Crowding in or crowding out?

Public and private investment in the Western Balkans

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Abstract

This note examines whether public infrastructure investment crowds in private investment in the Western Balkans and how this relationship compares with the EU. Using Eurostat data for 2000-2024 and a sector-level analysis, it finds that higher public infrastructure investment is generally associated with higher private investment in the region, broadly in line with EU patterns. One sectoral difference stands out: public investment in health infrastructure generates much smaller crowding-in effects in the Western Balkans than in the EU, plausibly reflecting weaker domestic complementarity, given the limited health-related industrial base. Crowding-in effects in the region are strongest in education, followed by information and communication, while energy, water and waste, and transport show more moderate effects, and health exhibits the weakest effect. Overall, the results suggest that scaling up public infrastructure investment can mobilise private capital in the Western Balkans, with particularly high returns in education. Where fiscal space is constrained, prioritising investment towards sectors with stronger crowding-in effects can improve impact, while stronger support for domestic health-related capabilities could increase the payoff from health infrastructure spending.

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1. INTRODUCTION

This note examines whether public investment crowds in private investment in the Western Balkans and how this relationship compares with the EU. The question is highly relevant for the region, which continues to face persistent investment gaps, weak productivity growth and limited convergence with EU living standards (see converge2.eu). As public investment is expected to play a central role in addressing infrastructure deficits, supporting the green and digital transitions, and strengthening human capital, understanding its interaction with private investment is crucial for designing effective growth strategies.

We use Eurostat data for the period 2000-2024 to analyse the relationship between public and private investment at the country-sector level. It focuses on six key sectors – energy, water and waste, transport, information and communication technologies, education, and health – and explicitly compares the Western Balkans with the EU. The aim is not only to assess whether public investment crowds in private investment, but also to identify the sectors in which this effect is strongest, thereby providing guidance for more effective public investment prioritisation in the Western Balkans.

The remainder of the note is structured as follows. After a short examination of the relevant literature, we present the data and offer a brief descriptive overview of public and private investment in the Western Balkans. The subsequent section sets out the econometric approach and discusses the main results, highlighting similarities and differences between the Western Balkans and the EU. The final section draws out the key policy implications, with a particular focus on how public investment can be used more effectively to mobilise private capital in the region.

2. SHORT OVERVIEW OF RELATED LITERATURE

A substantial body of research over the past decade indicates that public infrastructure investment can yield significant macroeconomic benefits, often crowding in private investment, rather than displacing it. In advanced economies, multiple studies find that higher public investment boosts output and encourages private capital formation. For example, using data for OECD countries, Abiad et al. (2015) show that increasing public infrastructure spending raises GDP in both the short and long term, crowds in private investment, and even reduces unemployment. These effects tend to be strongest under conditions of economic slack and accommodative monetary policy, which amplify demand-side gains, and when investment efficiency is high. Consistent evidence comes from a recent OECD-wide analysis by Matvejevs and Tkacevs (2023), who find that, across 34 advanced countries, each additional dollar of public investment is associated with about two dollars of private investment in the long run. This suggests a strong complementary relationship, underpinned by productivity-enhancing infrastructure. In line with these findings, a comprehensive cross-country study by the Boston Consulting

Group (2026) confirms that well-planned infrastructure investment substantially boosts growth. Examining 92 countries over three decades, the study reports that a sustained 5% increase in infrastructure stock is associated with an increase in annual GDP growth of up to 0.45 percentage points, with the largest gains observed in developed economies.

In emerging markets and developing economies, the literature similarly points to positive impacts of public infrastructure on private-sector activity and long-term development. A recent World Bank study by Francois et al. (2024), using panel data for 109 developing countries, finds a strong crowding-in effect: on average, each dollar of public investment triggers about 1.6 dollars of additional private investment. This effect is especially pronounced in low-income countries and regions with large infrastructure gaps – such as sub-Saharan Africa – indicating that public capital can alleviate critical bottlenecks and raise the marginal productivity of private investment. The implication is that in capital-constrained environments, public infrastructure provision crowds in private capital by supplying essential complementary inputs – such as transport links, energy or connectivity – that make private projects more viable and profitable.

Studies on Europe and the Western Balkans arrive at similar conclusions. In the European context, infrastructure investment has been identified as a key driver of convergence and private-sector development. Revoltella et al. (2016) show that regions with more developed transport networks are better placed to benefit from positive growth opportunities: improved infrastructure allows firms to connect to global markets and acts as a catalyst for regional economic growth. Notably, this advantage is particularly pronounced during economic downturns, suggesting that strong infrastructure can help regions to recover more quickly from recession. However, Europe's recent slowdown in infrastructure spending, especially since 2008, is seen as worrying for future growth prospects.

Research on the Western Balkans highlights that the region continues to face substantial infrastructure gaps, widely seen as a barrier to private investment and development. Closing these gaps could yield significant economic returns. Holzner and Schwarzhappel (2018) document the Western Balkans' chronic underinvestment in infrastructure and argue that an ambitious investment push is needed to support growth and expand private-sector activity. More recently, Holzner (2026) suggests that public infrastructure investment can serve as a catalyst for economic transformation in the region, helping to modernise economies, crowd in private capital and, ultimately, facilitate convergence with EU income levels.

Overall, the consensus from recent empirical studies – across advanced and emerging economies, Europe, and the Western Balkans – is that public infrastructure investment, when well designed and implemented under the right conditions, is more likely to catalyse private investment than to crowd it out. This makes it a powerful policy tool for addressing persistent investment gaps and supporting long-term development.

Two key mechanisms have been identified to explain these outcomes. On the demand side, public infrastructure spending provides a Keynesian stimulus: it directly increases aggregate demand and, during periods of economic slack, can encourage firms to invest in anticipation of higher future sales. On the supply side, infrastructure investment creates productive public capital – such as transport networks, utilities and digital infrastructure – that raises the productivity and lowers the operating costs of private

firms. For instance, a manufacturer's investment in new equipment becomes more attractive if supported by reliable highways, energy infrastructure or broadband connectivity.

The contribution of our analysis is to revisit these relationships in the context of the Western Balkans, using harmonised sector-level data and a consistent framework for comparison with the EU. In particular, we estimate the extent to which public investment crowds in private investment across six key infrastructure sectors, and whether these effects differ between the Western Balkans and the EU. This sectoral breakdown allows us not only to verify the presence of crowding-in effects in the region, but also to identify where these effects are strongest. This provides a practical basis for prioritising public investment in a fiscally constrained environment, and for designing strategies that maximise the growth and private-investment impact of infrastructure spending in the Western Balkans.

3. A FIRST LOOK AT THE DATA

Following Revoltella et al. (2016) and Holzner and Schwarzhappel (2018), we use Eurostat data on gross fixed capital formation (GFCF) by asset category as a proxy for public infrastructure investment. Specifically, we approximate public infrastructure investment with GFCF in the asset category of 'other buildings and structures' in NACE Rev. 2 sectors D, E, H, J, P and Q – energy, water and waste, transport, information and communication, education, and health. This asset category captures infrastructure-type construction and civil engineering works, while excluding dwellings, machinery and equipment, and intangible assets. Moreover, the six NACE sectors considered are sectors in which buildings and structures are predominantly publicly provided. As illustrated by Revoltella et al. (2016) and Holzner and Schwarzhappel (2018), this approach has become standard for infrastructure-related investment in cross-country comparisons.

This measure of public infrastructure investment is then correlated with private investment. We define private investment using the same Eurostat GFCF dataset and classification: it is total GFCF across all asset categories and all sectors, minus the public infrastructure proxy defined above. Importantly, this private-investment measure still includes investment undertaken in the six NACE Rev. 2 sectors D, E, H, J, P and Q (energy, water and waste, transport, information and communication, education, and health) in all other asset categories. In other words, although 'other buildings and structures' in these sectors are treated as public infrastructure, items such as machinery and equipment (or intellectual property products) in, for example, the health sector are classed as private investment. The analysis covers the period 2000-2024 and includes all countries available in the Eurostat database – i.e. the EU member states plus four Western Balkan economies: Albania, Bosnia and Herzegovina, North Macedonia, and Serbia.

Figure 1 shows total infrastructure-related investment, defined as explained above, for the four Western Balkan economies analysed here, as well as Austria and Germany. Infrastructure investment is broadly similar across all six countries, averaging between about 1.5% and 2% of GDP. On average, the Western Balkan economies are neither systematically above nor below Austria and Germany, and differences within the Western Balkans are also modest. One notable contrast, however, is volatility: infrastructure investment in the Western Balkans fluctuates strongly over time, with pronounced ups and downs, whereas it is very stable in Austria and Germany. Germany exhibits lower levels of investment than Austria, supporting anecdotal evidence that infrastructure conditions are better

in the latter country. Within the Western Balkans, Albania exhibits occasional spikes roughly every three to four years, Bosnia and Herzegovina shows a marked upward trend over the past decade, while North Macedonia and Serbia display more cyclical-looking dynamics.

Figure 1 / Total infrastructure investment in the Western Balkan countries, Austria and Germany (% of GDP)
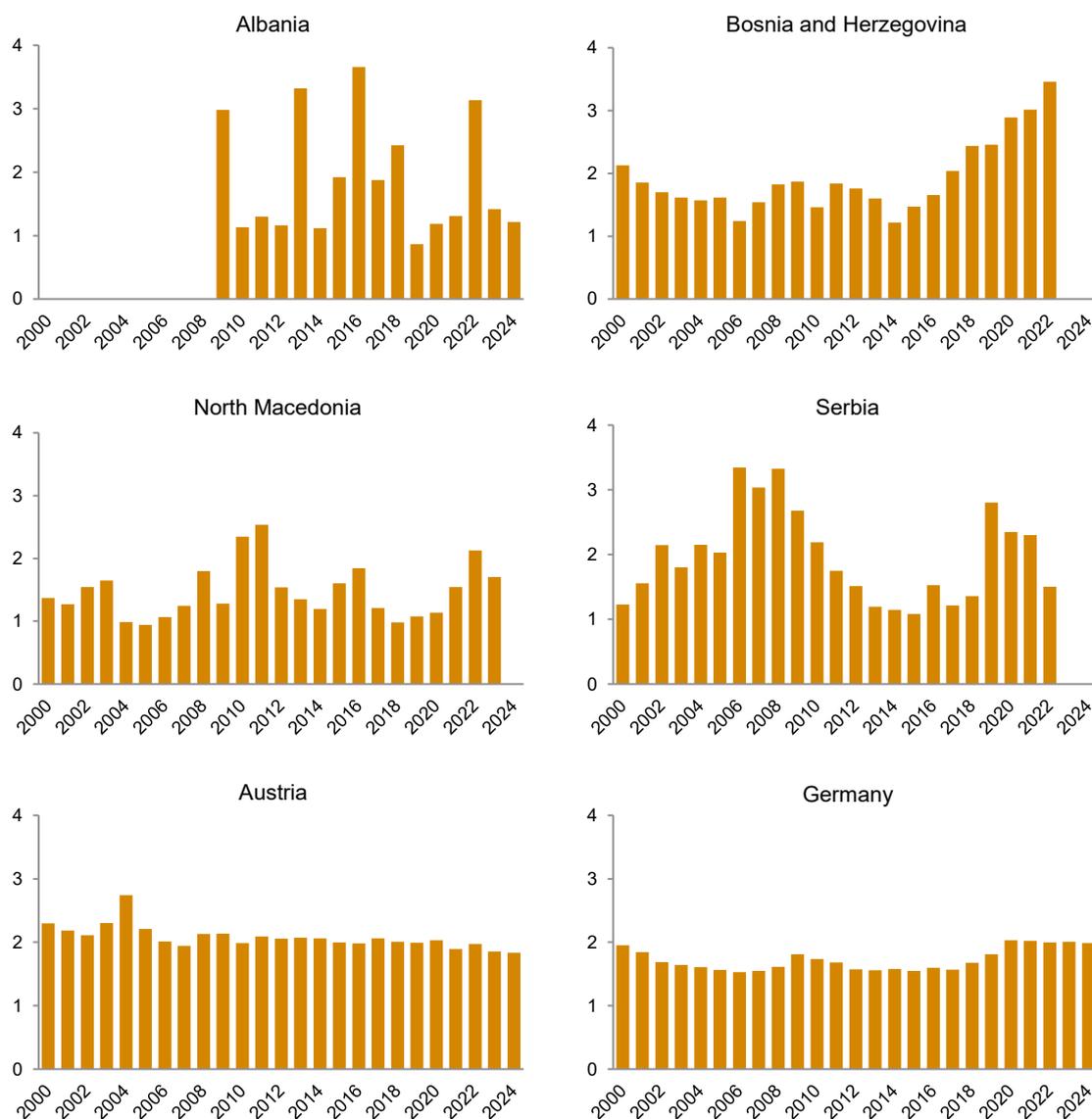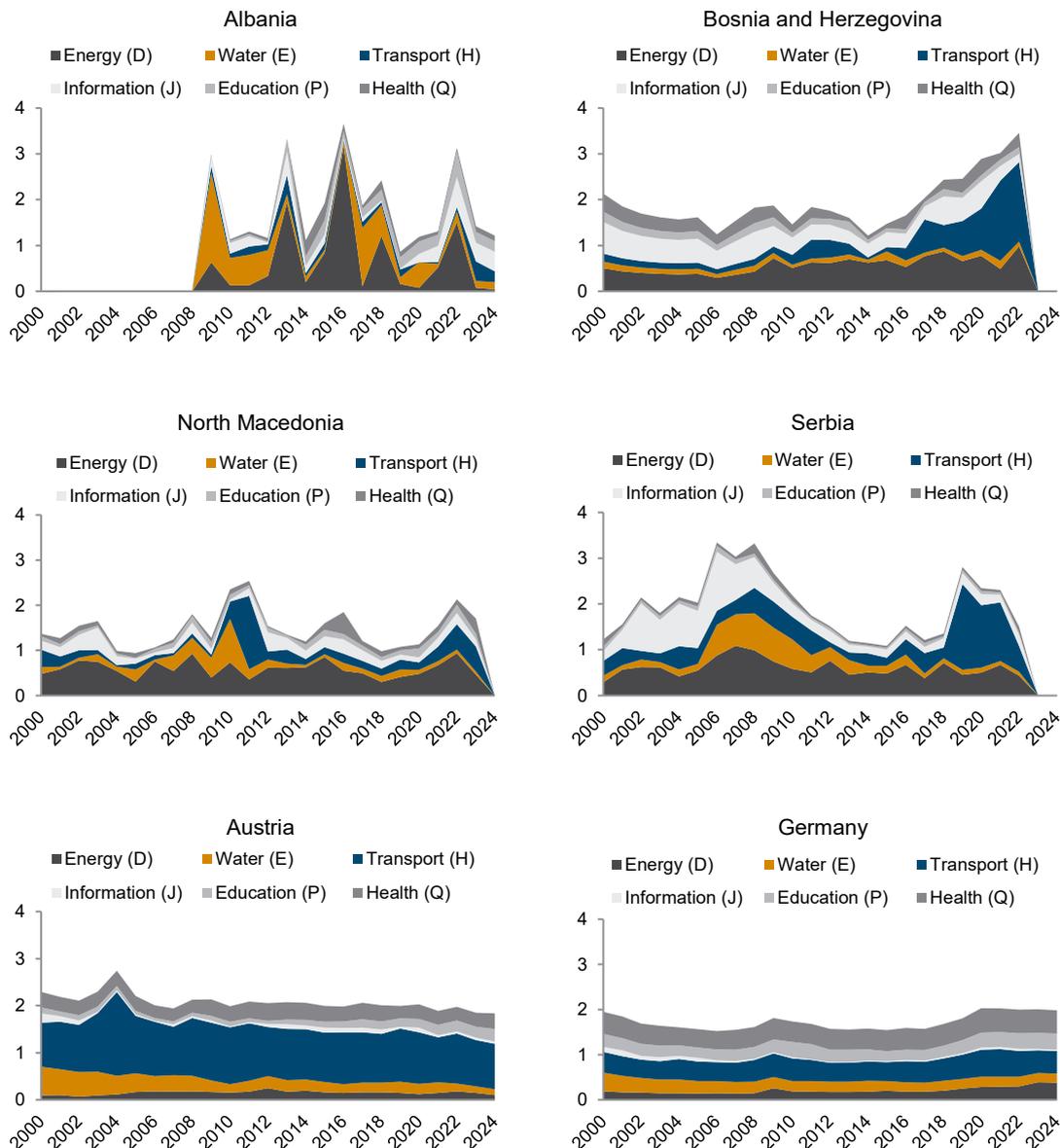

Source: Authors' calculations using Eurostat data.

Figure 2 breaks down infrastructure-related investment by the individual NACE sectors analysed and reveals several clear differences between the Western Balkans and Austria and Germany. First, investment in energy (sector D) is much larger in the Western Balkans. Across the four economies analysed, it is the single biggest sector, averaging around 0.6% of GDP, whereas in Austria and Germany it is far smaller, at about 0.2% of GDP. By contrast, transport (sector H) dominates in Austria and Germany, reaching roughly 0.8% of GDP (with lower levels in Germany than in Austria), while in the

Western Balkans it averages only around 0.3% of GDP. A similar gap appears in health (sector Q): it is the second-largest category in Austria and Germany, at about 0.4% of GDP, but in the Western Balkans it is much smaller, at around 0.1% of GDP. Finally, investment in information and communication (sector J) is stronger in the Western Balkans, averaging about 0.3% of GDP, compared with roughly 0.1% of GDP in Austria and Germany.

Figure 2 / Infrastructure investment by NACE sectors in the Western Balkan countries, Austria and Germany (% of GDP)
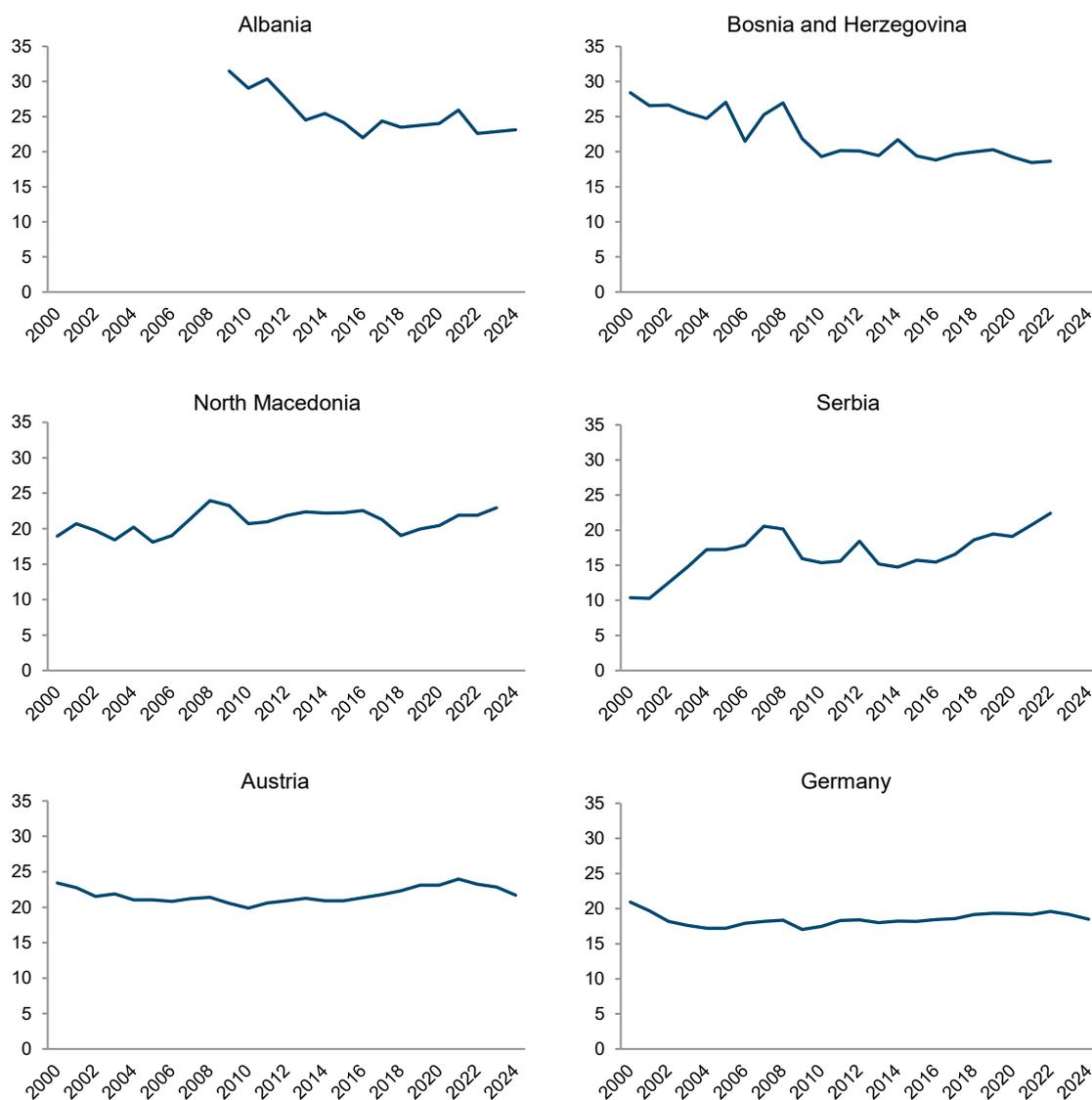

Source: Authors' calculations using Eurostat data.

Figure 3 presents the private investment variable used in the analysis for the Western Balkan economies, Austria, and Germany over the past 25 years. The Western Balkans seem to have slightly higher private investment, especially in more recent years. Also, the trends observed among

different countries diverge somewhat. In Albania, private investment shows a clear downward trend at first, falling from a very high level of over 30% of GDP around 2009, before stabilising at roughly 23-24% over the past decade. Bosnia and Herzegovina displays similar dynamics: private investment declines from just under 30% of GDP in the early 2000s and settles at around 20% in the last 10 years. North Macedonia shows a mild upward trend. Private investment rises from around 20% of GDP in the early 2000s to about 22-23% in recent years, although with occasional fluctuations. Serbia follows a similar upward trajectory, but from a much lower starting point: private investment increases from roughly 10% of GDP in the early 2000s to around 22% in recent years. In Austria, private investment fluctuates in a cyclical manner between about 20% and 25% of GDP, with some slowdown lately. Germany is even more stable, with private investment typically moving within a narrow range of around 17% to 20% of GDP, the lowest level among the six countries shown here.

Figure 3 / Private investment in the Western Balkan countries, Austria and Germany (% of GDP)

Source: Authors' calculations using Eurostat data.

4. ECONOMETRIC ANALYSIS

To examine whether public investment crowds in private investment or crowds it out, we estimate a set of panel regressions in which private investment as defined in Section 3 is regressed on public infrastructure-related investment at the sectoral level. Both public and private investment are expressed in logarithms, allowing the coefficients to be interpreted as elasticities. The analysis uses annual data for the period 2000-2024, which enables it to highlight variation across countries, sectors and time. All specifications include country and year fixed effects to control for time-invariant country characteristics and common shocks, and are estimated using ordinary least squares with robust standard errors.

Table 1 reports the baseline results for the full sample of European countries, covering EU member states and the Western Balkans. Across all sectors, public investment is positively and statistically significantly associated with overall private investment, suggesting crowding in rather than crowding out. The estimated elasticities range from about 0.07 in transport to 0.16 in health. This means that a 1% increase in public investment in a given sector is linked to an increase of between 0.07% and 0.16% in total private investment, depending on the sector. The strongest effects are found in social infrastructure: health shows the largest elasticity (0.16), followed by education (0.14). This pattern suggests that public spending on social infrastructure is particularly effective in encouraging private investment activity.

Table 1 / Relationship between public and private investment: baseline results

(Dependent variable: log of private investment)

Public investment by sector (logs)	Coefficient
Energy (D)	0.088***
	(0.013)
Water and waste (E)	0.092***
	(0.015)
Transport (H)	0.065***
	(0.013)
Information and communication (J)	0.101***
	(0.015)
Education (P)	0.135***
	(0.018)
Health (Q)	0.163***
	(0.018)

Notes: Robust standard errors are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Regression includes country and year fixed effects (not reported). Public investment is proxied by gross fixed capital formation in other buildings and structures in the named sectors. Private investment is total gross fixed capital formation, minus public investment. The sample covers European countries, including EU member states, plus the Western Balkans, over the period 2000-2024. Both dependent and explanatory variables are in log terms, hence coefficients can be interpreted as elasticities.

Table 2 extends the analysis by allowing the effect of public investment to differ between the EU and the Western Balkans, by interacting sectoral public investment with a Western Balkans dummy. The results suggest that, in most sectors, the crowding-in effect in the Western Balkans is not statistically different from that in the EU, pointing to broadly similar transmission channels.
One exception stands out. In the health sector, the interaction term is negative and statistically

significant, indicating that the crowding-in effect of public health infrastructure investment is weaker in the Western Balkans than in the EU, i.e. the baseline case. Importantly, the combined effect (the EU baseline coefficient plus the Western Balkans interaction) remains positive, so higher public investment in health still tends to raise private investment in the Western Balkans – albeit by less than in EU countries.

A plausible explanation for the weaker effect of health spending in the Western Balkans could be limited domestic complementarity. Health investment in the Western Balkans may rely heavily on imported equipment, materials and specialised services, with a relatively small local supplier base and limited domestic health-related manufacturing. As a result, a larger share of the demand generated by public investment 'leaks' abroad, and less of it translates into additional domestic private investment compared with the EU, where stronger local value chains and supporting industries can amplify the crowding-in effect.

Table 2 / Relationship between public and private investment: Western Balkans versus EU

(Dependent variable: log of private investment)

Public investment by sector (logs)	EU baseline effect	Additional effect in the Western Balkans
Energy (D)	0.083***	−0.022
	(0.015)	(0.033)
Water and waste (E)	0.078***	0.019
	(0.016)	(0.034)
Transport (H)	0.072***	0.013
	(0.017)	(0.028)
Information and communication (J)	0.106***	−0.056
	(0.017)	(0.034)
Education (P)	0.141***	−0.049
	(0.018)	(0.048)
Health (Q)	0.178***	−0.116***
	(0.020)	(0.042)

Notes: Robust standard errors are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Regression includes country and year fixed effects (not reported). Public investment is proxied by gross fixed capital formation in other buildings and structures in the named sectors. Private investment is total gross fixed capital formation, minus public investment. The sample covers European countries, including EU member states, plus the Western Balkans, over the period 2000-2024. 'EU baseline effect' refers to the estimated baseline coefficient for EU countries, while 'Additional effect in the Western Balkans' captures the difference relative to the EU through interaction terms. The net effect for the Western Balkans is given by the sum of the two coefficients. Both dependent and explanatory variables are in log terms, hence coefficients can be interpreted as elasticities.

Next, we run further regressions to assess the robustness of the results. First, we replace the contemporaneous public-investment variables with their first lags. Table 3 reports these estimates for the specification that does not distinguish between the EU and the Western Balkans. The results are virtually unchanged from the original estimates with contemporaneous variables shown in Table 1. All coefficients remain positive and statistically significant at the 1% level, and their magnitudes are very similar. This is not surprising, given that sectoral public investment does not fluctuate strongly over time – especially in the EU, as shown in the previous section.

Table 3 / Relationship between public and private investment: results with first lag of public investment

(Dependent variable: log of private investment)

Lagged public investment by sector (logs)	Coefficient
Energy (D)	0.087***
	(0.015)
Water and waste (E)	0.078***
	(0.016)
Transport (H)	0.053***
	(0.014)
Information and communication (J)	0.085***
	(0.017)
Education (P)	0.154***
	(0.018)
Health (Q)	0.136***
	(0.018)

Notes: Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Regression includes country and year fixed effects (not reported). Public investment is proxied by gross fixed capital formation in other buildings and structures in the named sectors. All public investment variables are included with the first lag. Private investment is total gross fixed capital formation, minus public investment. The sample covers European countries, including EU member states, plus the Western Balkans, over the period 2000-2024. Both dependent and explanatory variables are in log terms, hence coefficients can be interpreted as elasticities.

Table 4 / Relationship between public and private investment: Western Balkans versus EU, specification with first lags

(Dependent variable: log of private investment)

Lagged public investment by sector (logs)	EU baseline effect	Additional effect in the Western Balkans
Energy (D)	0.084***	−0.020
	(0.016)	(0.049)
Water and waste (E)	0.065***	0.032
	(0.017)	(0.033)
Transport (H)	0.048***	0.043
	(0.017)	(0.030)
Information and communication (J)	0.087***	−0.040
	(0.019)	(0.039)
Education (P)	0.159***	−0.037
	(0.017)	(0.058)
Health (Q)	0.160***	−0.161***
	(0.018)	(0.048)

Notes: Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Regression includes country and year fixed effects (not reported). Public investment is proxied by gross fixed capital formation in other buildings and structures in the named sectors. All public investment variables are included with the first lag. Private investment is total gross fixed capital formation, minus public investment. The sample covers European countries, including EU member states, plus the Western Balkans, over the period 2000-2024. 'EU baseline effect' refers to the estimated coefficient for EU countries, while 'Additional effect in the Western Balkans' captures the difference relative to the EU through interaction terms. The net effect for the Western Balkans is given by the sum of the two coefficients. Both dependent and explanatory variables are in log terms, hence coefficients can be interpreted as elasticities.

Table 4 reports the results using first lags of public investment in the specification with interaction terms for the Western Balkans. Overall, the findings remain very close to those obtained with contemporaneous variables (Table 2). The main difference concerns the additional Western Balkan effect in the health sector: the interaction term is again negative and highly significant, but somewhat larger in magnitude (-0.161 compared with -0.116). As a consequence, the sum of the baseline health coefficient and the Western Balkan interaction term is close to zero, suggesting that lagged public investment in health infrastructure does not crowd in private investment in the Western Balkans. For all other sectors, the results are essentially unchanged, implying that public infrastructure investment continues to be associated with higher private investment.

We also estimate specifications that include both the contemporaneous value of public investment and its first lag. The findings remain in line with the earlier results: public investment is generally associated with higher private investment, with broadly similar effects in the EU and the Western Balkans. The main exception is again the health sector, where the estimated overall effect in the Western Balkans is substantially smaller and close to zero.

Finally, we repeat the exercise using second lags. Again, the results are very similar: we again find no evidence of crowding in for health investment in the Western Balkans, whereas crowding-in effects remain present in the other sectors.

5. SUMMARY AND POLICY IMPLICATIONS

This note analyses the effects of public infrastructure-related investment on private investment in the Western Balkans and compares the results with the EU. Several **key findings** emerge.

Public infrastructure investment in the Western Balkans crowds in private investment overall. Across the six infrastructure sectors analysed – energy, water and waste, transport, information and communication, education, and health – higher public investment is associated with higher private investment, providing clear evidence against crowding-out concerns.

The estimated effects in the Western Balkans are broadly in line with those observed in the EU, suggesting that the basic mechanisms through which public investment stimulates private activity operate in much the same way in the region as in the EU. The main difference concerns health investment. Although public investment in health infrastructure strongly crowds in private investment in the EU, the effect in the Western Balkans is significantly smaller.

There are clear differences in the strength of crowding-in effects across sectors. In the Western Balkans, the largest effects are found in education, followed by information and communication, while energy, water and waste, and transport show more moderate effects. Health ranks last in terms of crowding-in strength. The ranking differs in the EU, where health investment exhibits the strongest crowding-in effect, and the other sectors follow in the same order as in the Western Balkans.

A plausible explanation for the weaker impact of health infrastructure spending in the Western Balkans is a lower level of domestic complementarity. Much of the equipment, technology and specialised inputs associated with health investment is imported, and domestic health-related

manufacturing and supplier networks remain limited. As a result, a larger share of the induced private investment leaks abroad rather than materialising domestically.

These findings have several implications for public investment policy in the Western Balkans. First, they provide strong support for scaling up public investment in general. Public investment is essential for the provision of public goods, improvements in quality of life, and the strengthening of long-term growth and productivity. The results indicate that it also helps to mobilise private investment, reinforcing its macroeconomic and structural benefits.

Second, the composition of public investment matters. Where fiscal space is constrained, prioritisation should favour education and information and communication infrastructure, which show particularly strong crowding-in effects and therefore warrant a more prominent role in investment strategies. These sectors are closely linked to human capital formation, innovation and productivity growth, and appear to generate relatively high private-investment multipliers.

Third, the results raise questions about the current sectoral composition of public investment in the Western Balkans. A large share of public investment in recent years has been directed towards energy, yet the estimated crowding-in effects in this sector are comparatively modest. This does not imply that energy investment is unimportant – especially given the green transition – but it suggests that, from the perspective of mobilising private domestic investment, returns may be lower than in other sectors unless complemented by reforms that strengthen linkages to domestic firms and supply chains.

Fourth, the weaker crowding-in effect of health investment points to a more specific policy challenge. To maximise the domestic benefits of public health infrastructure spending, Western Balkan countries should focus on building health-related capabilities at home. This includes strengthening education and skills in relevant fields, supporting investment in medical equipment and life sciences, fostering co-operation between universities, research centres, firms and governments, and expanding participation in European research and innovation networks. Greater integration with EU research ecosystems – including scientific exchanges and collaboration with countries such as Austria, where strong health and life-science clusters exist – could help to build domestic complementarities and strengthen the private-investment response to public health spending.

Finally, it is important to note that the results should not be interpreted as implying that simply increasing the volume of public investment will automatically maximise its economic impact. Research on public investment management in the EU emphasises that well-planned infrastructure investment can substantially boost economic growth and mobilise private capital. In particular, studies of public investment practices across EU member states highlight the importance of the early stages of the investment cycle – strategic planning, project selection and budgeting – for ensuring that investment projects are economically justified, credibly prioritised and realistically financed (Belu Manescu, 2021; 2022; 2024). These insights are relevant for the Western Balkans as well. If public investment is to crowd in private capital more effectively, private firms must be able to treat public infrastructure projects as credible signals of future development rather than uncertain political commitments. Strengthening the institutions and procedures governing strategic planning, project selection and budgeting would therefore not only improve the efficiency of public spending itself, but could also increase the willingness of firms to undertake complementary private investment.

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