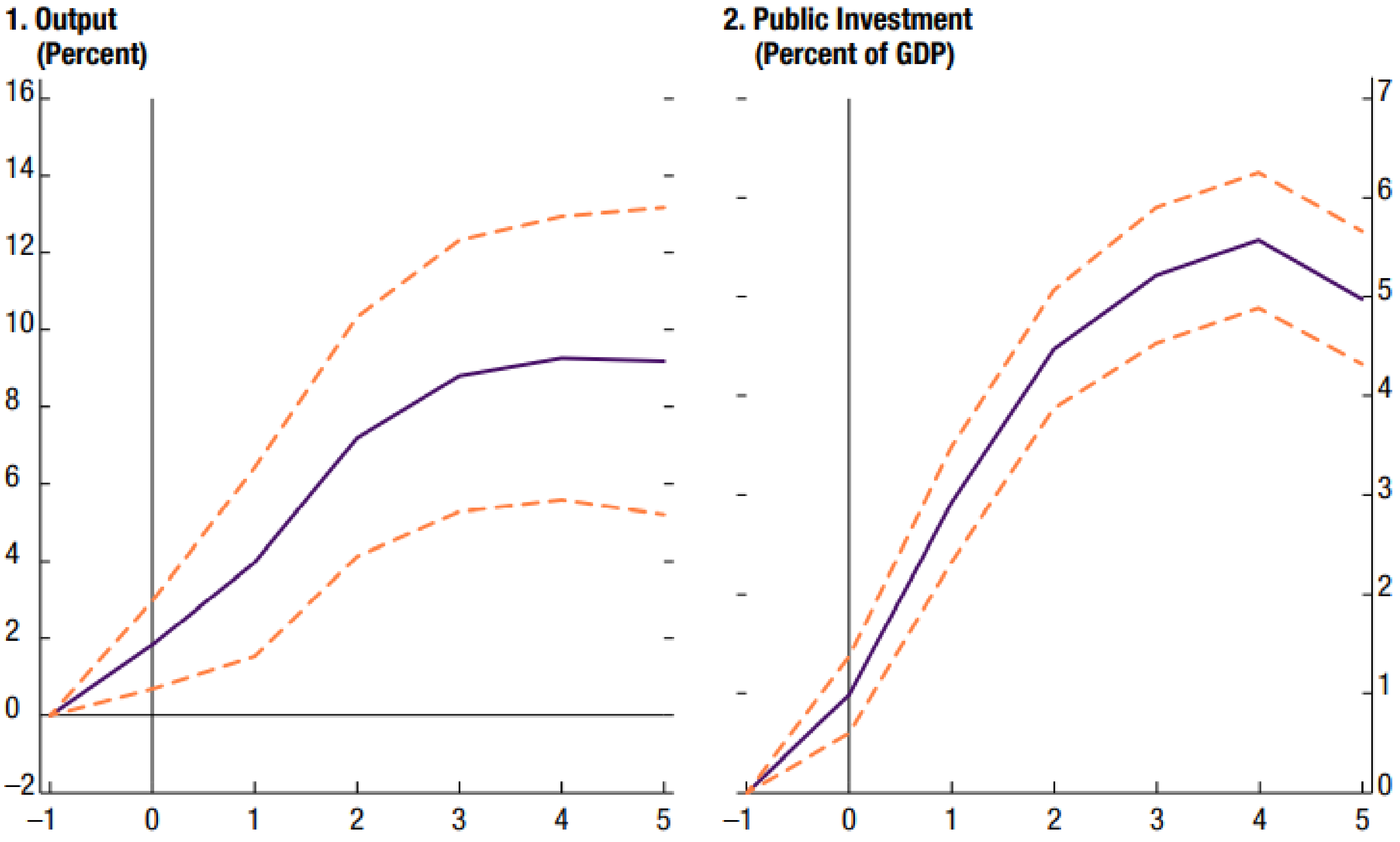
	Our estimates			Beyond the Gap (World Bank)			Global Infrastructure Hub (A G20 Initiative)
	A	B	C	Preferred	Low spending	High spending	Energy, telecom, transportation
CESEE				*(rescaled for CESEE)*			*(rescaled for CESEE)*
% of GDP/year	8.4	7.0	2.8	4.2	0.6	3.4	4.3
Total cost by 2030 (billion USD)	3670	3063	1237	1843	252	1481	1899

Note: **Our estimates**: Gaps in roads and railways are assessed in km per total land in column A, per arable land in B, and per population in C. The preferred estimate for **Beyond the Gap** assumes the following policies: Invest now in renewable energy, energy efficiency; Increase the utilization rate of rail and public transport; densify cities; promote electric mobility. The high spending scenario assumes the following policies: no investment in energy efficiency; fossil energy for 10 years followed by a switch to low carbon; allowing cities sprawl; favoring rail investments without accompanying policies. The low spending scenario assumes the following: high energy efficiency and demand management; increasing use of rail and public transport; densifying cities; reducing demand for transport through gasoline taxes.

II. Macroeconomic Effects of Infrastructure Investment

A. Empirical Estimates

Public investment booms are associated with a significant increase in output



Sources: Fiscal Monitor; WEO; IMF staff estimates.
Note: Cumulative response of GDP growth (left) and public investment as percent of GDP (right) following public investment boom episodes. The episode is normalized such that public investment as percent of GDP increases by 1 ppt on impact. *t* = 0 is the year of the shock; dashed lines denote 90 percent confidence bands. The implicit multiplier on impact is about 1.7.

B. Model Simulations

Model simulations of infrastructure investment

Motivation	• Trace the effect of public investment in general equilibrium framework • Consider the role of the efficiency of public investment • Assess consequences of alternative modes of infrastructure financing • Examine spillovers from regional coordinated investment projects
IMF's Globally Integrated Monetary and Fiscal Model GIMF	• Multi-country model • Stylized public sector (taxes, spending, public investment, public debt) • Public capital in the production function • Assumption on efficiency of public spending

Simulations using the IMF's Globally Integrated Monetary and Fiscal (GIMF) model

Shock

- Infrastructure investment is increased by 1 percent of GDP for 10 years

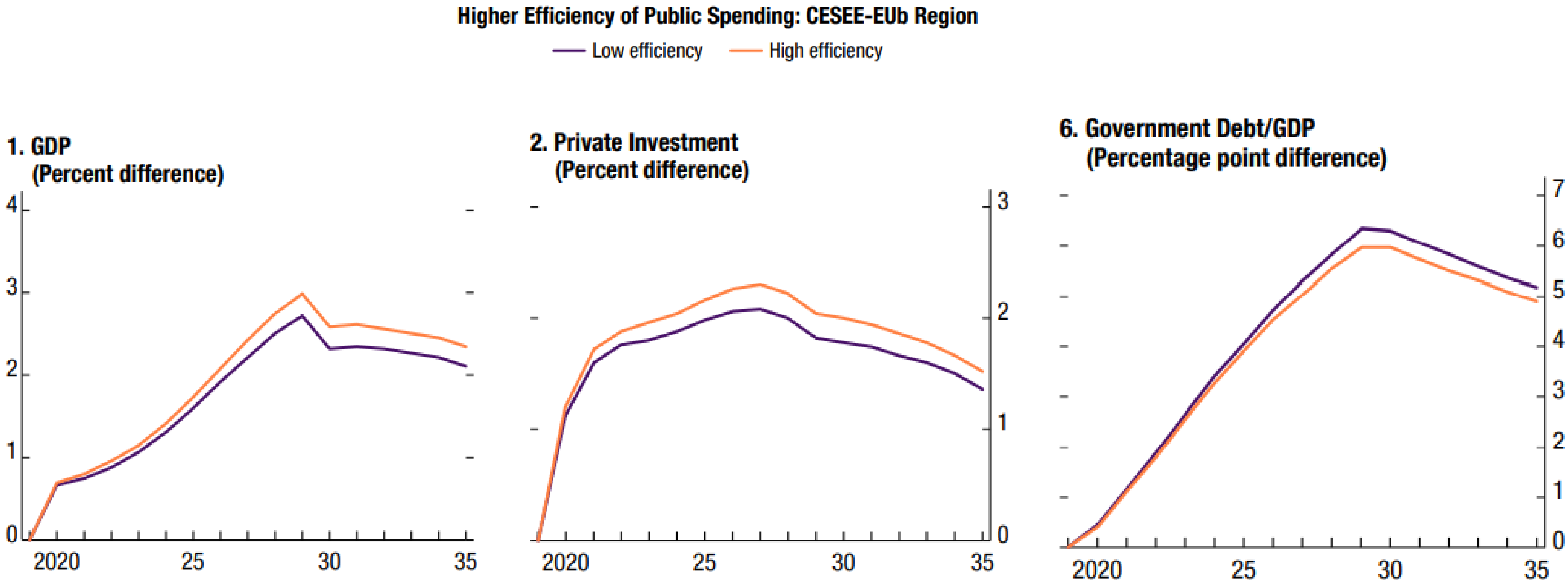
Scenarios

- Higher efficiency of public spending

Not shown (in background section)

- Cross-border projects that improve regional connectivity and lower trade barriers
- Alternative modes of financing (public debt accumulation, higher consumption taxes, lower public consumption)

Infrastructure investment: the role of public sector efficiency



Sources: IMF staff calculations.
Note: CESEE-EUb Region includes Bulgaria, Croatia, Czech Republic, Hungary, Poland and Romania.

Takeaways from empirical findings and model simulations

- The impact of higher infrastructure investment on CESEE can be significant. Raising infrastructure investment by 1 percent of GDP for 10 years can boost real GDP up by to 2.5 percent at the end of the horizon
- Higher efficiency of infrastructure investment is essential to maximize the benefits
- Coordinated cross-country infrastructure investment, which improves connectivity and lowers trade costs, could magnify the macroeconomic gains
- The pace and type of financing is critical for dynamics of public deficits and debt

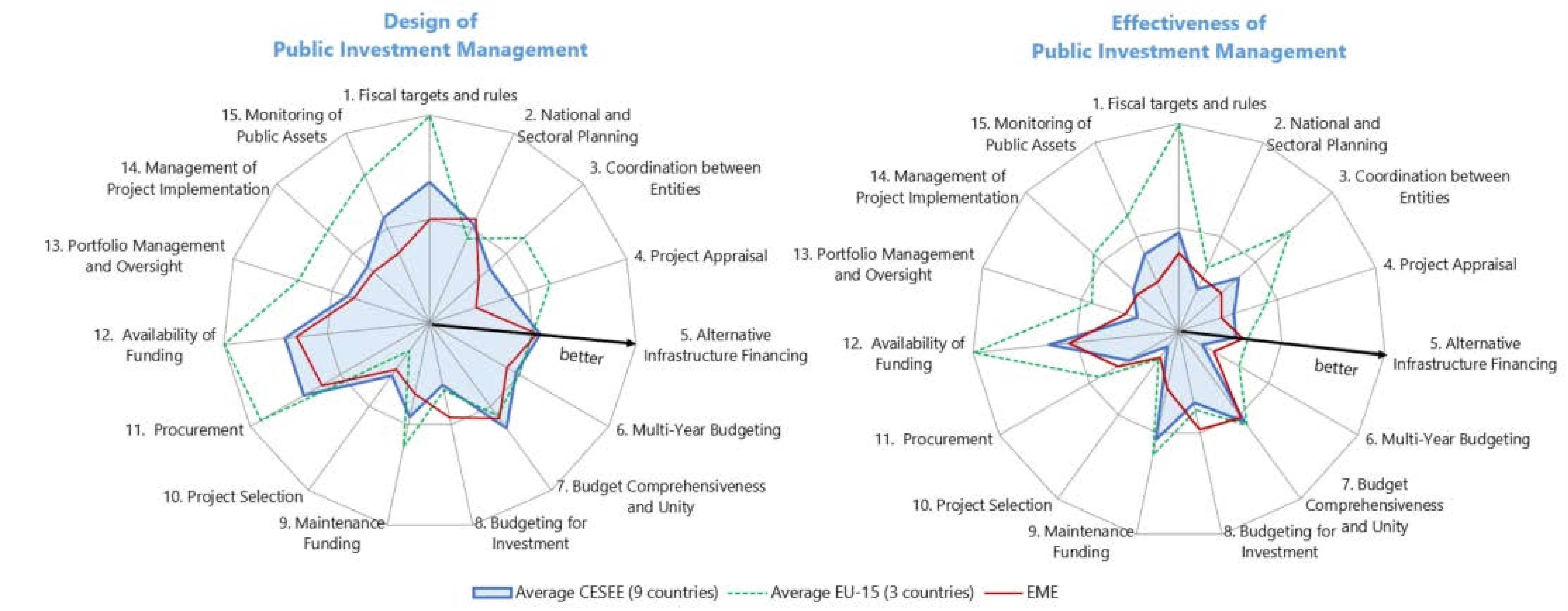
III. Getting the Most from Infrastructure Investment

The COVID-19 crisis raises the need for more and better public investment to boost short-term growth and potential output

- Strong call for public investment to support the recovery from the pandemic
  - A key tool due to its high multiplier, and discretionary and lumpy nature
  - Could crowd in private capital amid high uncertainty
  - Essential to accelerate the green and digital transformation
- Policy Implications
  - Strengthen infrastructure governance to achieve more effective and integrated public investment and risk management (esp. for PPPs) and get the most out of taxpayers' money
  - Reprioritize capital spending towards well-planned, selected, and implemented projects that can enhance long-term resilience (e.g., green and digital infrastructure), including upgrades
  - Review capacity constraints and identify potential for cross-border collaboration

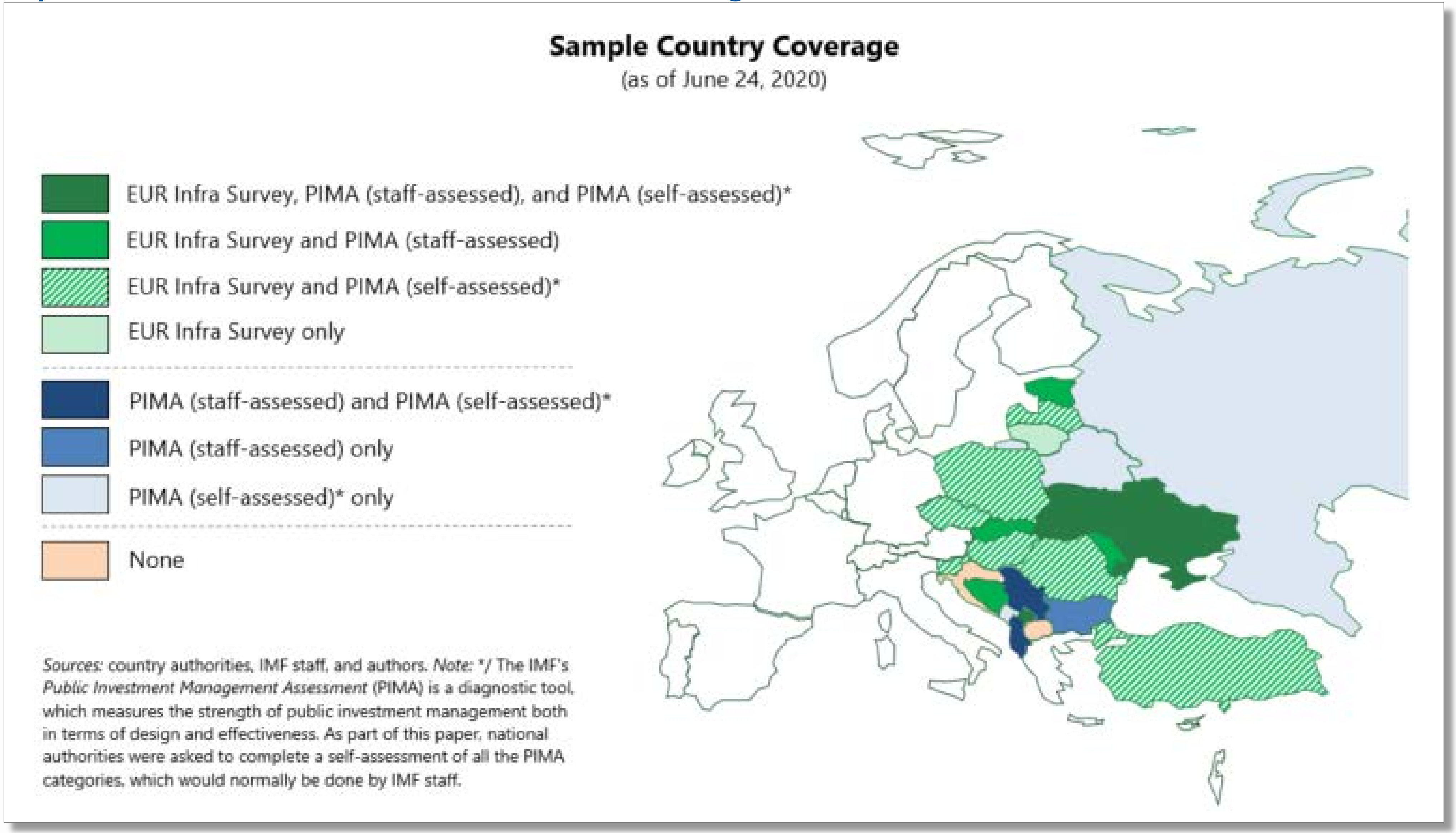
A. Enhancing Infrastructure Governance: Public Investment and Risk Management

IMF Public Investment Management Assessments (PIMA) indicate significant scope for improving infrastructure governance in CESEE, with large variation across countries



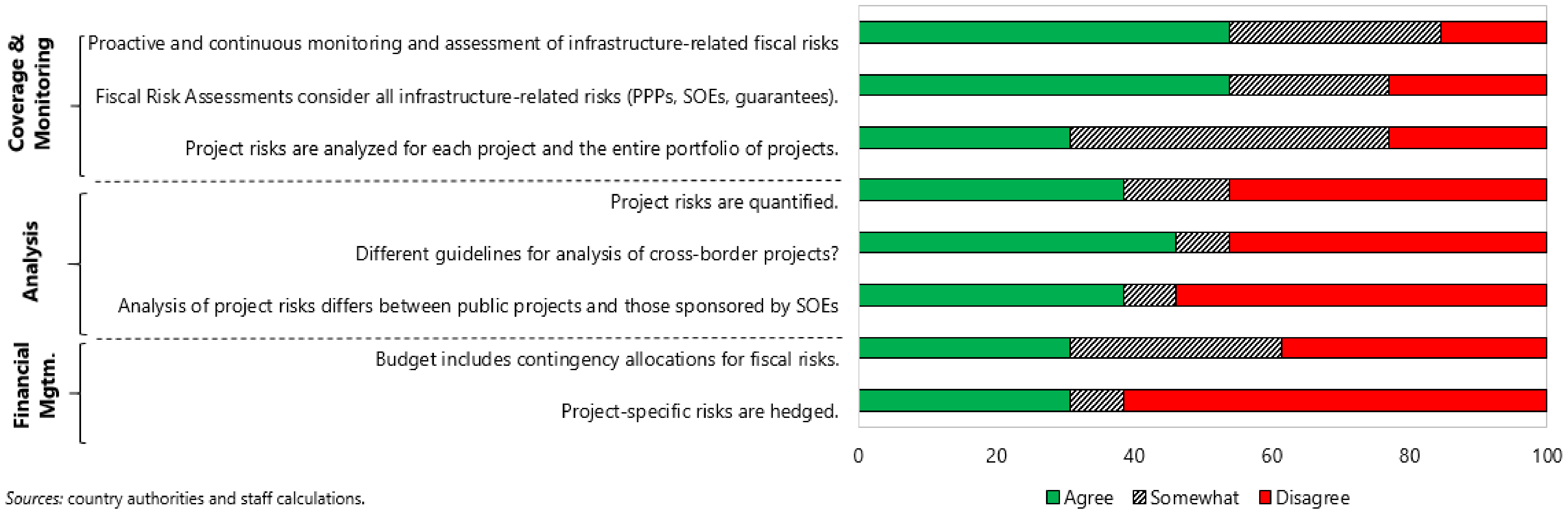
Source: IMF staff calculations based on Public Investment Management Assessments (PIMA) completed as of March 2020.

A novel IMF survey on infrastructure investment in CESEE complements these PIMA findings



According to survey, there are still sizable gaps in fiscal risk analysis and management in most CESEE countries

Infrastructure Survey of CESEE Authorities: Risk Management Practices
(Percent)

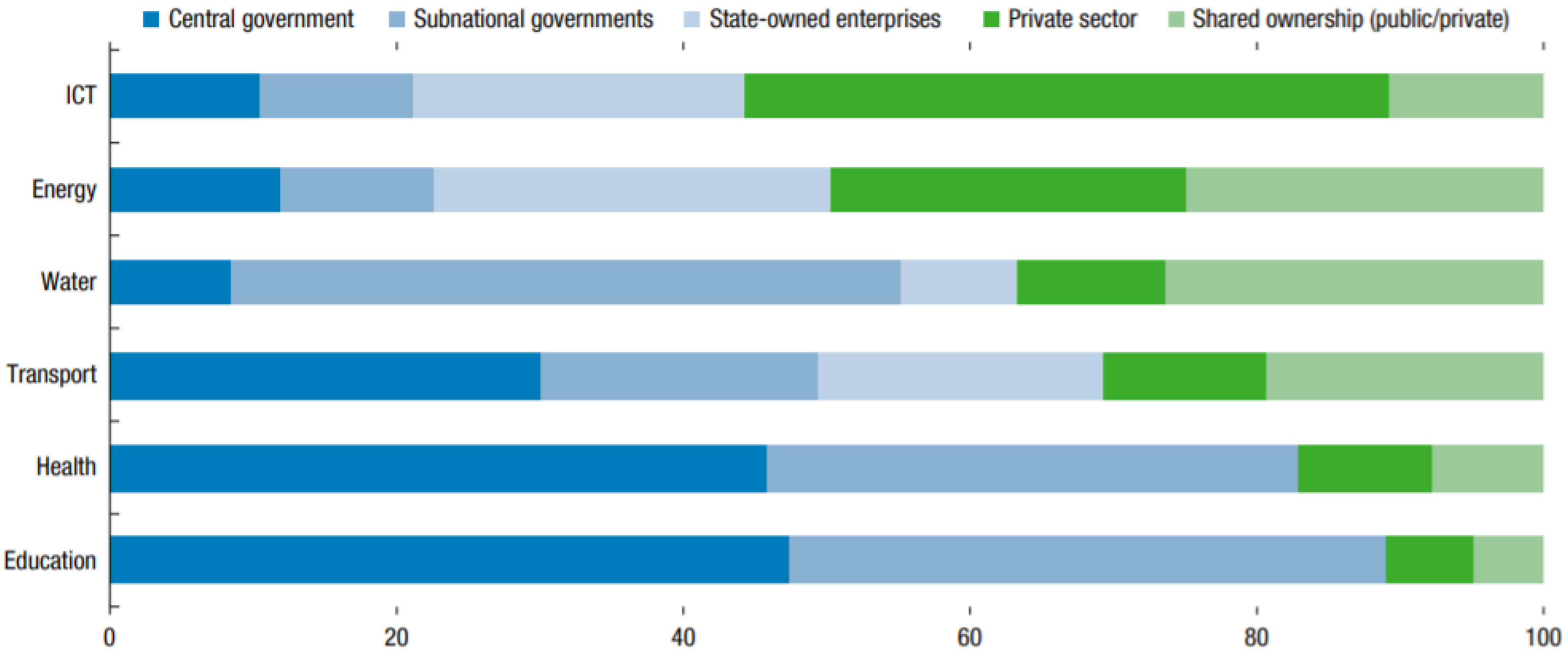


Sources: country authorities and staff calculations.

B. Strengthening Private Participation

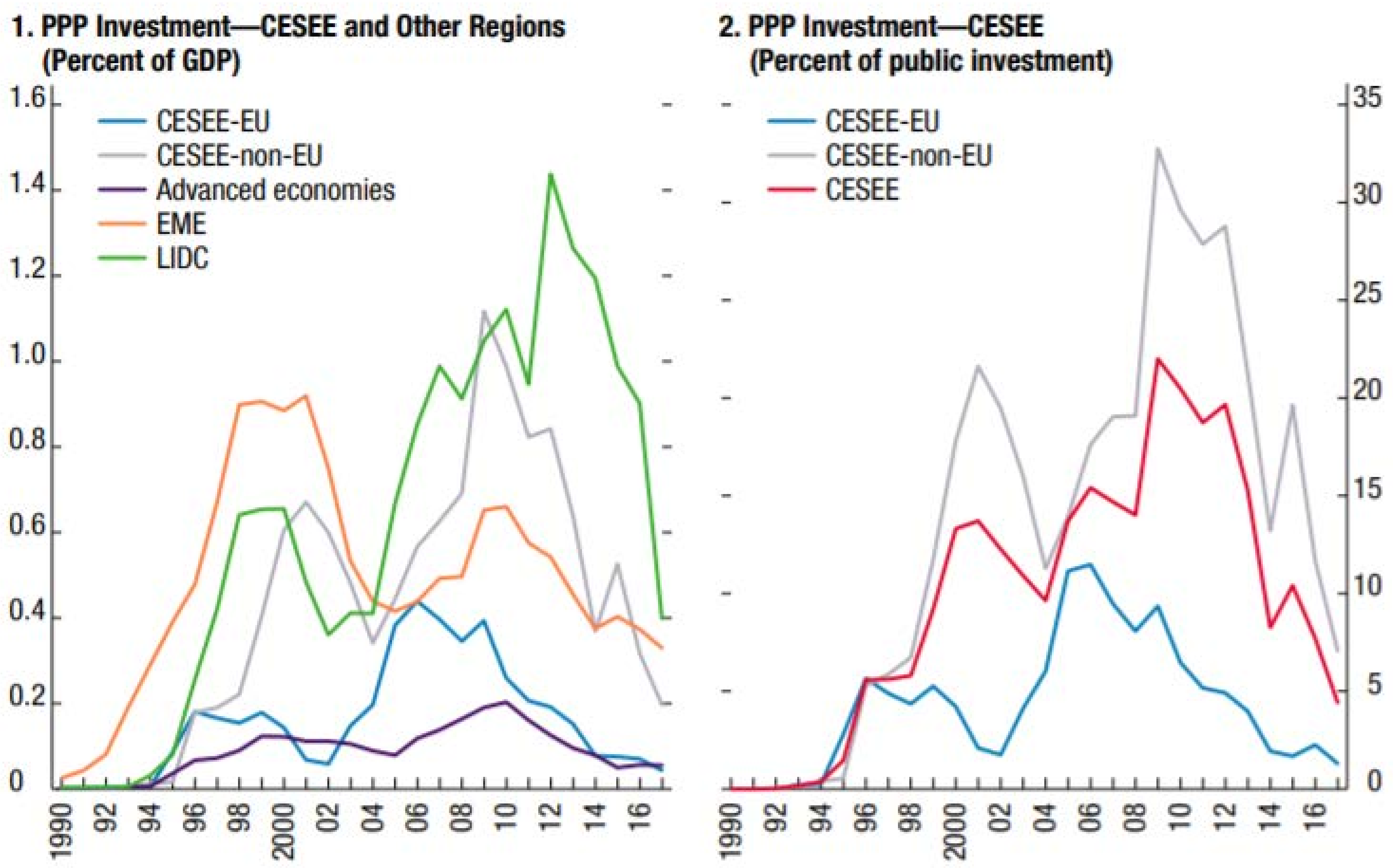
In CESEE, the private sector is involved mostly in economic infrastructure, where SOEs are also more prevalent

Infrastructure Survey of CESEE Authorities: Project Ownership by Sector
(Percent)



Sources: Country authorities; and IMF staff calculations.
Note: ICT = information and communication technology.

PPPs are the main channel for private participation in infrastructure investment in CESEE, but their relevance has declined

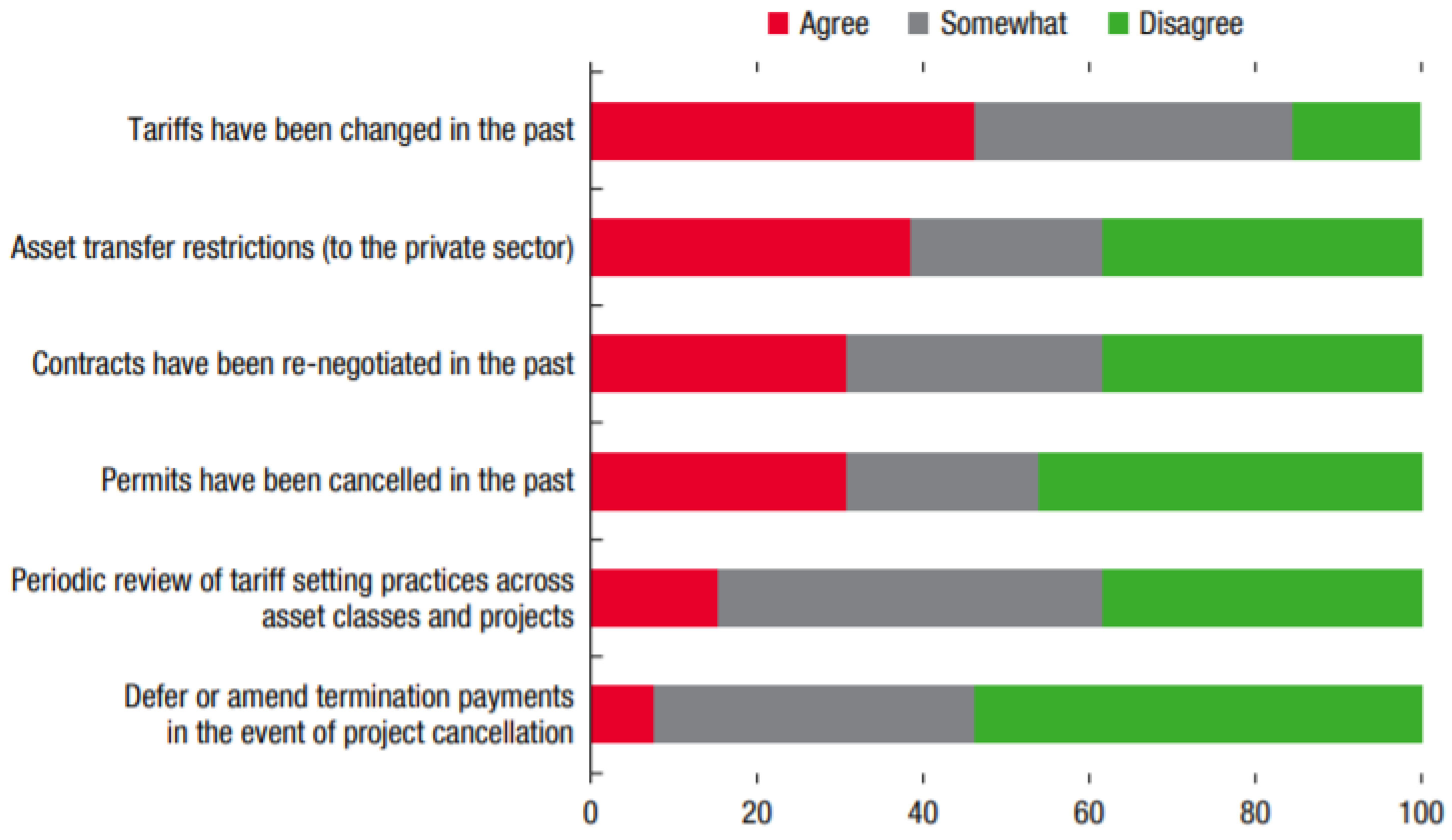


Sources: Haver Analytics; and IMF staff calculations.
Note: In panel 1, the percentage share is defined in nominal terms. For CESEE and CESEE subgroups, see Figure 1. EME = emerging market economy; LIDC = low-income developing country; PPP = public-private partnership.

Regulatory, legal and political risks are major bottlenecks to private participation in CESEE infrastructure projects

Infrastructure Survey of CESEE Authorities: Sources of Risk for Private Investors

(Percent)

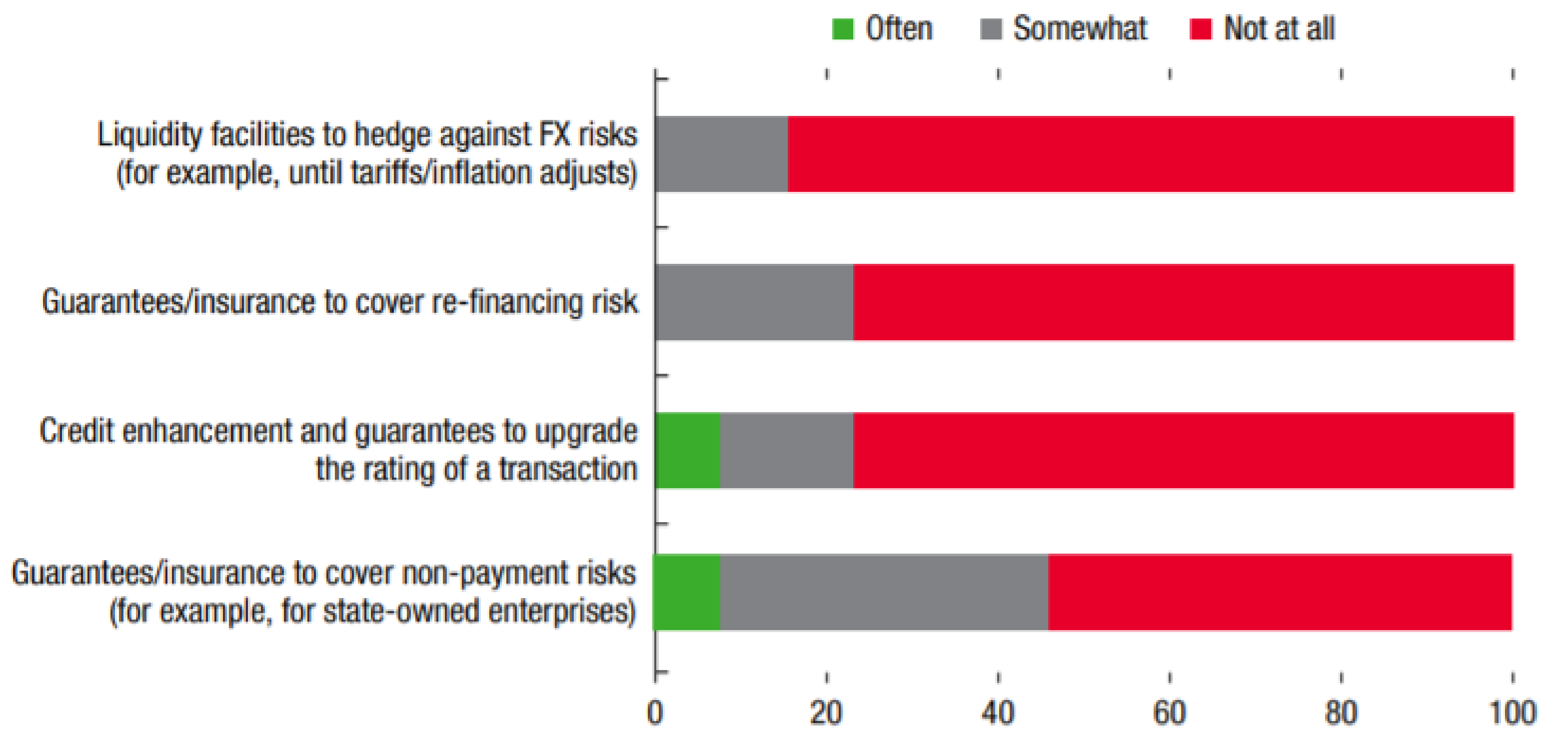


Sources: Country authorities; and IMF staff calculations.

There is a lack scalable and more comprehensive risk mitigation in CESEE, with most countries offering guarantees only

Infrastructure Survey of CESEE Authorities: Risk Mitigation Instruments for Private Investors

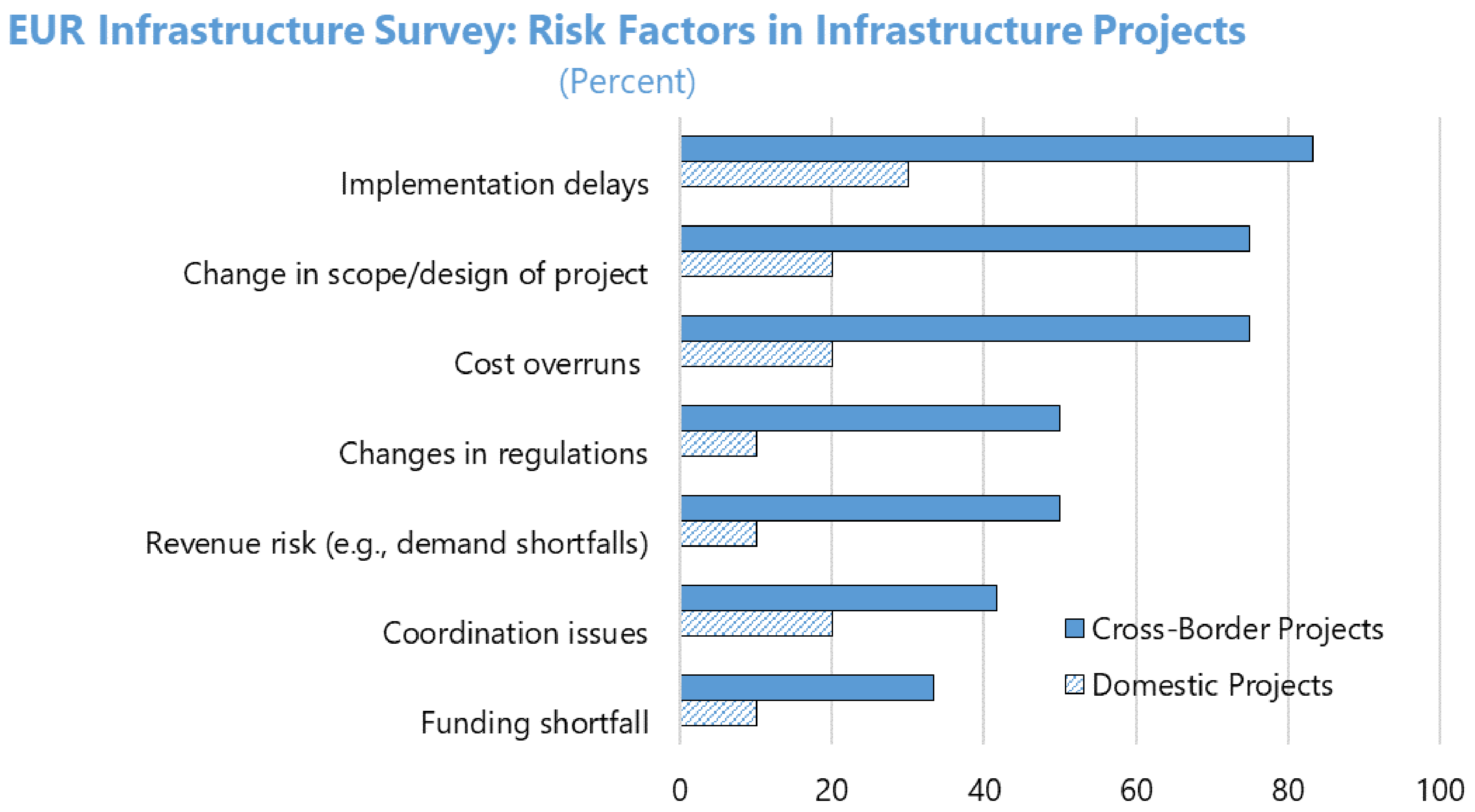
(Percent)



Sources: Country authorities; and IMF staff calculations.
Note: FX = foreign exchange.

C. Coordinating Investment across CESEE

Compared to national projects, many risks are more elevated in cross-border projects, especially implementation delays and cost overruns …

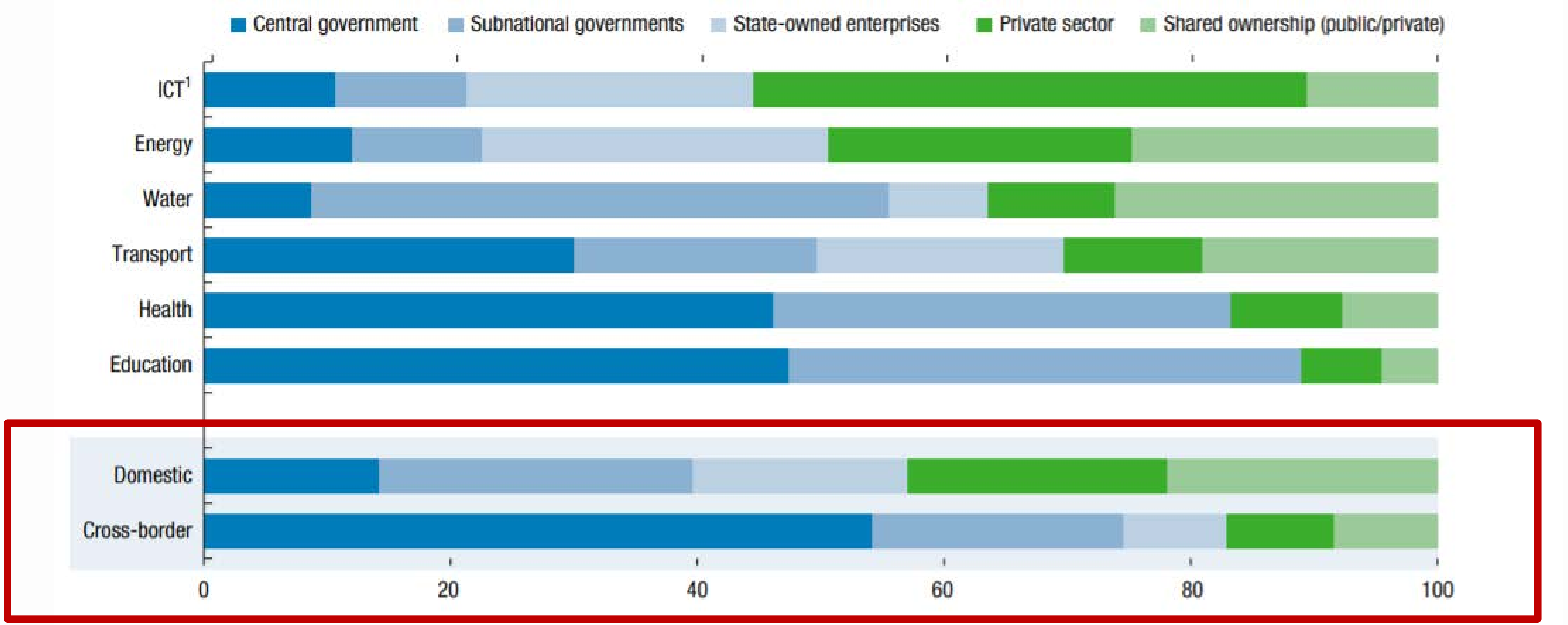


Sources: country authorities and staff calculations.

… which may explain why private participation is lower in cross-border projects compared to national ones.

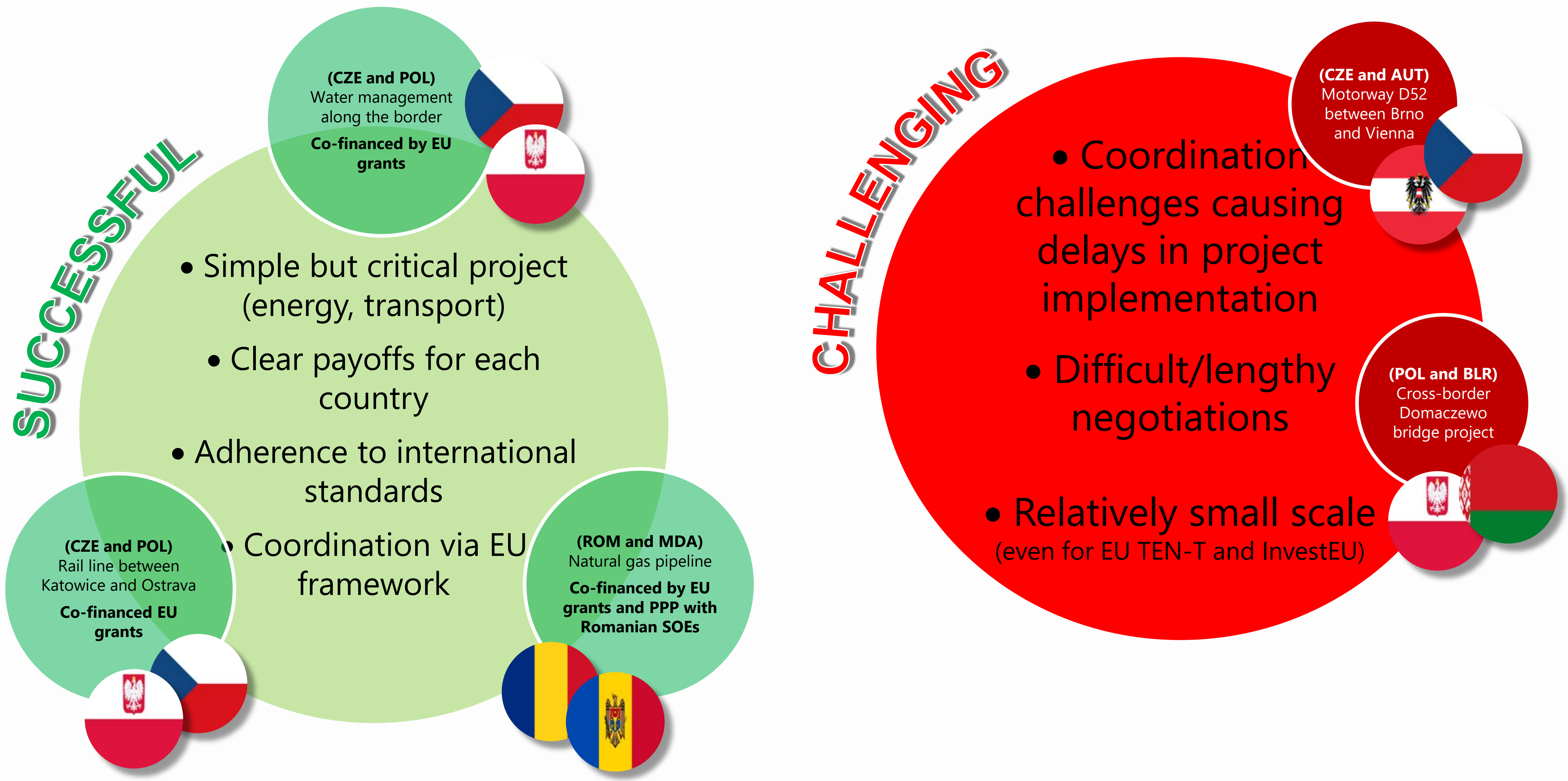
Infrastructure Survey of CESEE Authorities: Projects by Ownership

(Percent)



Sources: Country authorities; and IMF staff calculations.
Note: ICT = information and communication technology.
[1]Domestic infrastructure aggregates the shares of economic infrastructure (namely, ICT, energy, water, and transport).

Nonetheless, there are many successful cross-border projects, with the EU framework as critical factor

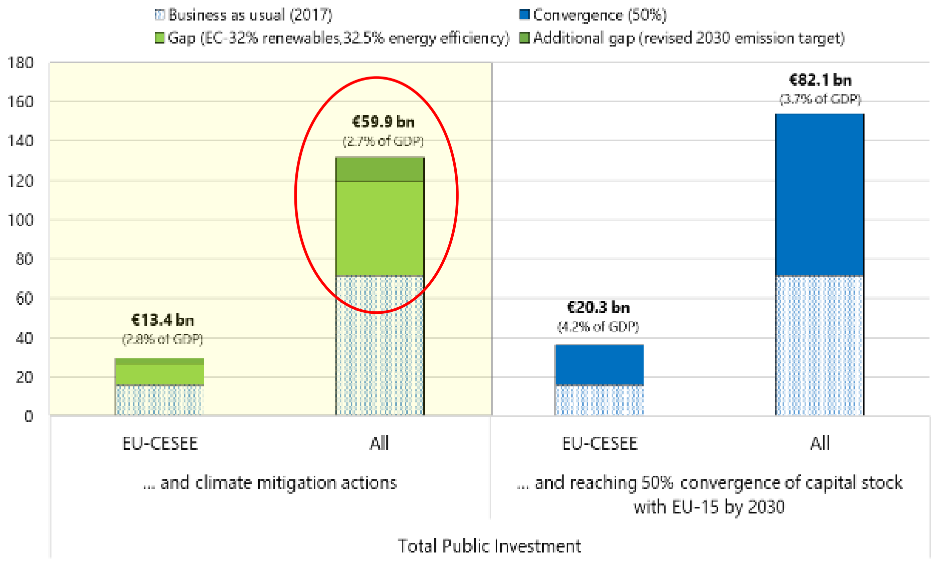


D. Enhancing Resilience and Supporting Climate Action

CESEE region will require additional public and private resources to achieve the desired “green and digital” transition

- COVID-19 lessons and recovery: (1) enhance long-term, socio-economic resilience and (2) “build better” (i.e., climate change mitigation and adaptation)
  - Reliable telecommunications/digital services, education and health care
  - Facilitate the “green” transition (renewable energy generation, low-emission transport, and energy efficiency)
  - Mitigate the impact of natural disasters and progressive global warming
- <u>Still large infrastructure gaps</u> despite considerable NGEU resources (up to €212 billion of grants and loans (~6% of GDP)) and ambitious plans for green infrastructure and digitalization
- **Additional “green” investment of ~1.5%** of GDP per year (comparable to the required capital spending for reaching 50 percent convergence with the EU15)

CESEE: Average Annual Investment Need
for Climate Mitigation (until 2030) vs. Reaching 50% Convergence to EU-15
(EUR billion, 2013 prices)



Sources: European Commission, European Investment Bank, and staff calculations. Note: EU-CESEE: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia; */ including boilers; /** includes storage, refuelling and recharging infrastructure in transport sector; estimates do not include the following other sectors/activities contributing to climate mitigation: industry (manufacturing and process-driven emissions, including cement), transport (vehicles), agriculture, and some social infrastructure (if relevant for climate change mitigation, e.g., public buildings).

Conclusions

Conclusion

- Relative to EU-15, CESEE falls short both in terms of per-capita public capital and various measures of physical infrastructure quantities, with considerable cross-country variation
    - ➢ Filling 50% of the gap will require significant investment (3-8% of GDP for 10 years)
- Scaling-up infrastructure investment is important to support the post-COVID19 recovery and speed up convergence
    - ➢ Getting the most of this investment would require better “infrastructure governance”, recognizing significant difference across countries → IMF PIMA can help identify shortcomings
    - ➢ The crisis also presents an opportunity to enhance long-term resiliency by shifting towards green and digital infrastructure
- Attracting private participation will be essential but requires better risk allocation and more effective fiscal risk management, especially in PPPs → IMF PPP Fiscal Risk Assessment Tool (P-FRAM) can provide guidance
- Cross-border projects involve coordination challenges but could yield greater growth dividends if they improve regional connectivity and integration

Background Slides

Reference

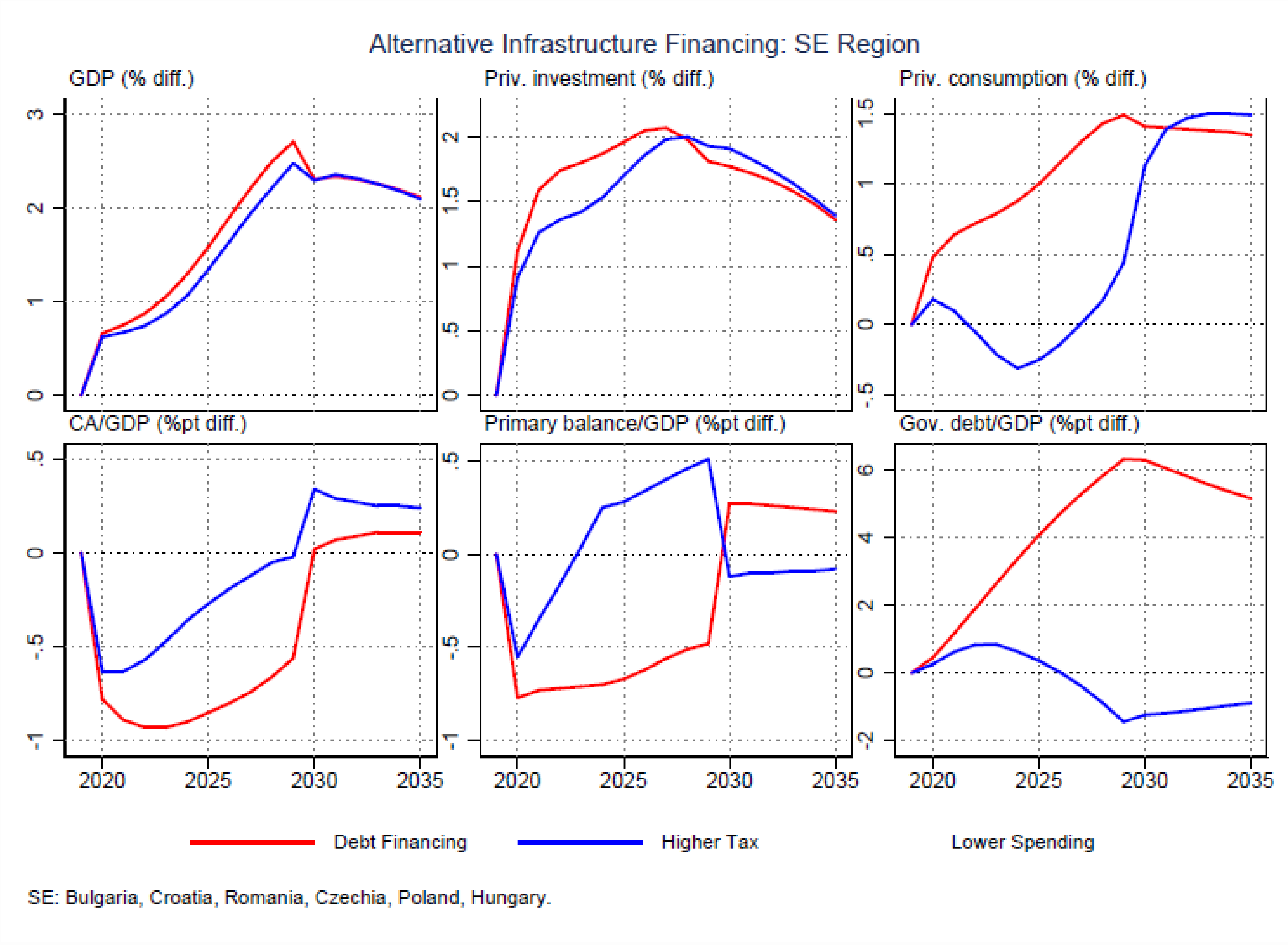
- A. Ari, D. Bartolini, V. Boranova, G. Di Bella, K. Dybczak, K. Honjo, R. Huidrom, A. Jobst, N. Jovanovic, E. Ozturk, L. Papi, M. Stone, P. Topalova, and S. Sola, 2020, "Infrastructure in Central, Eastern, and Southeastern Europe: Benchmarking, Macroeconomic Impact, and Policy Issues," Departmental Paper No. 20/11, September 28 (Washington, D.C.: International Monetary Fund), available at https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2020/09/25/Infrastructure-in-Central-Eastern-and-Southeastern-Europe-Benchmarking-Macroeconomic-Impact-49580.

Sub-regions used in GIMF

Rest of the Eurozone
Rest of the World

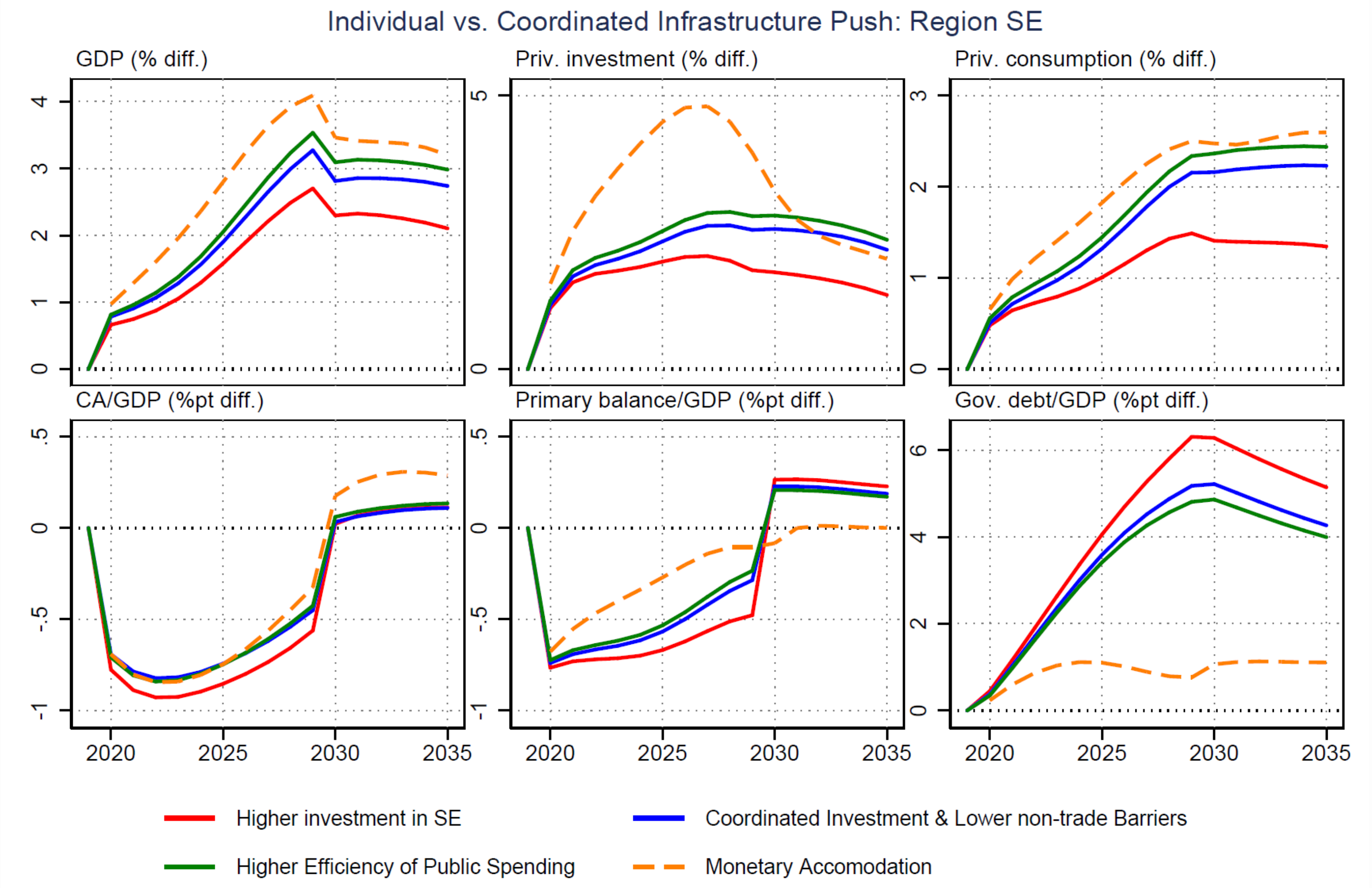
Region 1:	Region 2:	Region 3:	Region 4:
CEE-euro area	CEE-EU	Western Balkans	Large Emerging
CE	SE	WB	LM
Estonia	Bulgaria	Albania	Turkey
Latvia	Croatia	Bosnia and Herzegovina	Russia
Lithuania	Romania	Kosovo	Ukraine
Slovakia	Czechia	Montenegro	
Slovenia	Poland	North Macedonia	
	Hungary	Serbia	
		Belarus	
		Moldova	

Infrastructure investment: the role of financing



Sources: IMF staff calculations.

Infrastructure investment: the role of cross-border coordination



SE: Bulgaria, Croatia, Romania, Czechia, Poland, Hungary.

Sources: IMF staff calculations.

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