Reviving and Reorienting Growth after the Pandemic: The Role of Local Infrastructure Investments

by Nicola Bilotta and Alberto Pozzolo

IAI

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Introduction

The last decade has witnessed a progressive change in what had long been considered global priorities for achieving growth. The global financial crisis of 2007–2008 and the following European sovereign debt crises of 2011–2012 have brought to light important pitfalls in the functioning of globalized financial markets. Trade and financial liberalization policies have at times caused severe strains in some communities, raising concerns over the effects of rapid increases in international integration. Environmental and social risks have come to the forefront of the policy debate. The COVID-19 pandemic has brought enormous challenges to what was the normal way of living.

All these events have had far-reaching consequences on the global economy. Currently, the world is facing at least three major shocks that are affecting health (COVID-19), prosperity (the recession) and the planet (climate change). These have been chosen as the three keywords for Italy's G20 Presidency.

These shocks are different in nature and have very diverse effects across countries, regions and municipalities. This calls for differentiated and targeted responses that take into account the specific needs of individual communities.

In the short run, the reaction to exogenous shocks is typically the object of macroeconomic monetary and fiscal policies, as in the case of the global financial crisis and the COVID-19 pandemic. But adequate public infrastructure, including social infrastructure such as schools and hospitals, is also crucial in combating the negative effects of external shocks. In addition, investments to build or renew public infrastructure can provide a vital stimulus for economic recovery.

According to the *Global Infrastructure Outlook*, a G20 initiative, the gap between current trends and needed infrastructure investment in the coming 20 years amounts to 15 trillion US dollars, 0.55 per cent of world gross domestic product (GDP).[1] But this aggregate figure hides large differences across countries: the estimated gap ranges from 2.32 per cent in Brazil and 2.22 per cent in Russia,

1 See the global forecast tool available at https://outlook.gihub.org.

to 0.67 per cent in the United States and 0.33 per cent in China, and to 0.14 per cent in Indonesia and 0.01 per cent in France. Despite these large gaps, the funds available for investments in infrastructure have remained broadly stable for the last decade, at about 3 per cent of GDP. But the aggregate figure hides large differences. In China, investments in infrastructure between 2007 and 2018 were on average 8.2 per cent of GDP, while in Germany and Mexico they were just 1.3 per cent of GDP.

While COVID-19 pandemic recovery policies are putting much emphasis on investment in infrastructure, their importance had already been forcefully emphasized by the G20 in past years.

In 2017, during the German Presidency, the multilateral development banks (MDBs) provided an important contribution to the G20 with their work on how to boost investment in infrastructure, mobilizing and catalysing private capital.[2]

In 2018, during the Argentinian Presidency, the need to attract private capital for infrastructure investments was also emphasized, and a "Roadmap to Infrastructure as an Asset Class" was proposed, discussing how to make infrastructure attractive to private institutional investors.[3]

During the Japanese Presidency, in 2019, the theme of infrastructure investment was even more at the centre of the debate. In particular, the G20 endorsed the "Principles for Quality Infrastructure Investment",[4] with the aim of

> maximizing the positive impact of infrastructure to achieve sustainable growth and development while preserving the sustainability of public finances, raising economic efficiency in view of life-cycle cost, integrating environmental and social considerations, including women's economic empowerment, building resilience against

2 See the *G20 Hamburg Action Plan*, 8 July 2017, http://www.g20.utoronto.ca/2017/2017-g20-hamburg-action-plan.html.

3 G20, *Roadmap to Infrastructure as an Asset Class*, 2018, http://www.g20.utoronto.ca/2018/roadmap_to_infrastructure_as_an_asset_class.pdf. The Argentinian Presidency also emphasized the importance of improving the investment environment: see G20, *Principles for the Infrastructure Project Phase*, 2018, http://www.g20.utoronto.ca/2018/principles_for_infrastructure_project_preparation.pdf.

4 G20, *Principles for Quality Infrastructure Investment*, 2019, https://www.mof.go.jp/english/international_policy/convention/g20/annex6_1.pdf.

natural disasters and other risks, and strengthening infrastructure governance.[5]

Finally, in 2020, the Presidency of Saudi Arabia emphasized the role of infrastructure technology (or InfraTech), the integration of material, machine and digital technologies across the infrastructure life cycle.[6]

Building on this work, the Italian presidency is focusing on the role of investments in local infrastructures. Accordingly, this paper analyses the challenges posed by those investments that focus on the needs of local communities, and proposes some solutions, based on selected best-practices.

As stated by the United Nations within the list of Sustainable Development Goals (SDGs), functioning and resilient infrastructure is the foundation of every successful community, and a prerequisite to achieve fair and sustainable long-term growth.[7] This requires focusing not only on aggregate needs at the national level, but also on how these are satisfied across regions and municipalities. Specifically, SDG Goal 11 is aimed at providing adequate and affordable housing, transport systems, and green and public spaces. It also calls on the need to increase resilience to disasters and reduce the per capita environmental impact of cities; favour national and regional development planning aimed at strengthening the links between urban, suburban and rural areas; and preserve cultural heritage and natural features.[8]

It is forcefully emphasized by the G20 *Global Infrastructure Outlook* that developing economies through infrastructure investment can change the lives of citizens and business prospects as, for example, roads are built, reliable electricity is installed and clean water is made available to all. In more mature economies, investment in infrastructure plays a key role in fostering economic growth, for example through accelerating the digital transformation made

5 G20, *G20 Osaka Leaders' Declaration*, 29 June 2019, http://www.g20.utoronto.ca/2019/2019-g20-osaka-leaders-declaration.html.

6 See the *G20 Riyadh InfraTech Agenda*, July 2020, https://www.gihub.org/resources/publications/g20-riyadh-infratech-agenda.

7 UN General Assembly, *Transforming Our World: The 2030 Agenda for Sustainable Development* (A/RES/70/1), 25 September 2015, https://undocs.org/A/RES/70/1.

8 In addition, Goal 3 for health services, Goal 4 for schooling, Goal 6 for water and Goal 7 for energy all require infrastructure investments.

possible by artificial intelligence and machine learning.

Investing in infrastructure can provide an important stimulus for economic growth: it is estimated that a 1 per cent GDP increase in public investment in advanced economies and emerging markets has the potential to increase GDP in the long run by 2.7 per cent, to generate a surge in private investment of about 10 per cent and to create between 20 and 33 million jobs, directly and indirectly.[9]

A key feature of most infrastructure is that it is physically linked to a given geographical area. For this reason, it is crucial to consider the impact on local communities when designing infrastructure investment policies, together with the need to allow each area and region to attain its economic and social potential. This is even more true in the context of the COVID-19 pandemic, the effects of which are turning out to be much more severe for the weakest countries, communities and citizens.

To recover from the current crisis, governments must move away from the measures that protect households and firms from the short-term impact of COVID-19 to policies with longer term development goals. These include actions that will foster long-term economic growth and those that address problems posed by climate change and by economic and social inequalities.

The COVID-19 pandemic will, to some extent, have permanent structural effects on our way of living, and this is creating huge uncertainty, more so than during previous shocks. However, it is also revealing new opportunities, forcing us to be less entrenched in our old habits and more open to innovations, which ultimately might help to create a better society. In this context, investment in local infrastructure is decisive, as it can address both the short-term need to sustain the recovery and the long-term objective of sustainable growth.

In a hypothetical perfectly functioning market economy, individuals and firms would rationally adapt their behaviour to the new environment. However,

9 The simulations in the appendix to chapter two of the April 2020 issue of the International Monetary Fund's *Fiscal Monitor* (https://www.imf.org/en/Publications/FM/Issues/2020/04/06/fiscal-monitor-april-2020) calculate the long-run effect over a 20-year period.

private markets' reallocation of resources will hardly be adequate in a condition of high uncertainty about the future direction of the economy and in a situation in which new externalities are emerging, because of the pandemic. The contagion is inevitably restricting private choices and makes necessary the definition of collective requirements, such as preserving social distancing in commercial and cultural activities and strengthening local health services to monitor the spread of the disease. Understanding the externalities to be addressed is a crucial step towards defining an optimal local development strategy.

Renovation of existing infrastructure, investment in new projects and long-term management and maintenance require significant financial resources, both public and private. Given the exceptional strain on public finances generated by the recent crises, the participation of the private sector is necessary. But achieving this objective is difficult as local authorities are usually less able to attract private investors than national authorities.

What private investors look for is a rigorous strategy and design process, and clarity on the role of the various stakeholders involved in a project's construction, management and maintenance, with a long-term horizon and a clear view on how a specific investment relates to other initiatives in neighbouring areas or at national level. In the absence of this information, private investors might find it excessively risky to undertake a project or to become part of a public–private partnership (PPP).

In identifying the optimal governance and funding structure for a local investment project, it is important to strike the right balance between national and supranational policies, local and regional development policies, and between public and private financing.

This paper aims to discuss some aspects of local infrastructure investment. It is organized as follows. Section 1 presents data on existing infrastructure gaps. Section 2 provides broad examples of local infrastructure investment that are of particular interest in the current circumstances. Sections 3 and 4 discuss the core issue of the institutional and governance arrangements required to attract investment in local infrastructure. Section 5 describes some specific experiences of local infrastructure investment. The last Section concludes the

paper by proposing a set of policy principles that in our view need to be at the centre of any effective policy for local infrastructure investment.

1. The existing infrastructure gap

1.1 The general picture

The lack of infrastructure worldwide is well known. Before the COVID-19 pandemic, *Global Infrastructure Outlook* estimated a need for infrastructure investment of 94 trillion US dollars by 2040, which at that stage amounted to an increase of 0.5 per cent of world GDP relative to what would be delivered under normal trends.[10]

This picture hides substantial differences across sectors and countries. For example, in the United States, total roads per capita amount to 20 metres, 13 of which are paved; in the Democratic Republic of Congo there are 1.5 metres, only 3 centimetres of which are paved. Moreover, while in advanced economies the challenge is the ageing and lack of resilience of much infrastructure, in emerging economies it is the low level of existing infrastructure.

Infrastructure is lacking to different degrees depending on the sector. According to the Global Infrastructure Outlook, transport and electricity are the two sectors that show the largest gap between planned investments and needs, each accounting for about one-third of the gap.[11] Although the gap in these sectors was estimated to be larger in developing countries, in the United States and in Europe the spending need for road infrastructure between 2016 and 2040 was estimated to be, respectively, around 1.2 per cent and 0.8 per cent of GDP, largely owing to maintenance costs. These gaps contrast with the smaller figures estimated for rail (about 0.1 per cent and 0.3 per cent of GDP in

10 Oxford Economics and Global Infrastructure Hub, *Global Infrastructure Outlook*, July 2017, p. 3, https://cdn.gihub.org/outlook/live/methodology/Global+Infrastructure+Outlook+-+July+2017.pdf.

11 Several methodologies and attempts to provide estimates for global infrastructure investment needs have been tried. Calculating the infrastructure gap is an extremely complicated exercise, owing to major uncertainties in the process. However, it is important to develop a standardized and agreed methodology to define infrastructure needs, as estimates orient and influence the identification of investment priorities.

the United States and in Europe, respectively) and telecommunications (about 0.1 per cent and 0.3 per cent). The gap with respect to planned investment is also significant in the case of ports and airports, but their impact on total investment needs is quite low, as they are a smaller proportion of total value of existing infrastructure. Clearly, when these data are interpreted in light of the COVID-19 pandemic, the questions whether and how the demand for transport infrastructure will change, possibly being replaced by stronger demand for telecommunication infrastructure, are still open.

With respect to the distribution of infrastructure investment across countries, Global Infrastructure Outlook estimates suggest that the largest share of planned investments will be in Asia, which will account for more than half of total spending. America and Europe will have smaller shares, around 20 per cent and 25 per cent respectively, while the share for Africa and Oceania will be negligible. The gap between planned and needed investments is largest in America (47 per cent), mostly owing to lack of existing infrastructure and low planned investment in Latin America and in Africa (39 per cent). Remarkably, the large share of investment in Asia will make up most of the estimated needs.

The large variation across countries in the stock of existing infrastructure, and in the gap between trends in investment and investment needs, hides stark differences between regions, and between municipalities within the same country. Metropolitan areas typically have much better infrastructure than suburban and rural areas. Within Organisation for Economic Co-operation and Development (OECD) countries, about 87 per cent of residents in central and densely populated neighbourhoods have access to hospitals within a 30-minute drive, compared with only 57 per cent of residents of urban areas that are less central.[12] In less developed countries, access to basic infrastructures and services, such as good roads, reliable electricity and hospital care, is not even available to all residents in urban areas. In rural contexts, the situation is even more challenging, and this affects the accumulation of human capital, poverty reduction and long-term growth. In such contexts, local investment in infrastructure can make a radical difference to the standard of living of entire regions.

12 Organisation for Economic Co-operation and Development (OECD), *OECD Regions and Cities at a Glance 2018*, Paris, OECD Publishing, 2018, p. 10, https://doi.org/10.1787/reg_cit_glance-2018-en.

The uneven access to infrastructure mirrors regional differences in income levels. In 2016, across most OECD countries, the top 10 per cent of regions in a given country recorded an average GDP per capita more than twice that of the bottom 10 per cent of regions in the same country. These differences are self-perpetuating, as the richer regions typically raise a larger amount of both public and private investment in local infrastructure. In turn, these regions provide higher quality health and school services, hence strengthening human capital formation and offering better business services, with the result that average total factor productivity and GDP increase. Many forces favour investment concentration in richer and more developed areas.[13] However, this does not necessarily correlate with the optimal allocation of resources: it can be the outcome of historical events, whose cumulative effects are path dependent.[14] Public policy interventions are thus critical in addressing asymmetries and market failures, and in allowing each region to attain its potential, thus achieving fairer income distribution.

In many countries, increased specialization and better access to services and to economic and social opportunities foster internal migration from rural to urban areas. The share of the world's population living in urban areas has increased from 30 per cent in 1950 to 55 per cent in 2018, and it is predicted to increase to 60 per cent by 2030. In terms of GDP, urban areas have an even larger share, implying that per capita GDP is higher in cities than in rural areas.[15] North America and Latin America are the world's most urbanized regions, with more than 80 per cent of their population living in urban areas, as opposed to 50 per cent in Asia and 45 per cent in Africa. Within G20 nations, this share ranges from 34 per cent in India to 91.9 per cent in Argentina. Interestingly, the

13 Paul Krugman, "Increasing Returns and Economic Geography", in *Journal of Political Economy*, Vol. 99, No. 3 (June 1991), p. 483-499.

14 See Andy Pike, Andrés Rodríguez-Pose and John Tomaney (eds), *Local and Regional Development*, 2nd ed., London, Routledge, 2016. The typical example of path dependency in the economic literature is the QWERTY order of the letters on Western keyboards, which reflects the optimal structure of mechanical typewriters, yet nonetheless has not been changed with the diffusion of computers. Similar path-dependent equilibria have been described in many cases, such as the location of cities or the development of industries. See Paul A. David, "Clio and the Economics of QWERTY", in *The American Economic Review*, Vol. 75, No. 2 (May 1985), p. 332-337.

15 UN Department of Economic and Social Affairs (UNDESA), *World Urbanization Prospects 2018. Highlights*, New York, United Nations, 2019, p. 5, https://population.un.org/wup/Publications/Files/WUP2018-Highlights.pdf.

world's fastest growing cities are in Asia and in Africa: in 2018, 33 megacities hosted 13 per cent of the global urban population; of these, 23 were in a G20 nation and 20 were in Asia.

Large cities are far from homogeneous in terms of infrastructure availability, showing stark differences across neighbourhoods. The COVID-19 pandemic has revealed how these imbalances can affect the spread and impact of contagious diseases. In addition, accelerating climate gentrification trends – with higher income and better-informed households acquiring property in areas with housing and infrastructure facing lower climate-related risk or better adapted to it – are likely to determine similar impact imbalances in the aftermath of climate-related shocks. Addressing the unequal availability of infrastructure and related services is a critical step in allowing all citizens to attain their economic and social potential and to reduce inequalities in the exposure of different population groups to critical risk. In some countries, rapid trends in urbanization require active policies to guarantee access to basic services by households and industries. Differences in the availability of infrastructure is also stark within cities, calling for local investment policies to focus on the needs of specific neighbourhoods.

1.2 The consequences of the COVID-19 pandemic

The COVID-19 pandemic is having a strong impact across and within countries, in part by accelerating existing processes, in part by reversing them and in part by adding new challenges. The crisis is hitting all countries almost simultaneously, but its impact is asymmetric across countries, regions, sectors and citizens. Over 90 per cent of COVID-19 contagions are occurring in urban areas, with higher risks in densely populated informal settlements and slums. The World Bank estimates that "the COVID-19 pandemic is likely to push between 88 and 115 million people into extreme poverty in 2020, setting back poverty reduction by around three years".[16] Workers in commerce, tourism,

16 Christoph Lakner et al., "Updated Estimates of the Impact of COVID-19 on Global Poverty: The Effect of New Data", in *World Bank Data Blog*, 7 October 2020, https://blogs.worldbank.org/node/47536. See also Christoph Lakner et al., "Updated Estimates of the Impact of COVID-19 on Global Poverty: Looking Back at 2020 and the Outlook for 2021", in *World Bank Data Blog*, 11 January 2021, https://blogs.worldbank.org/node/51626.

health and personal care are often less skilled and paid less than average, and are either facing higher risks of contagion or are being forced into inactivity.

Recent health policy decisions around the world show that there is a trade-off between containment of the virus and the economic impact of lockdowns. Countries have managed such trade-offs differently, and this has played its own part in making the impact of the pandemic even more diverse.

A comprehensive understanding of what is causing the asymmetric impact of the pandemic is still to come, but much is explained by differences in access to economic and social infrastructures. As argued by Bhardwaj et al., wealthier people in dense neighbourhoods can isolate themselves and have goods and services delivered, while residents of poor and overcrowded neighbourhoods cannot.[17] Differences are also considerable across nations: the percentage of overcrowded houses is 0.7 in Canada against 33.9 in Mexico.[18] People are living in much closer contact in cities in developing countries than in those of OECD countries. In Dar-es-Salaam, 28 per cent of residents live at least three to a room; in Abidjan, nearly 50 per cent. This could also be a concern in developed countries where housing poverty in some urban areas is remarkable. Satisfactory housing infrastructure is therefore vital when facing a contagious disease.

Other factors determining the spread of COVID-19 include the availability of specialized health services and infrastructure, and the number of social contacts required by local economic activities, which is obviously high in areas that specialize in retail trade, tourism and cultural events. However, as time passes, the ability to reorganize our day-to-day life – which is itself related to the availability of economic and social infrastructures – is proving a key element of resilience and recovery.

17 Gaurav Bhardwaj et al., Cities, *Crowding, and the Coronavirus: Predicting Contagion Risk Hotspots*, Washington, World Bank, 2020, p. 2, http://hdl.handle.net/10986/33648.

18 See OECD, *Housing Overcrowding (Indicator)*, 2021, https://doi.org/10.1787/96953cb4-en. A household is considered as living in overcrowded conditions if less than one room is available for each couple in the household; for each single person aged 18 or more; for each pair of people of the same gender between 12 and 17; for each single person between 12 and 17 not included in the previous category; and for each pair of children under the age of 12. Rooms refer to bedrooms, living and dining rooms and, in non-European countries, kitchens.

Policymakers are thus required to reassess the infrastructure needs of cities and different areas thereof, as well as the delivery of essential services, such as schooling, in large spaces to allow increased social distancing. Moreover, if movements away from major urban areas are to become a significant and structural process, as data on real estate sales are suggesting, policymakers will need to rethink and upgrade transportation and telecommunication networks, as well as other infrastructure and services in smaller urban areas that may be affected by an increase in population (e.g. water and wastewater systems). It is critical that economic and social infrastructure should become more uniformly available across communities.

The time horizon of the impact of the COVID-19 pandemic and of related new needs must be carefully considered. The pandemic is having huge effects, but many of them may be transitory: economic growth will probably rebound after the peak of the crisis and stabilize around its long-run trend; the uneven impact on income distribution caused by the spreading of the disease will eventually diminish; while communities that have been most severely hit will hopefully recover. However, the pandemic is also causing longer lasting effects that may produce a permanent shift in the organization of societies. Some of these changes have an overall negative impact on the well-being of the population and require mitigation policies, but other changes may have a positive long-term effect and therefore need to be supported. Prominent examples are the digitalization of public administration and public services delivery and the diffusion of home-based work, which will potentially reduce commuting costs and have positive effects on companies' balance sheets.[19] Disentangling temporary from permanent effects and, among the latter, positive from negative outcomes, is a crucial step towards driving future policy decisions, as is the importance of systemically identifying the potential synergies and trade-

19 See UNDESA, "COVID-19: Embracing Digital Government during the Pandemic and Beyond", in *UN/DESA Policy Briefs*, No. 61 (14 April 2020), https://www.un.org/development/desa/dpad/publication/un-desa-policy-brief-61-covid-19-embracing-digital-government-during-the-pandemic-and-beyond. These effects may nonetheless be limited to some type of workers: the World Bank estimates that, globally, one in every five jobs can be done from home, but the figure drops to only one in every 26 in low-income countries. See Daniel Garrote Sanchez et al., "Who on Earth Can Work from Home?", in *World Bank Policy Research Working Papers*, No. 9347 (July 2020), http://hdl.handle.net/10986/34277. In addition, opposite effects should also be considered: for example, the reduction in revenues caused by the drop in the number of commuters may reduce the funds available for the maintenance of existing transport infrastructures.

offs of such decisions across different sectors.

The recent survey conducted by the OECD and the European Committee of the Regions shows that larger municipalities, regions and inter-municipal cooperation bodies (IMC) expect the COVID-19 pandemic to have a disproportionally stronger impact (Figure 1) More populated municipalities are also expected to suffer more from the pandemic (Figure 2).[20]

Figure 1 | Impact of COVID-19 on subnational governments, by subnational government type

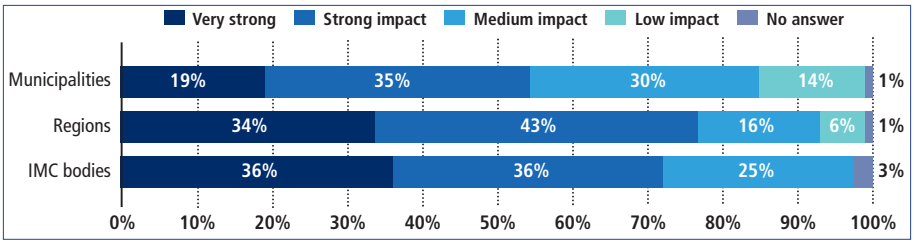
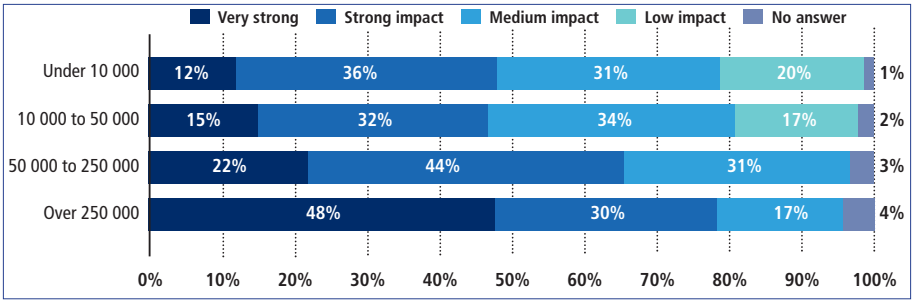


Figure 2 | Impact of COVID-19 on subnational governments, by population



Source: OECD, "The Impact of the COVID-19 Crisis on Regional and Local Governments", cit., p. 9.

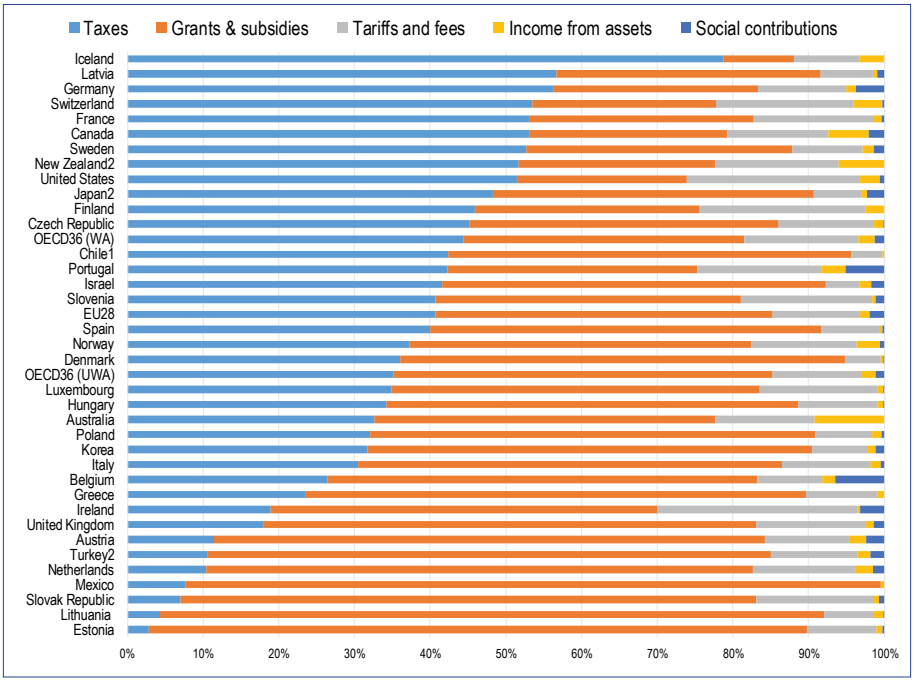
The COVID-19 pandemic is also having a heterogeneous impact on subnational public finances. According to a recent publication by the OECD, nearly all subnational governments expect a rise in expenditure and a fall in revenue in the

20 OECD, "The Impact of the COVID-19 Crisis on Regional and Local Governments: Main Findings from the Joint CoR-OECD Survey", in *OECD Development Papers*, November 2021, https://doi.org/10.1787/fb952497-en.

short and medium term. At least three main factors determine a differentiated fiscal impact of the pandemic on regions and municipalities: the degree of decentralization in spending and revenue responsibility, and the scope and efficiency of economic support from central government; the sensitivity of local tax revenues and public expenditures to economic fluctuations owing to unexpected shocks; and the initial conditions of local public finances and the impact of the shock on the existing stock of public financial assets and liabilities.

The sources of revenues of local governments across countries are heterogeneous, although taxes and grants typically have the largest share (see Figure 3 for a sample of G20 countries).

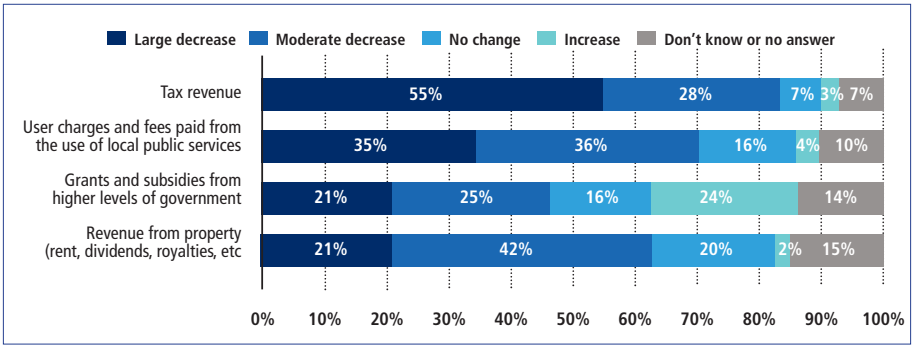
Figure 3 | Local government revenues by source



Source: OECD, "The Territorial Impact of COVID-19: Managing the Crisis across Levels of Government", in *OECD Policy Responses to Coronavirus (COVID-19)*, updated 10 November 2021, p. 26, http://www.oecd.org/coronavirus/policy-responses/the-territorial-impact-of-covid-19-managing-the-crisis-across-levels-of-government-d3e314e1.

In addition, according to the survey by OECD and the European Committee of the Regions previously mentioned, most municipalities expect a large reduction in revenues from taxes and fees (Figure 4).

Figure 4 | Impact on subnational revenues, by revenue source



Source: OECD, "The Impact of the COVID-19 Crisis on Regional and Local Governments", cit., p. 19.

This calls for active local finance policies. The OECD report previously mentioned, suggests four main lines of action: revenue measures, including central government grants and subsidies; expenditure measures, such as easing spending responsibilities and – for some of them – temporary transfer to central government; measures to facilitate budget management, such as the introduction of multi-annual budgeting; and the relaxation of spending rules, especially on investment expenditure.[21] A further line of action is to improve strategic financial management, so as to achieve a better match between the cost of finance and the specific features of each investment. For example, grants should not be used to finance potentially revenue-generating investments, but rather to address market failures where investment decisions would otherwise be suboptimal, such as in climate adaptation actions.

All in all, many lessons can be learnt from current experience about what makes countries, regions and cities weaker or stronger when they are hit by an exogenous shock. Successful practices in containing the pandemic and its impact may also prove useful in increasing system resilience to the next crisis.

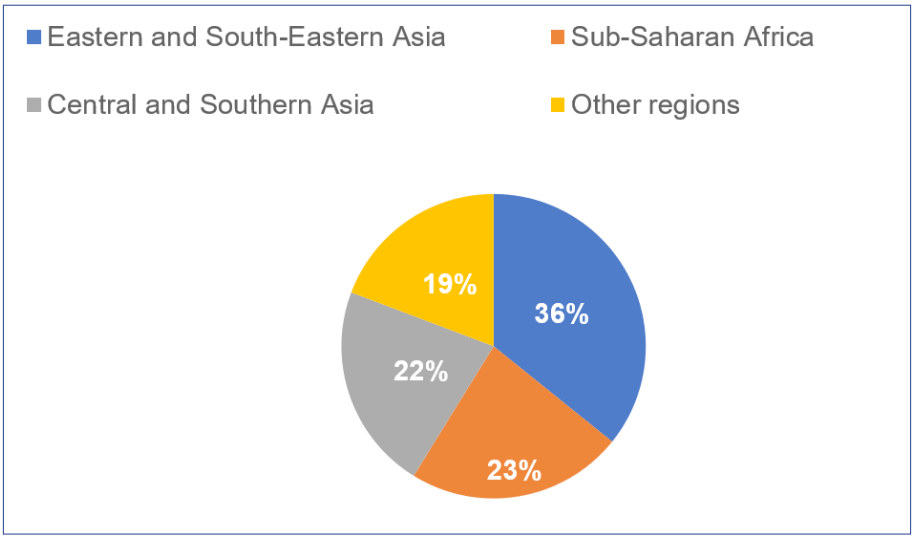
21 OECD, "The Impact of the COVID-19 Crisis on Regional and Local Governments…", cit.

2. Which sectors of infrastructures?

As we have argued, infrastructure investments must take into consideration the needs of local communities. It is therefore unsuitable to provide one-size-fits-all recipes since each country, region, town and neighbourhood has idiosyncratic characteristics that cannot be addressed by standardized projects. However, most basic necessities are common across a large number of communities. In the following sections, we therefore attempt to provide a broad list of sectors in which infrastructure investments may prove especially effective.

A basic requirement is that for housing and service facilities. A large share of the world population still lives in inadequate accommodation, often overcrowded and far from the most basic health, educational, social and commercial services (Figure 5).

Figure 5 | Urban population living in slums or informal settlements (millions of inhabitants)



Source: World Bank Data.

Even within the G20, the share of population living in degraded neighbourhoods is not negligible. This is a problem not only from a welfare perspective, but also from an economic standpoint. People living in poor conditions are less efficient in their working activities, and living far from basic services increases the amount of time that is needed to reach them to the detriment of other more productive activities. Providing better housing for all citizens has strong potential to improve both welfare and labour productivity. In addition, housing construction is known to have a sizeable and immediate impact on GDP growth.

By and large, investment in accommodation is made by individuals on a private basis. However, the opportunity cost of a new house depends on a large number of factors, and many of these are not under the control of individual investors. Public policies can therefore prove highly effective in addressing the externalities caused by these factors: these include providing clear urban development plans, related services and public infrastructures, and access to finance.

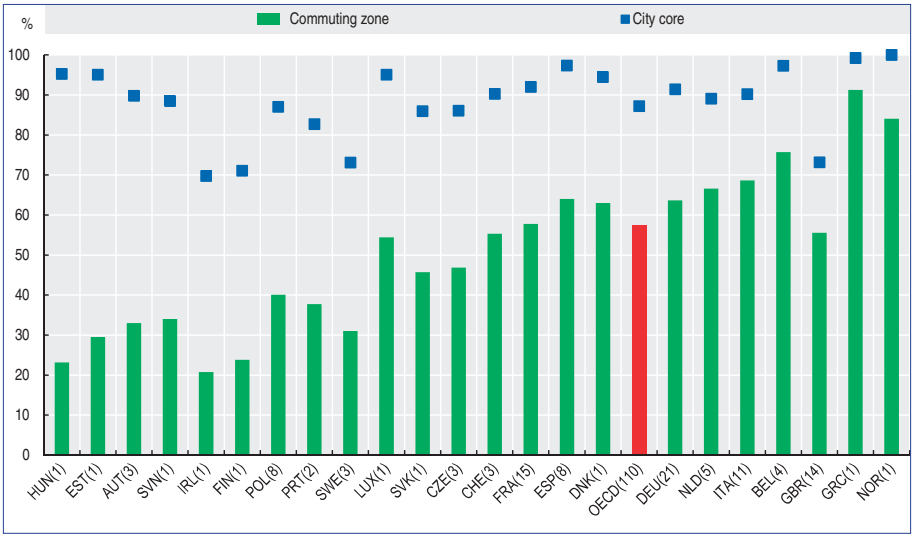
A sector in which local public investment can also prove effective is that of social facilities. Many municipalities lament a significant gap in the availability of health, education and social infrastructure, such as health centres, hospitals, schools, facilities that provide accommodation and care for the elderly or handicapped, sport facilities, cultural centres and other amenities providing assistance and fostering socialization, especially among the young, women and the very poor.[22]

Private supply of these services is often available, but in reality only for wealthier households, since fees and prices can be high. However, the cost of provision appears excessive only because their potential positive externalities are generally overlooked: these include an increase in human capital accumulation, time available for more productive activities, and lower crime rates. Once again, public policies aimed at increasing investment in local infrastructure can prove highly effective in fostering economic growth and improving welfare.

22 See for example, Council of Europe Development Bank (CEB), "Investing in Inclusive, Resilient and Sustainable Social Infrastructure in Europe: The CEB's Experience", in *CEB Technical Briefs*, November 2020, https://coebank.org/media/documents/TB_Investing_in_inclusive_resilient_sustainable_social_infrastructure_in_Europe.pdf.

The availability of social facilities and services is related to their distance from where people live, and therefore to housing policies. For example, recent estimates show that 87 per cent of people living in core metropolitan areas of OECD countries have access to health services nearby, compared with 57 per cent of people living in commuting zones.[23] Disparities within countries are even larger (Figure 6). Similarly, the United Nations SDGs show that, as a world average, only 31 per cent of people in a country live within 400 metres walking distance of an open public space, but variations among cities range from 5 per cent to 90 per cent.

Figure 6 | Access to hospitals in the core and commuting zones of some metropolitan areas, 2017 (percentage of people with access to 1 hospital within a 30-minute drive)



Source: OECD, *OECD Regions and Cities at a Glance 2018*, cit, p. 109.

An interesting strand of urban research has proposed rethinking the entire organization of cities, so that all basic services are available within 15 minutes

23 See OECD, *OECD Regions and Cities at a Glance 2018*, Paris, OECD Publishing, 2018, p. 108, https://doi.org/10.1787/reg_cit_glance-2018-en.

on foot or by bicycle from every citizen's home. The city of Paris is at the forefront of this project,[24] which can have a substantial impact on both people's welfare and cities' productivity. At the same time, it can help to reduce congestion costs and can benefit environmental sustainability, primarily by reducing CO2 and other emissions.

Additional infrastructure investment should aim to improve connections between people. The economic literature has shown that this augments the range of profitable exchanges, and that these increase welfare, productivity and growth. Indeed, connecting people is becoming more and more important, both digitally and in person. Traditional investment in urban transport, road, rail, ports and airports remains central to all local communities. At the same time, investment in digital infrastructure is starting to become the real backbone of all economic activity, and thus requires further strengthening. According to the European Investment Bank (EIB), municipalities in Europe lament a lack of investment in both urban transport and digitalization.[25] This calls for renewed investments in physical infrastructure, such as broadband networks, and also in software and organizational capital, to standardize data collection and processing.

The importance of investment in soft assets is common to virtually all sectors. For example, linking different types of personal data so as to provide effective tele-medicine services requires huge software investment, including in the protection of data privacy; collecting and processing data on commuters improves the supply of transport services and allows the creation of "smart" cities, where interconnected devices communicate with one another and with public utilities and infrastructure, leading to real-time service management.[26] Connecting physical infrastructure with dedicated networks allows for more efficient use and maintenance of infrastructure and services.[27] Big data

24 Natalie Whittle, "Welcome to the 15-Minute City", in *Financial Times*, 17 July 2020, https://www.ft.com/content/c1a53744-90d5-4560-9e3f-17ce06aba69a.

25 EIB, *Investment Report 2020/2021. Building a Smart and Green Europe in the COVID-19 Era*, Luxembourg, EIB, January 2021, https://op.europa.eu/s/oQou.

26 See, for example, the Green Cities – Smart Focus programme of the European Bank for Reconstruction and Development. Official website: https://www.ebrdgreencities.com.

27 Cambridge Centre for Smart Infrastructure and Construction, *Flourishing Systems. Re-Envisioning Infrastructure as a Platform for Human Flourishing*, Cambridge, Cambridge Centre for Digital Built Britain, 2020, https://www.cdbb.cam.ac.uk/node/2932.

management and artificial intelligence applications play an essential role in building "smart" cities.

Access to power and water is still among the basic unmet needs of many local communities, especially in developing countries. While this is notoriously the case in rural villages, the need for water and power in poorer neighbourhoods of large cities is significant in both developing and developed countries.

In a world facing the titanic challenge of global warming, all new local infrastructure should have the lowest possible impact on the environment, while specific investments should be planned to improve the sustainability of existing infrastructure and also to help environmental preservation. This can be achieved by ensuring that any infrastructure investment lessens its (direct and indirect) impact on climate change (by minimizing direct greenhouse gas emissions and throughout the entire value chain) and on the environment more generally (air, water, soil, noise pollution), and also that the climate-related and environmental risks of any infrastructure investments are taken into consideration and addressed with appropriate adaptative measures.

When considering investment in basic services, it is important to consider that they should apply to both cities and rural areas. While there is ample evidence that agglomeration boosts productivity, incomes and aggregate growth, it is also acknowledged that rapid and unmanaged urbanization can lead to regional polarization, urban congestion and economic marginalization of peripheral regions.[28] Especially in developing countries, a large share of the population suffers from the negative effects of massive urbanization, including the huge social and environmental impact of city slums. The debate on the pros and cons of urbanization has not reached a consensus, but it is incontrovertible that the COVID-19 pandemic is adding an additional element to the list of negative effects of rapid and unplanned urbanization.

28 See World Bank, *World Development Report 2009: Reshaping Economic Geography*, Washington, World Bank, 2009, http://hdl.handle.net/10986/5991; Fabrizio Barca, Philip McCann and Andrés Rodríguez-Pose, "The Case for Regional Development Intervention: Place-Based versus Place-Neutral Approaches", in *Journal of Regional Science*, Vol. 52, No. 1 (February 2012), p. 134-152, https://doi.org/10.1111/j.1467-9787.2011.00756.x; Fabrizio Barca, *An Agenda for a Reformed Cohesion Policy. A Place-Based Approach to Meeting European Union Challenges and Expectations*, European Commission independent report, April 2009, https://ec.europa.eu/regional_policy/archive/policy/future/barca_en.htm.

Regional and local policies and projects can address some of these distortions, but marginalized communities are present in rural areas and in cities alike. As long as inclusiveness is guaranteed, choosing between urban growth and support for rural areas is specific to each situation: there is no one-size-fits-all solution, and what is the most effective policy depends on the ability to leverage the strengths of each community.

3. Putting policies in practice: The governance of local infrastructure investments

Investment in infrastructure always implies major organizational challenges, which may be even more daunting locally than at the national level.

Most public infrastructure is typically considered to be public goods, and its construction can generate a large number of positive and negative externalities. This makes it impossible to reach a point of equilibrium at which private investors finance all public infrastructures that are deemed necessary. Given the existence of these market failures, governments must therefore intervene with specific policies.[29]

Decisions about which public infrastructure investment policies to adopt are complex and require the balancing of different needs and interests. This becomes more complex if only a limited number of projects can be financed because of a lack of financial resources. Local communities have many needs, which can range from the absence of broadband connections to the lack of school facilities or to traffic congestion. Different investments affect local populations in different ways, depending on their economic and social status, on where they live within the community, or on their system of preferences. Airports increase employment and connectivity to the rest of the world, but

29 Andy Pike, Andrés Rodríguez-Pose and John Tomaney (eds), *Local and Regional Development*, cit.

they cause noise and pollution. Infrastructure investments often have sizeable redistributive effects.

Deciding which needs to pursue should first depend on citizens' preferences, the more so when resources are scarce.[30] These preferences are not purely technical in nature. As argued by Helm, even a decision about which authorization to give to a private investor who is ready to build public infrastructure cannot be based only on economic efficiency considerations.[31] These choices pertain to the realm of political decisions, although they also require strong technical knowledge.

Political and institutional settings vary across the world, and the academic literature has been unable to find the optimal allocation of power and of responsibilities between central and local authorities, not even from a narrow economic perspective.[32] Indeed, even from the viewpoint of optimal decision-making on infrastructure investment, there are many examples of institutional settings that have proved equally effective. At the same time, similar institutional settings have shown largely diverging performances. The plans to recovery from the pandemic crisis that are being implemented worldwide provide a crucial opportunity to ensure that local needs are incorporated and properly supported.

Unfortunately, the political and technical layers of the decision process are often blurred, with the result that problems in public infrastructure investment governance are augmented. This is even more so for local investment, because

30 A related issue is that, according to some authors, some services should be provided based on a concept of need, because they are primary or merit goods, as suggested by John Rawls, *A Theory of Justice*, Revised ed., Cambridge, Harvard University Press, 1999, and Richard A. Musgrave, "Merit Goods", in Matias Vernengo, Esteban Perez Caldentey, Barkley J. Rosser Jr (eds), *The New Palgrave Dictionary of Economics*, London, Palgrave Macmillan, 2018. In the following, we do not pursue this line of analysis, assuming for simplicity that also the choice on the supply of these types of services is the result of a collective choice made by citizens. On these questions, see also the Foundational Economy website: https://foundationaleconomy.com.

31 Dieter Helm, "Infrastructure and Infrastructure Finance: The Role of the Government and the Private Sector in the Current World", in *EIB Papers*, Vol. 15, No. 2 (2010), https://www.eib.org/en/publications/eibpapers-2010-v15-n02.

32 Torsten Persson and Guido Tabellini, *The Economic Effects of Constitutions*, Cambridge, MIT Press, 2003; Daron Acemoglu, "Constitutions, Politics, and Economics: A Review Essay on Persson and Tabellini's The Economic Effects of Constitutions", in *Journal of Economic Literature*, Vol. 43, No. 4 (December 2005), p. 1025-1048, https://economics.mit.edu/files/4468.

municipalities tend to suffer from poor technical capability in planning and managing infrastructure projects, adding risks and uncertainty to private and public financing.[33] The typical result is a lack of financially viable projects. In its 2015 "Lessons Learned from OECD Investment Policy Reviews", the OECD stressed that revenue and sovereign risks can be greater at the local level, as management capacity is usually weaker there than centrally.[34] Thus, according to experts at the World Bank, most PPP arrangements are used in large and sovereign-backed projects, rather than in local infrastructure projects.[35]

To choose what projects should be undertaken, a clear methodology should be put in place for the assessment of projected users, revenues and costs. This should include assessment of the congruence between technical solution and needs; implementation capacity; effectiveness and transparency of procurement processes; prospected rate of return and economic profitability; expected environmental and social impact, and mitigation measures; compliance with fiduciary safeguards; resilience to climate-related and environmental risk, and related adaptive investment; and long-term sustainability based on the resources required to operate and maintain the infrastructure. Given the long-term horizon of infrastructure investments, responsibilities must be assigned not only for foreseeable events, but also for unexpected shocks. The best way to address local needs is to empower local government to conduct these analyses and take final decisions.[36] However, local initiatives also require proper coordination within the broader framework of national policies. A balance between local and central decisions is critical, so as to avoid a lack of coordination and cooperation among subnational entities and with central government, which could affect the overall effectiveness of local interventions.

33 Rob Pilkington and Marianna Buchalla Pacca, "Municipal Infrastructure Needs More Investment: Harnessing Private Capital (Responsibly!) Will Help", in *World Bank Blog: Getting Infrastructure Finance Right*, 1 October 2019, https://blogs.worldbank.org/media/36306; Jeff Delmon, "What Do Mothers-in-Law and National PPP Structures Have in Common?", in *World Bank Blog: Getting Infrastructure Finance Right*, 24 September 2019, https://blogs.worldbank.org/media/36041.

34 OECD, *Fostering Investment in Infrastructure*, January 2015, p. 23, https://www.oecd.org/investment/fostering-infrastructure-investment.htm.

35 Rob Pilkington and Marianna Buchalla Pacca, "Municipal Infrastructure Needs More Investment…", cit.; Jeff Delmon, "What Do Mothers-in-Law and National PPP Structures Have in Common?", cit.

36 Wallace E. Oates, "An Essay on Fiscal Federalism", in *Journal of Economic Literature*, Vol. 37, No. 3 (September 1999), p. 1120-1149.

A critical requirement is ensuring the accountability of all stakeholders involved in the decision-making process through, for example, the clear identification of responsibilities for each party involved; the transparency of the entire project cycle, from decision-making to implementation and operation, and to outputs and outcomes; and the inclusion of citizens and final users in key phases of the project through information campaigns and participatory processes.

If government actions are required to address market failures, government failures must also be avoided, because they can lead to inefficient investments and raise the costs of financing.[37] External evaluations and enhanced accountability can help in mitigating this problem. PPP contracts can also help to reduce potential and distorting incentives that, if unaddressed, may lead to government failures – such as short-termism, limited attention to economic sustainability and even vulnerability to corruption, especially when procurement and investment management are delegated to private entities. The set of contracts underlying PPP structures should therefore ensure the right balance between efficiency, financial sustainability and the ability to achieve public goals.

A key and related issue is the integrity of the process. Since infrastructure investments have relevant redistributive effects, various groups have a strong incentive to exert pressure on the decision-making process so as to extract specific advantages in their favour. There is significant evidence that shows this pressure goes well beyond legitimate lobbying: corruption is a pervasive phenomenon in public procurement, with massive economic and social costs. Lack of transparency in the decision-making process, for example in the assignment of responsibilities, reduces accountability and increases the risks of corruption. As shown by Schwartz et al. and by Pattanayak and Verdugo-Yepes, the pervasiveness of corruption can be addressed by ensuring up-front integrity of all parties involved in infrastructure investments, and by keeping this under constant scrutiny.[38] At the same time, these actions must find a

37 Dieter Helm, "Infrastructure and Infrastructure Finance…", cit.

38 Gerd Schwartz et al. (eds), *Well Spent. How Strong Infrastructure Governance Can End Waste in Public Investment*, Washington, International Monetary Fund, 2020, https://www.elibrary.imf.org/view/IMF071/28328-9781513511818/28328-9781513511818/28328-9781513511818.xml; Sailendra Pattanayak and Concha Verdugo-Yepesm, "Protecting Public Infrastructure from Vulnerabilities to Corruption: A Risk-Based Approach", in Gerd Schwartz et al. (eds), *Well Spent*, cit. p. 175-200.

balance with the need to guarantee a swift decision-making process and avoid red tape, which if unaddressed can reduce the timeliness of investments.[39]

To a large extent, the effectiveness of policy interventions depends on the level of strategic outlook, technical capacity and knowledge, and integrity of local institutions. If the decision-making process in planning and realizing an investment is centralized, then making the funding conditional on a minimum level of institutional and technical capacity can provide the right incentives. In this regard, dedicated bodies at central level such as the National Infrastructure Commission in the UK, MDBs – an interesting example is URBIS, a urban investment advisory platform for urban authorities developed by the EIB and the European Commission – and other supranational institutions can provide substantial technical support. Moreover, these bodies can make their financial support conditional on the adoption of sector best practices.

An additional important aspect to be considered in defining the governance of infrastructure investments is the duration of their existence, which calls for long-term commitment. Indeed, infrastructure investments take a long time to be implemented and to reach economic break-even. Significant economic losses can be caused not only by the inability to complete a project, but also by failing to provide the required maintenance or upgrade.

A subtler problem related to the long life of infrastructure investment is that of time inconsistency. As emphasized by Helm, a typical infrastructure investment requires that substantial legal, administrative, organizational and planning costs are paid ex-ante.[40] These costs can only be financed if the price for the services the project provides are set above marginal running costs when it becomes operational. However, once the project is completed, the focus is often only on running costs, with pressure to reduce prices to the level of marginal costs.

This problem becomes more severe if there is a change in government between the investment and the operating phases, or if local governments have limited

39 The EIB reports that regulatory red tape is the most frequently cited obstacle to investment. See E*IB, Investment Report 2020/2021*, cit., p. 319.

40 Dieter Helm, "Infrastructure and Infrastructure Finance…", cit.

control of tariff policies, which are often capped at the national level, especially for water, electricity and to a lesser extent transport; and this is exacerbated for investment components with (real or perceived) longer time horizons for the realization of benefits, an example being those related to climate resilience.

The time inconsistency problem creates distorted incentives. First, it may discourage private investors from investing in infrastructure, because they fear potential pressure from regulatory changes that call for a reduction of prices and tariffs and make it impossible to achieve economic viability as initially planned (a problem that is particularly severe for greenfield investments). Secondly, it may lead governments to become myopic when assessing the expected outcomes of infrastructure investments, because once the project is completed, only the marginal cost to run it will be financially acceptable to citizens (and voters). Thirdly, if contracts are difficult to enforce, public or private agencies in charge of the infrastructure will be tempted to contain the marginal running costs, typically by reducing maintenance and consequently the quality of the service provided, thus accelerating the depreciation of the investment and in some cases putting users' safety at risk.

To address time inconsistency, some countries have created independent authorities to oversee the costs and benefits of infrastructure investments in specific sectors (e.g. transport, energy, water supply and telecommunications) and to assure effectiveness, transparency, fairness and flexibility in tariff setting.[41]

Overall, a well-balanced governance arrangement for the management of an infrastructure project can help to reduce losses due to inefficiencies, which on average are estimated at more than one-third of what is spent in creating and maintaining public infrastructure.[42]

When focusing on local investments, specific governance problems add to the general ones we have described. Subnational governments play a key role

41 This mimics the ability to delegate responsibilities to an independent central bank that avoids the time inconsistency problem of monetary policy.

42 Anja Baum, Tewodaj Mogues and Geneviève Verdier, "Getting the Most from Public Investment", in Gerd Schwartz et al. (eds), *Well Spent*, cit., p. 30-49.

in implementing infrastructure projects. For example, according to an OECD report, subnational governments account for more than half the investment in the EU and in OECD countries.[43] A paper by the Asian Development Bank stresses that subnational governments are also becoming central to the provision and financing of local infrastructure in developing countries.[44] Furthermore, local authorities often manage the procurement of infrastructure projects.[45]

In an infrastructure project, there can be different degrees of centralization or decentralization of responsibilities with regard to at least three areas: "end-services" to citizens; the project cycle, including planning, appraisal, selection, budgeting and financing, implementation, adjustment during execution and ex-post evaluation; and regulation, the provision of and expectations of the enforcement of a regulatory framework.[46] Local governments have increasingly played a primary role in all these phases, from dealing with the selection and budgeting of a project, to supervising the procurement phase, managing the operation and maintaining the infrastructure.

However, as we have argued, local governments often lack the technical capacity to carry out all these responsibilities even in small projects, thus undermining the project attractiveness for investors. Local governments tend to face issues of weak institutional arrangements, insufficient transparency in investment planning and limited management capacity.[47] These factors directly affect the ability of local governments to attract investment and make best use of the capital available.[48] A recurrent problem is the inadequacy of

43 Dorothée Allain-Dupréi, Claudia Hulberti and Margaux Vincent, "Subnational Infrastructure Investment in OECD Countries: Trends and Key Governance Levers", in *OECD Regional Development Working Papers*, No. 5 (2017), https://doi.org/10.1787/e9077df7-en; EIB, *Investment Report 2018/2019. Retooling Europe's Economy*, Luxembourg, EIB, July 2019, https://op.europa.eu/s/oQov.

44 Priyanka Sood, Marshall M. Mays and Michael R. Lindfield, "Subnational Finance for Infrastructure: Potential Roles and Opportunities for ADB", in *ADB Sustainable Development Working Paper Series*, No. 20 (April 2012), https://www.adb.org/node/29768.

45 OECD, Fostering Investment in Infrastructure, cit.

46 Jonas Frank and Jorge Martinez-Vazquez, "Decentralization and Infrastructure: From Gaps to Solutions", in *ICePP Working Papers*, No. 14-05 (January 2014), https://ideas.repec.org/p/ays/ispwps/paper1405.html.

47 OECD, *Fostering Investment in Infrastructure*, cit.

48 Jörn Philip Eichler, Alexander Wegener and Ute Zimmermann, *Financing Local Infrastructure. Linking Local Governments and Financial Markets*, Eschborn, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), May 2012, http://admin.riafco.org/Images/Ressources/Pulication/49/Financing%20local%20Infrastructure%20Finance%20final%20-%20GIZ%202012.pdf.

existing procurement systems and the capacity to run them. To mitigate these issues, and therefore maximize the impact of the investment and attract private capital, capacity-building assistance is of paramount importance.

In principle, it may appear that governance problems are better addressed at the local level, given that those in charge can directly manage procurement (be it local, national or international), supervise the construction process and deliver the infrastructure directly to final users. Subnational governments are also well placed to manage and maintain the infrastructure directly or to outsource these functions to other providers. However, this apparent advantage may be offset by the fact that local governments operate in an institutional framework that is often very weak and overburdened by coordination problems with other subnational and national institutions. As a result, there is often a lack of policy coherence between these authorities, which is especially damaging when it affects the timely transfer of funds from central government (or regional government) to the municipality. Moreover, an asymmetry can exist between service providers and local governments. While the former often deal with dozens of similar infrastructure projects at the same time, the latter may be dealing with a one in 20–30 year transaction.

Subnational agencies and local authorities may lack competence or familiarity with regulations, guarantees and contractual clauses, adding uncertainty over the regulatory environment. According to a World Bank report, subnational authorities have become an increasing source of regulatory risk for investors, particularly because of risks that are associated with breach of contract, adverse regulatory changes and indirect expropriations.[49] Local investment policies are actually more effective when they are implemented in strong coordination with national governments. Independently from how they organize their investments, subnational governments must coordinate the needs and preferences of local communities with the priorities and plans of their national government so as to avoid duplications, distant and centralized planning, and ensure service delivery and sustainability. Moreover, they must identify and plan infrastructure projects in coordination with neighbouring regions.

49 See World Bank, *Retention and Expansion of Foreign Direct Investment. Political Risk and Policy Responses*, Washington, World Bank, 2019, http://hdl.handle.net/10986/33082.

Further cooperation and coordination can also be sought with supranational organizations and MDBs, whose involvement can also mitigate potential governance problems and establish a positive environment for private investments in local infrastructures. For example, the European Bank for Reconstruction and Development (EBRD) has recently launched the EBRD Green Cities programme, which provides technical support to local governments.[50]

An area where technical assistance has been particularly effective is standardization. If small projects are designed with a standardized approach, transaction costs can be reduced and the risk–return ratio can be improved, thus making projects more attractive to private investors. Even though each infrastructure project has its own specific features, standardized tools have been introduced in some areas of project appraisal and implementation.[51] Many countries have developed standard models of bidding and contractual documents, and international organizations have also worked on standardized financing agreements.[52] An interesting example is the Global Infrastructure Facility – a partnership between governments, MDBs including the IFC and other multilateral development banks, and private investors – that has promoted standardized streetlight PPPs among Brazilian municipalities.[53] The scheme has lowered transaction costs and risks, ultimately incentivizing private investments.[54] Another interesting project by the World Bank is the Scaling Solar programme, which provides national – and potentially local – governments with a standardized package that includes document templates, competitive financing and insurance products.[55]

However, to further attract private financing of local infrastructure, improvements in the regulatory framework and enabling environment are

50 See the official website: https://www.ebrdgreencities.com/about.

51 Gianluca Bacchiocchi et al., "Getting Infrastructure Projects Right: A Legal Adviser's View on Standardization", in *McKinsey Commentaries*, 15 January 2015, https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/getting-infrastructure-projects-right-a-legal-advisers-view-on-standardization.

52 See Public-Private-Partnership Legal Resource Center (PPPLRC) website: *Standardized Agreements, Bidding Documents and Guidance Manuals*, updated 3 December 2020, https://ppp.worldbank.org/public-private-partnership/node/3656.

53 Rob Pilkington and Marianna Buchalla Pacca, "Municipal Infrastructure Needs More Investment…", cit.

54 See PPPLRC website: *Standardized Agreements, Bidding Documents and Guidance Manuals*, cit.

55 See the official website: https://www.scalingsolar.org.

needed. To help subnational governments to achieve better and more inclusive infrastructure, improving local public governance is as important as reducing existing financial gaps. Several MDBs and national financial institutions have indeed launched programmes to promote investment in local infrastructure.[56] New tools and best practices have been designed and promoted with the aim of leveraging private capital by reducing risk, guaranteeing the investment and adding public funding. Positive results have been achieved in some of these areas, although the World Economic Forum Global Future Council on infrastructure reported that practitioners have difficulties in choosing the correct tool from the wide range available.[57] This is particularly true at the local level, where public authorities and practitioners are less familiar with multilateral initiatives. For example, in Europe, subnational governments have not used the European Fund for Strategic Investment (EFSI), which aims to facilitate private investment in infrastructure. According to a study by the Committee of European Regions, only 7 per cent of surveyed subnational governments are well informed about the opportunities offered by the EFSI. Moreover, even if informed, the survey shows that local governments have insufficient technical expertise and are unable to find investors to partner with, as required by EFSI.[58]

On the other hand, it is critical for central governments and MDBs to partner with local governments so as to avoid that investments are disconnected with the needs of local communities.

56 OECD, *OECD Business and Finance Outlook 2020. Sustainable and Resilient Finance*, September 2020, Ch. 7, https://www.oecd-ilibrary.org/sites/056af93d-en/index.html?itemId=/content/component/056af93d-en.

57 Rashad-Rudolf Kaldany, Anita George and Joseph Losavio, "This Is What Sustainable Infrastructure Looks Like and Why It Will Fast-Track Recovery", in *World Economic Forum Articles*, 21 September 2021, https://www.weforum.org/agenda/2020/09/this-is-what-sustainable-infrastructure-looks-like-and-why-it-will-fast-track-recovery.

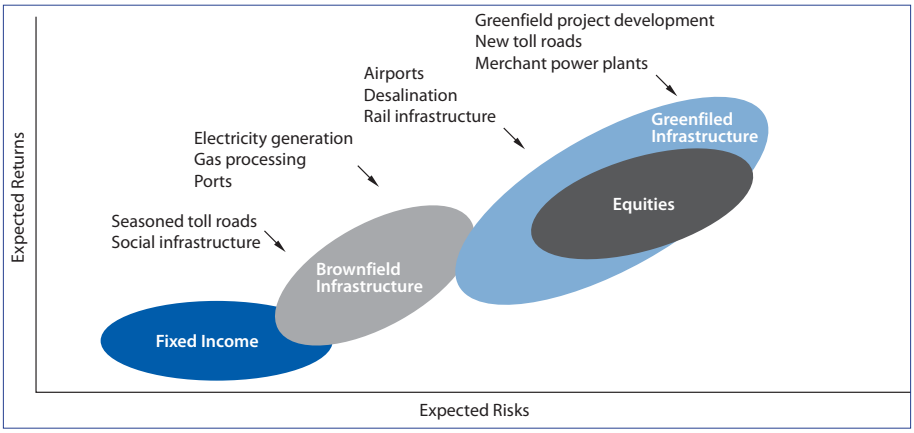
58 Dorothée Allain-Dupré, Claudia Hulberti and Margaux Vincent, "Subnational Infrastructure Investment in OECD Countries", cit.

4. Putting policies in practice: Funding and financing local infrastructure investments

4.1 The general problem

In a perfectly functioning and efficient market, infrastructure would be paid for by its users.[59] But as we have already argued, the market for public infrastructure is far from efficient, and the pervasive presence of negative externalities and other forms of market failure make financing infrastructures a difficult task, especially at the local level. As a result, private investors are by and large underrepresented in the local market, especially in the case of greenfield investments, which are considerably riskier (Figure 7).

Figure 7 | Risk–return profiles of different infrastructure investments

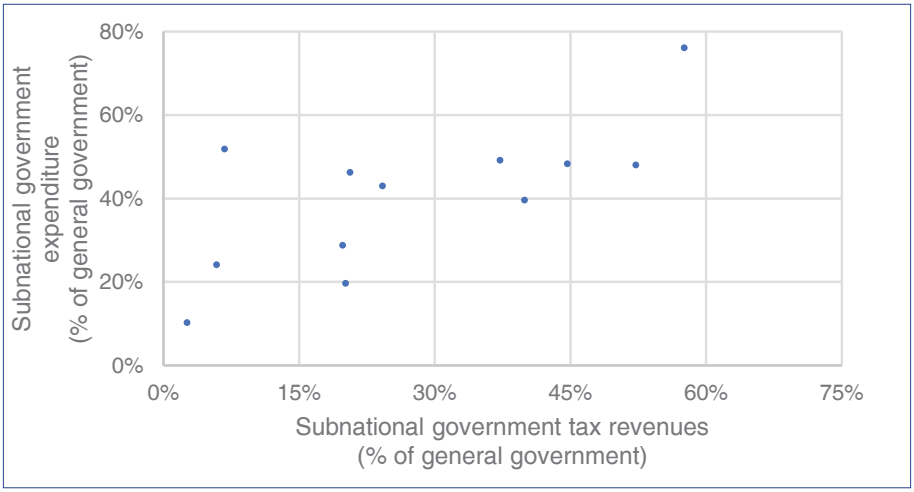


Source: Georg Inderst, "Infrastructure as an Asset Class", in *EIB Papers*, Vol. 15, No. 1 (2010), p. 70-104 at p. 79, https://www.eib.org/en/publications/eibpapers-2010-v15-n01.

59 Redistributive policies, such as progressive taxation systems, might be envisaged to ensure that needed infrastructures are also provided to the part of the population that cannot afford them; but this is a separate issue with respect to the identification and financing of public infrastructure.

At the same time, public financing is largely insufficient (Figure 8), partly as a result of the restrictive public finance policies that were put in place in most countries after the global financial crisis of 2007–2008.

Figure 8 | Subnational government expenditures and tax revenues



Source: OECD, "The Territorial Impact of COVID-19", cit., p. 26 and 27.

To better understand the problem of providing enough resources to finance infrastructure investment, a crucial distinction is to be made between funding and financing.[60]

Project funding refers to how revenues are collected so as to pay for the cost of the infrastructure. It often covers many years, possibly the entire life cycle of the infrastructure, but it is limited to two broad alternatives (or a mixture of them): general purpose taxation (either national or local) and user charges or fees.

Project financing refers instead to how ex-post funding is turned into ex-ante capital. Consider, for example, the project-financing of a toll bridge or a

60 Peter O'Brien and Andy Pike, "The Financialization and Governance of Infrastructure", in Ron Martin and Jane Pollard (eds), *Handbook on the Geographies of Money and Finance*, Cheltenham, Edward Elgar, 2017, p. 223-252.

cable car in a ski resort. To address the funding problem, the investor needs to assess the profitability of the project by comparing the discounted value of future revenues from users' fees, net of running costs, with the initial cost of the infrastructure. However, even if the project is assessed as profitable, the investor may be unable to provide all necessary funds, facing therefore a financing problem. Funding and financing problems are not independent, because low uncertainty on funding typically facilitates financing. Normally, future revenues coming from fees are likely to be more uncertain than those coming from future taxation. This increases the economic risk of the investment and makes its financing more difficult.

However, choosing between taxation, fees or a combination of the two is not a financial issue but a public choice one. In practice, providing the entire population with free health, schooling and security infrastructure is politically appealing and a key objective of many governments. Therefore, in these cases, infrastructure must be funded, at least in part, through general taxation. With sufficient political support, any infrastructure can be funded through taxation, even at the local level. Tax Increment Financing (TIF), for example, has been used to fund local development projects in Wisconsin and Chicago in the USA, and in Newcastle, Sheffield and Nottingham in the UK.

However, as public budgets are increasingly constrained, national and subnational governments are mobilizing private funding of infrastructure. The incentive in this sense is even stronger for subnational governments, which have substantial responsibilities for infrastructure development and maintenance, but often lack a corresponding and sufficient fiscal decentralization authority. Moreover, even when subnational governments can fund their investments through local taxes, these are often insufficient to meet the demands of infrastructure. Indeed, most local revenue is allocated to the operating costs of subnational entities, leaving little for capital investment.

In principle, political support for the introduction of fee funding could be easy to obtain when revenues are generated by those same individuals who benefit from the infrastructure. This implies a direct payment, with citizens being required to pay a fee for using a public service, such as accessing a theatre or a public sport facility. But it can also imply an indirect payment, an example being where some parts of the infrastructure are contracted to a third party that has

the right to sell its products or services within the premises, thus profiting from locational monopoly rents. Of course, deciding the level of fees to be applied is a difficult task given the political resistance that fee-setting usually encounters, especially if the infrastructure generates a significant monopoly rent. In some cases, a viable solution is to set low fees and subsidize the remaining part through transfers from national or local government, or from both.

In practice however, it is unlikely that socially acceptable fee-setting and funding can go ahead without broad and sustained political support. Moreover, even when they are paid by users' fees, infrastructures usually generate relevant negative externalities, and it is unlikely that fee revenues can balance the social cost of providing the service. An example of this is transport infrastructure, such as airports and railways, whose presence benefits some citizens by increasing accessibility and fostering tourism, but damages others because of noise, congestion and pollution. Often, funding comes from a mix of general taxation and fees, national and local governments playing a pivotal role in guaranteeing the economic viability of any infrastructure investment.

An additional critical aspect is fiscal sustainability. Sound project financing requires that expected cash flows from the investment are adequate and balanced. If funding comes from taxation, future revenue must be sufficient to repay the debt incurred to sustain the investment. Moreover, central governments tend to allow sub-sovereign lending only under clear rules and restrictions, as they fear that subnational debts may be unsustainable and generate ripple effects affecting fiscal consolidation. On the other hand, the lack of clear sovereign backing up may disincentivize private investors because risks are not fully covered. Indeed, there have been many instances where the fiscal sustainability of projects was not guaranteed. This can lead to default, either at local or at sovereign level, but only in extreme cases; more often, fiscal unsustainability leads to the premature ending of the investment or to an inability to provide for its maintenance. In both cases, the result is that the investment is socially inefficient. Hence, ensuring the fiscal sustainability of infrastructure investment becomes a key issue. A useful instrument that addresses this is the Public Investment Management Assessment (PIMA) framework that has been adopted by the International Monetary Fund, which

deals in particular with infrastructure governance practices.[61] This framework can also help local governments to assess private investments.

Given the strains on public finances, a crucial aspect is maximizing the value of existing infrastructure assets. One interesting and underexploited option is to upgrade existing infrastructure, thus increasing its value and making it at the same time more effective and longer lasting. While this lever has often been neglected by policymakers in the past, it commands attention in the current context of constrained finance, ageing facilities and rising demand. The Swiss transportation policy, for example, explicitly stipulates that optimal management of existing capacity has priority over capacity expansion.

While taxation and user fees remain the main sources of funding for infrastructure investments, it is not always the case that funding availability is sufficient for adequate financing. Different ways of ensuring that adequate funding guarantees sufficient financing have been proposed, such as bank lending, syndicate lending, bond issuing and securitization. Indeed, the quest for infrastructure financing has been long-running and one of the main drivers of financial innovation.[62] However, as argued by Pike and O'Brien, the increased strains on public finance after the global financial crisis of 2007–2008 have increased the appeal for innovative funding techniques, including new financialization solutions,[63] which make marketable the expected net present value of future revenues generated by infrastructure. Financialization is based on a strict linkage between investment and its funding, which is secured when funding comes from fees (or targeted taxation as in the case of TIFs) or when the infrastructure itself is posted as collateral. On the contrary, when infrastructure investments are funded using general taxation and the infrastructure is not a collateral, financing is indistinguishable from that of government debt, be it local or national.

61 PIMA resources are available at https://infrastructuregovern.imf.org/content/PIMA/Home/PimaTool.html.

62 For example, in the second half of the nineteenth century, stock and bond issues financed railroad construction in the USA. See Alfred D. Chandler Jr, "The Railroads: Pioneers in Modern Corporate Management", in T*he Business History Review*, Vol. 39, No. 1 (Spring 1965), p. 16-40.

63 Peter O'Brien and Andy Pike, "The Financialization and Governance of Infrastructure", cit.; see also Phillip O'Neill, "The Financialisation of Urban Infrastructure: A Framework of Analysis", in *Urban Studies*, Vol. 56, No. 7 (May 2019), p. 1304-1325, https://doi.org/10.1177/0042098017751983.

Financialization is crucial in the case of PPPs, in which governments and private investors join forces on the investment. In this case, private investors have to anticipate the required funds in exchange for their rights to future revenues, possibly with a guarantee from public authorities.

Before turning to examples of financialization, it is important to understand what drives it. If governments were to finance new projects autonomously, they could only do so by raising taxes or increasing public debt. However, as argued by Helm, if the resources required for initial investment coincide with the net present value of future revenues, the government would not be increasing its liabilities (i.e. its debt) if an inter-temporal perspective is taken.[64] But there is no consensus on how national accounts should distinguish between government expenditures used to finance consumption and those that are used to finance investments, creating an incentive for private participation in public infrastructure investment.

A related issue is the cost of financialization; that is, the interest rate to be paid on the sums made available for the investment, which depends on the risk of the investment itself. Indeed, the rate that private investors demand when financing infrastructure depends on the expected revenues, and on the likelihood that such expectations are met or not.

Historically, public debt has been considered less risky than private debt, suggesting that financialization increases the costs of infrastructure investments. However, this general rule can be easily challenged. First, there are cases in which government debt is more expensive than private debt in the same country. Secondly, even a small increase in the interest rate on government debt, caused by the need to finance infrastructure investments, may impact on the whole stock of new government debt to be renewed. Thirdly, since it is unlikely that it is economically efficient that all risks are held either by the government or by private investors, PPPs can be an efficient way to allocate and spread them, thus reducing the overall cost of financing. Moreover, the issue of asymmetric capacity between public and private entities in negotiating the related contractual package exists. Indeed, the G20 Global Infrastructure

64 Dieter Helm, "Infrastructure and Infrastructure Finance…", cit.

Hub initiative has made available a thorough analysis of how different risks should be allocated between governments and private investors within PPPs. Lastly, the participation of private investors in financing an infrastructure investment increases their commitment to participate in it longer term, or at least to oversee its completion. The guarantee of better governance, enabled by private involvement, can reduce the riskiness of the project and, in turn, the cost of financing.[65] As argued by Eduardo Engel et al., the riskiness of an investment is not independent from the overall incentive structure.[66]

Among the range of financial instruments currently available, loans and bonds are the most important source of infrastructure financing. Commercial banks are a major source of private financing for infrastructure investments, either through loans or bonds.[67] However, owing to their funding models based on short-term liabilities, and owing to the tight constraints in the prudential regulations under which they operate, commercial banks face significant constraints when allocating long-term lending for infrastructure projects, especially at the local level.

In contrast, institutional investors – pension funds, sovereign funds and insurance companies – while holding long-term assets in their balance sheet, make only a limited contribution to infrastructure investments. For institutional investors, the challenge of dealing with this area, which includes a lack of appropriate financing vehicles, significant regulatory barriers and scarce availability of data and information, is amplified by their lack of experience in the field. While they are increasingly looking for new investment opportunities in the current low interest rate environment, to match their long-term liabilities, their lack of experience and of clarity in strategy undermines

65 Robert L. Engle et al., "Entrepreneurial Intent: A Twelve-Country Evaluation of Ajzen's Model of Planned Behavior", in *International Journal of Entrepreneurial Behavior & Research*, Vol. 16, No. 1 (2010), p. 35-57.

66 See Eduardo Engel, Ronald Fischer and Alexander Galetovic, "The Economics of Infrastructure Finance: Public-Private Partnerships versus Public Provision", in *EIB Papers*, Vol. 15, No. 1 (2010), p. 40-69, https://www.eib.org/en/publications/eibpapers-2010-v15-n01; also Can Chen and John R. Bartle, *Infrastructure Financing: A Guide for Local Government Managers*, A Policy Issue White Paper for ICMA (International City/County Management Association) and GFOA (Government Finance Officers Association), January 2017, https://icma.org/node/64992; Rob Pilkington and Marianna Buchalla Pacca, "Municipal Infrastructure Needs More Investment…", cit..

67 Torsten Ehlers, "Understanding the Challenges for Infrastructure Finance", in *BIS Working Papers*, No. 454 (August 2014), https://www.bis.org/publ/work454.htm.

the attractiveness of infrastructure investments. To face some of these issues, the OECD developed in 2014 the "G20/OECD High-Level Principles for Long-Term Investment Financing by Institutional Investors" and a checklist to assist governments in self-assessing their support schemes for long-term investment financing.

4.2 The case of local investments

In the case of local projects, the funding and financing problems here described are magnified. While this is because of a variety of reasons, most of them are related to weaker governance, as discussed in Section 4. They include:

- Municipalities can be less reliable than national governments when they commit to an increase in local taxation to repay the initial cost of the investment. As a result, the debt generated by the investment is riskier and charges higher interest rates.
- Municipalities face higher variability in the business cycle, because they have fewer diversification opportunities. This increases the riskiness of future revenues associated with the investment, be they fiscal or based on fees. Moreover, public budgets of subnational governments have a lower capacity than those of national governments.
- If infrastructure users nearly coincide with voters, it is more likely that they will be unwilling to pay fees above marginal costs, exacerbating the time-inconsistency problem described in Section 4. A typical example is that of public transportation. Again, this increases the riskiness of the investment, and increases the required interest rate.
- As already discussed, local projects face coordination problems with the strategies of neighbouring municipalities and with regional and national policies. This increases uncertainties around the regulatory framework of the investment, again increasing the risk that it will not be completed, or at least not according to original plans.
- Especially in weaker and less developed contexts, local authorities are likely to have lower technical and managerial capabilities than national governments, making governance of the investment more problematic.
- Fixed costs faced by external investors in acquiring information on the economic viability of a project are more prevalent in the case of smaller infrastructure projects, such as those planned locally, thus increasing their

financing costs.

A gradual and modular approach to building local infrastructure can reduce initial financing needs, exploit future returns to finance the expansion of a facility, and gain credibility and external support. Other players at various levels (local, national and international) can be invited to finance different stages of the project. The higher uncertainties in the initial project phases may be mitigated by credible commitment from MDBs or national governments, or even by the endorsement of independent authorities. The subsequent phases may instead be supported by strong local and private involvement. For example, a public library can be financed by an initial public investment, to make the facility available and acquire the core book collection. Once the library is open, the management and renovation costs that follow can be financed through rents paid by private vendors operating within the library's facilities. Similar flexible approaches can be used at nature reserves and sport facilities.

MDBs and international donors can play a pivotal role in financing local infrastructure investments if they also include local financial players in their schemes. Improving the enabling environment and the capacity of local financial actors can reduce the interest rates charged on borrowing, but also create positive financial synergies between private actors, international lenders and local government.[68]

Leveraging local private finance depends on factors such as the nature and strength of the relationship between national and subnational governments, the ability of local government to produce coherent strategies and plans that can attract national and international private investments, and the effectiveness of public and private institutions in managing both mature and fledgling city-/region-wide governance agreements.

Similar to national governments, local governments can finance infrastructure projects through debt financing (either private bank loans or municipal bonds),

68 World Bank, *From Billions to Trillions: MDB Contributions to Financing for Development*, Washington, World Bank, July 2015, https://documents.worldbank.org/en/publication/documents-reports/documentdetail/602761467999349576.

tax revenue, user fees and state grants.[69] Even though the traditional sources of funding – such as grants – have been decreasing owing to public finance restraints, diversification remains limited at a subnational level. According to an OECD survey, only 7 per cent of subnational governments – mainly at metropolitan and regional level – have reported a solid increase in private participation in infrastructure investments since 2010.[70]

A potential advantage of local infrastructure projects is that, with a few exceptions such as waste water plants or hospitals, they require a smaller amount of capital to be implemented, and this can be more easily provided by local financial markets. Nevertheless, local financial players are often small, and have limited experience in assessing the riskiness of infrastructure projects. Local syndicated lending, possibly in partnership with large specialized financial institutions, might help to solve these problems, in addition by leveraging the deep knowledge of local players that local banks often have.[71] As private lenders are restricted to take funded exposure on a single borrower of their capital as well as non-funded exposure of their capital, in addition to internal prudential limits to loan exposure for a single customer, loan syndication could help investors in financing infrastructure projects. The global syndicate bank loan market is already large, and MDBs have been active in promoting the syndication of loans as a reliable instrument to mobilize private finance. However, to facilitate these operations at local level and with small financial entities, there is a need to further improve and ease the regulatory framework and the standardization of contracts.[72]

Overall, the improvement and expansion of financial instruments available at a local level should aim to attract both local financial players and international finance and should work together with capacity-building assistance. In this context, the Local Finance Initiative (LFI) of the United Nations Capital Development Fund (UNCDF) is a positive example.[73] The aim of this initiative

69 OECD, *Infrastructure Financing Instruments and Incentives*, Paris, OECD, 2015, http://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf.

70 Dorothée Allain-Dupré, Claudia Hulbert and Margaux Vincent, "Subnational Infrastructure Investment in OECD Countries", cit.

71 Jörn Philip Eichler, Alexander Wegener and Ute Zimmermann, *Financing Local Infrastructure*, cit.

72 Jang Ping Thia, "Bank Lending – What Has Changed Post-Crisis?", in *Journal of Economics and Finance*, Vol. 43, No. 2 (April 2019), p. 256-272.

73 UNCDF website: *Local Development Finance*, https://www.uncdf.org/local-development-finance.

is to leverage the UNCDF's initial investment and formation of fixed capital so as to mobilize private capital in small infrastructure projects. Moreover, the LFI helps local governments in fostering coordination with domestic banks and local businesses when designing and developing financing vehicles that invest in local infrastructure.

Yet the ability of local governments to deploy private capital from local and large investors is still limited because of the uncertain underlying risks and opportunities of the investments.[74] To cover the life-cycle costs of infrastructure projects, local governments also need to consider that each phase of a project could require different financing instruments and could call for a different role for governments, banks and capital markets.[75]

In principle, the most effective way to foster private participation in local infrastructure is to promote local PPPs, as they can be more attractive for local investors when there is no foreign exchange or debt risk. Moreover, as these infrastructure investments are local in nature, they can match community needs more efficiently. However, they are lacking at a local level: these arrangements require expertise and can have high administrative sunk and transaction costs, making them more challenging than large PPPs that are implemented with sovereign back-up.[76] Furthermore, these projects tend to lack in costs and structure standardization. According to a 2014 research carried out by the World Bank, PPPs at a local level face several constraints, for various reasons:[77]

- local governments tend to have inadequate fiscal resources, requiring external financial support;
- local governments can experience a low creditworthiness profile as revenue recovery is often associated with higher risks and fiscal sustainability;
- capital markets for financing local infrastructure projects are underdeveloped;
- small-scale infrastructure projects tend to be characterized by a distinct

74 Jörn Philip Eichler, Alexander Wegener and Ute Zimmermann, *Financing Local Infrastructure*, cit.
75 Torsten Ehlers, "Understanding the Challenges for Infrastructure Finance", cit.
76 Rob Pilkington and Marianna Buchalla Pacca, "Municipal Infrastructure Needs More Investment…", cit.; Jon Kher Kaw, Hyunji Lee and Sameh Wahba (eds), *The Hidden Wealth of Cities. Creating, Financing and Managing Public Spaces*, Washington, World Bank, 2020, http://hdl.handle.net/10986/33186.
77 World Bank, *A Preliminary Review of Trends in Small-Scale Public-Private Partnership Projects*, Washington, World Bank, 15 August 2014, http://hdl.handle.net/10986/21060.

contract and risks profile, making standardization challenging;
- small projects are likely to present higher costs for technical and financial documentation as well as a higher risk profile;
- central governments often do not have mechanisms to efficiently support small-scale projects.

A solution could be to introduce central PPP units that can support local governments throughout the different phases of a PPP project, with a focus on local capacity-building throughout the entire project cycle.[78] The World Bank has developed the Municipal PPP Framework to help share best practices in local government PPPs.[79] The LFI has also developed an interesting form of PPPs, Public–Private-Community Partnerships, in which local communities and villagers are concurrently a partner and a beneficiary of the partnership. This arrangement ensures that local needs and interests are safeguarded during all phases of the project. However, to fully benefit from these opportunities, an effort is required to address the lack of expertise and technical resources of local communities.[80]

An additional source of private financing could come from issuing municipal bonds. Despite many challenges, the development of subnational bond markets has great potential to channel private investments for local infrastructure.[81] So far, according to the World Bank, only large and the most creditworthy subnational governments have been able to properly leverage municipal bonds, because issuing them is an extremely complicated financial operation that requires high expertise, making the fixed costs too high for small volumes.[82] Several mechanisms and tools have been put in place to mitigate

78 Ibid.
79 See PPPLRC website: *Municipal Public-Private Partnership Framework*, updated 18 March 2021, https://ppp.worldbank.org/public-private-partnership/node/3881.
80 UNCDF, *A Local Finance Initiative Programme Report*, January 2017–December 2019, October 2020, https://www.uncdf.org/article/6137.
81 Despite being issued by private industrial companies rather than by public subnational entities, Italy's market of mini-bonds can show how a political effort can also empower smaller entities in successfully issuing debt securities, diversifying their sources of financing. See Politecnico di Milano – School of Management, *2019 Italian Minibond Industry Report*, https://www.minibond.tv/files/siti/minibond.tv/osservatorio-minibond/201904-italia-minibond-industry-report.pdf.
82 Lili Liu, Michael De Angelis and Sally Torbert, "Municipal Pooled Financing of Infrastructure in the United States: Experience and Lessons", in *World Bank Policy Research Working Papers*, No. 8212 (October 2017), http://hdl.handle.net/10986/28547.

these issues and to unlock new financial instruments at a local level. Although municipal governments may need to borrow only a small amount of capital, the cost to issue bonds may simply be too high. Therefore, pooling small loans from municipal governments into an aggregated municipal bond issuance could reduce fixed costs by sharing up-front administrative costs, and could lower the interest rates of borrowing as a result of credit score improvements. The efficiency of primary and secondary markets of municipal bonds can also be enhanced, possibly allowing packaging and trading through electronic platforms, increasing their liquidity and therefore reducing their costs.

Nevertheless, to properly design and implement such financial mechanisms, countries need to have in place a robust national framework that regulates the process in detail. To arrange this framework is a complex proposition as it also needs to address the moral hazard problem caused by subnational bonds, especially when there is the expectation that central government will be liable in the case of a subnational default.[83] An interesting example of a comprehensive framework is the Priority School Building Programme, launched by the UK government to increase private investments and reduce transaction costs, which has aggregated funding requirements for each batch of schools.[84]

Alternatively, to mitigate the risks associated with municipal bonds, governments can encourage the establishment of national private or public entities that aim to support municipal bonds issuance. These independent entities could lessen the risks for investors, promote a standardized approach to risk analysis, improve local oversight on projects and reduce the transaction costs of bond issuance for local governments.

To summarize, Table 1 lists some prominent financing means and their main funding mechanisms. The simplest and most common means of financing local infrastructure investments is by using national or supranational grants that, however, are often insufficient to satisfy the needs of local communities. The alternative is debt, which may have various forms – as listed in Table 1.

83 Ibid.

84 See UK Education & Skills Funding Agency, *Priority School Building Programme: Overview*, updated 6 December 2016, https://www.gov.uk/government/publications/psbp-overview/priority-school-building-programme-overview.

Table 1 | Funding and financing local infrastructure investments

Financing	Funding	Description
Grant (Transfer)	National taxation	Transfers from national government to local municipalities, funded at national level through taxation
Government loans	Fees or taxation	Loans from national government to local municipalities, to be refunded
MDB loans	Fees or taxation	Loans from supranational organizations (such as MDBs) to local municipalities, to be refunded
Bank debt	Fees or taxation	Bank loans to local municipalities, possibly from MDBs and state infrastructure banks, or from lending syndicates
Bonds	Fees or taxation	Issuance of bonds by local municipalities
Revenue bonds	Fees or taxation	Issuance of bonds, possibly through a special purpose vehicle, to be repaid with revenues from the investment
Developer fees	Fees	Request of fees to be paid by developers who obtain private benefits from the project, for example in exchange for concessions
Asset leasing or sale	Not needed	Sale or leasing of public assets to private investors, for the realization of specific investment projects
Private financing	Not needed	Private investments in local infrastructure, made profitable by concessions and/or provision of related public goods (e.g. sporting facilities made accessible by public transports or roads)
Investment platforms	Fees or taxation	Mixed financing structures attracting different private and public investors
Peer-to-peer lending	Fees or taxation	Private lending by retail investors to finance specific investment projects
Public–private partnerships (PPPs)	Fees or taxation	Partnerships between public and private partners, adopting any of the funding and financing schemes described above

With respect to bank debt and bonds, lending terms offered by national governments or supranational institutions are typically cheaper. Bond financing can be difficult because it entails large fixed costs and can be seen as risky by private investors, as argued earlier. With respect to general bonds, revenue bonds allow for a more transparent matching of the cash flows from

the investment, thus making it easier for investors to assess their riskiness. However, they can be funded almost exclusively by fees or TIFs, thus making them a less suitable financing means for investment in infrastructures such as hospitals or schools.

Developer fees, asset leasing or sale and private financing are all based on a similar principle: that it is possible for subnational governments to leverage either on the value of the assets that they own, by selling or leasing them, or on their rights to grant valuable administrative concessions. The main advantage of these forms of financing is that they do not present significant funding problems, if any. The disadvantage is that they are unlikely to provide a relevant amount of revenue, unless a significant stock of public assets is sold to private investors.

Investment platforms are not a financing tool per se, but rather a market infrastructure that allows a better matching of demand and supply of funds, thus reducing financing costs. Peer-to-peer lending platforms are similar in spirit to investment platforms, but they are better suited to attract small lenders, possibly individuals. They could prove effective in financing small local projects, by attracting investors from the same group of prospected beneficiaries of the proposed infrastructure.

Finally, private–public partnerships can adopt any kind of financing and funding mechanism. In general, mechanisms mixing the different funding and financing mechanisms described in Table 1 can be used, as will be clear from some of the examples presented in the next section.

5. Some experiences of local infrastructure investment schemes

Specific examples of successful local infrastructure investments can help us to understand how the governance and finance problems previously described have been addressed in practice. In the following, we describe some projects in developed and developing countries that may provide interesting insights for future initiatives.

5.1 USA: Milwaukee Tax Incremental District #24

A Tax Incremental District (TID) is a specific type of TIF, which allows a municipality to promote growth in a specific district by borrowing on the district's future growth in taxable property value. In Wisconsin, TIDs may be created for three types of projects: blight or environmental remediation, industrial development and mixed-use development.

The projects are financed in three steps. First, a year-one base value for all property within the TID is calculated. As the city invests money in the district to upgrade roads, add sewer services, provide incentives to developers, rehabilitate old buildings or remediate brownfields, all the taxes on all property value growth above this base value are used to pay off the costs of the improvements. Taxes are collected on the full property value of the TID. The amount generated from the base value is then sent to local governments, while all remaining tax revenue pays back TID debts until all project costs are repaid.

The object of TID #24 in Milwaukee was to redevelop 43 acres of land, which had been the site of large automotive plants, but had become an area with poor economic growth after the plants shut down. To this purpose, in 1994 the City of Milwaukee created a TID called Riverworks Industrial Center, a TIF referring to that specific area, with the purpose to encourage the rehabilitation and expansion of sound manufacturing and industrial buildings.

The project attracted a healthy mix of commercial and manufacturing development. At the time when the project amendment was adopted, 1.4 million US dollars were planned to be spent on reconstruction of streets, upgrading of sewage and lighting service, or installation of streetscapes, and 750,000 US dollars were used to fund loans for development projects within the TID.

According to Wisconsin's Department of Revenues, in the first seven years of the project, Milwaukee TID #24 generated an increment in the total amount of taxable value between 55 and 60 million US dollars, whose tax revenue has been used entirely to pay off project costs. The overall value increment was

about 12 million US dollars.

5.2 India: pooled municipal bond issuance in Tamil Nadu

The objective of the project was to finance the construction of infrastructure for water and sanitation. To this purpose, the Water and Sanitation Pooled Fund (WSPF) was created in 2002 to act as a financial intermediary between municipalities and the capital markets. WSPF issued a bond to raise the funds used to lend to the cities involved in the project. Debt was repaid from project and municipal revenues, including water tariffs, and from interest earned on the money deposited from connection fees to urban local bodies (ULB).

The financial structure of the operation was rather complex. The fund was backed by a 50 per cent guarantee on the principal amount from the US government to protect investors, favouring a reduction in the cost of borrowing. A multilayered credit enhancement package was designed in order to extend the maturity of the bond and increase investor confidence. A second level of enhancement was created by legally requiring the 13 participating local governments to establish an escrow account and make deposits into it so that their annual debt service obligations to WSPF was paid in early. A third level of enhancement was added with a local debt service reserve fund, which received contributions amounting to 5 per cent of the principal amount borrowed by each ULB. That account could be tapped in the event that revenues in the debt service escrow were not sufficient. A fourth layer of enhancement included the ability of the WSPF to intercept state revenue transfer payments.

The WSPF helped to spread credit risks by pooling the ULBs' resources to meet funding requirements for market access, thereby benefiting from economies of scale. The structure of the operation allowed the achievement of a high AA rating. Interestingly, the proceeds from the pooled bond issuance were disbursed to ULBs in 2003, and the majority went to refinance outstanding loans at lower interest rates for previously completed water and sanitation projects.

5.3 Vietnam: local development infrastructure funds

Local development infrastructure funds (LDIFs) are special subnational finance institutions created at provincial level to mobilize capital and invest it in the municipal infrastructure projects of each province. In Vietnam, LDIFs were first piloted in Ho Chi Minh City in 1997, and were then regularly improved and updated according to the evolving legislation, new priorities established by central and local authorities, and the possibility of co-financing between LDIFs. LDIFs are expected to operate as commercial-oriented entities, raising medium- and long-term capital from domestic and foreign sources and investing in municipal infrastructure projects that will generate a sufficient financial return on investment. LDIFs are statutorily restricted to financing revenue-generating municipal infrastructure in their respective provinces. This is of course a significant limitation in LDIFs, which cannot be used to finance the provision of pure public goods, even when cost recovery fees are introduced, typically in sectors such as education and health. In Vietnam, the LDIF model has expanded to 36 of the 63 provinces, mobilizing capital for infrastructure investment. Despite the coordination problems that characterize many municipal development funds, as noted in Section 4, funding commitments have grown from 40 million US dollars to approximately 144 million US dollars as of February 2015. According to World Bank internal reporting, as of March 2015, each dollar invested by LDIFs leveraged 1.73 US dollars in investment from the private sector. LDIFs have proved to be an important financing channel in Vietnam.

5.4 The Philippines: Kalahi-CIDSS (KC) Community-Driven Development (CDD) Project

The Kalahi-CIDSS (KC) Community-Driven Development (CDD) Project is a fund that aims to reduce poverty, improve participatory local governance and empower communities. In little more than a decade, from 2003, it received financing and support from the Government of the Republic of the Philippines, the World Bank, the US Millennium Challenge Account, and local governments and communities, for a total of roughly 400 million US dollars; this included a 30 per cent contribution to project costs from local governments (region,

municipality and/or *barangay*, villages). KC aims to improve welfare in rural areas by targeting communities with a poverty incidence greater than the national average through small-scale, community-driven development, sub-projects aimed at addressing their most pressing needs. Each participating municipality is allocated approximately 450,000 Philippine pesos (about 11,250 US dollars) times the number of villages in the municipality. Teams composed of *barangay* resident volunteers develop proposals for infrastructure and services to meet poverty reduction goals. Proposals are then evaluated by individual municipalities. Representative teams from each *barangay* in the municipality vote for which sub-projects are the most deserving of funding; the funds are then designated to each *barangay* according to its ranking in the voting until the municipal allocation is used up. Procurement and all other project-related activities are carried out directly by the community. As of June 2018, the project trained community volunteers in more than 3,000 villages to address self-identified development needs, and financed more than 4,000 public infrastructure sub-projects.

5.5 Democratic Republic of Congo (DRC) – STEP 2 Eastern Recovery Project

The current level of vulnerability is unprecedented in DRC's history and jeopardizes peace-building and development efforts. Despite formidable challenges, the country experienced its first peaceful transfer of power in 2019 and has engaged in a series of pro-poor policies to increase its resilience and that of its population. STEP 2 is a government project financed by the World Bank with 445 million US dollars, which builds on successful projects including its predecessor STEP 1 and the UK Department for International Development-financed £90 million Tuungaane series of projects. Tuungaane showed that community-driven approaches to local infrastructure produce higher quality, physical endurance, stronger ownership and better maintenance with regard to the schools and health centres built by the project. Component 1 of STEP 2 finances the maintenance, rehabilitation and construction of socio-economic local infrastructures in more than 1,000 targeted communities in DRC. The infrastructures are selected through a bottom-up approach, but focusing exclusively on education, health, and water and sanitation. The component also

supports local governance through Local Development Committees. Other project components include labour-intensive public works, cash transfers, productive inclusion, capacity-building to improve the country's systems and policies with targeted institutional reforms. This multisector and comprehensive approach aims to build long-term resilience in DRC, one of the most vulnerable regions of the world. It also aims to strengthen the engineering, construction and final use of the infrastructure while improving governance arrangements.

Policy recommendations and conclusions

Previous sections have discussed how investment in local infrastructure can help recovery from the COVID-19 pandemic by increasing long-term growth and welfare in a sustainable way. At the same time, it has uncovered a number of critical issues to be taken into account in order to invest effectively and efficiently in local infrastructure. The examples given show that these mostly relate to governance and financing, and that addressing them is a complex, lengthy and multi-stakeholder exercise. In concluding our analysis, we summarize our views around six policy principles that should always be followed when devising an effective policy for local infrastructure investment.

Maximize people's welfare in the long term

Any community has comparative advantages in performing some tasks, but not all communities are able to fully and efficiently exploit them. When planning local investment projects, decision-makers must consider the potential of local communities and their dynamic comparative advantages, together with their existing endowments.[85]

Local infrastructure investments should aim to allow all communities to use their individual strengths, fostering the accumulation of human capital and knowledge to overcome lock-ins and poverty traps, and to progress towards a long-term growth path. Investments in economic and social infrastructures

85 Gene M. Grossman and Elhanan Helpman, "Trade, Knowledge Spillovers, and Growth", in *European Economic Review*, Vol. 35, No. 2-3 (April 1991), p. 517-526, https://doi.org/10.1016/0014-2921(91)90153-A.

can help to uncover unused potential in lagging areas, contributing to human capital development, innovation, entrepreneurship, and labour- and product-market competition. This can enhance growth at both local and national level.[86]

Local infrastructure investments should help communities to recover from the effects of negative exogenous shocks, including those caused by the COVID-19 pandemic, and those that will likely be caused by climate change. At the same time, the heterogeneous impact of projects on different classes of population must be carefully assessed, so as to provide adequate compensations.

Listen to local communities

Supporting the long-term prosperity of local communities implies that they must have a say in the infrastructure they want: they must be empowered in the decision process. All local stakeholders must therefore play a part, according to a bottom-up approach that is crucial in guaranteeing the relevance and effectiveness of local infrastructure investments. Moreover, local participation by community members can ensure the sustainability of local infrastructure. Some level of contribution from communities, in forms that vary from money to in-kind contributions, can guarantee stronger ownership, care and maintenance of the infrastructure.

At the same time, local priorities must not create obstacles to larger, global projects if they will foster growth and increase aggregate welfare. On the contrary, local and national decision-makers need to find a balance between global and local needs while seeking consensus with neighbouring communities on local infrastructure investment. In particular, not-in-my-backyard requests following investment decisions should be addressed from a comprehensive national and international perspective and through a system of compensation, thereby mitigating the possible local negative effects of the investments. That is why it is crucial to establish an effective coordination between the different stakeholders and at the appropriate decision level.

86 Thomas Farole, Andrés Rodríguez-Pose and Michael Storper, "Cohesion Policy in the European Union: Growth, Geography, Institutions", in *Journal of Common Market Studies*, Vol. 45, No. 5 (September 2011), p. 1089-1111, https://core.ac.uk/download/pdf/216348.pdf.

Key insights in this respect come from the debate on local and regional development policies.[87] Regional interventions must not lead to a sub-optimal or inefficient allocation of resources, crowd-out private investment, shelter regions from markets and a dependency culture, or ultimately leave local communities vulnerable to falling back into decline once public funding dries up. To this aim, policymakers should limit their action to address negative externalities, encourage local communities to mobilize their own assets and resources, promote innovative business practices and rely on a robust regulatory framework.

Address market failures

Markets often fail to provide adequate investment in local infrastructure for various reasons, including free riding in the use of public resources; lack of coordination and of transparency in planning and carrying out a project; uncertainty on future returns; high fixed organizational, legal and administrative costs; weak or absent long-term commitment to the project; and lock-in arrangements that hinder the ability of communities to achieve autonomous long-run sustained growth.

These factors are the reason why private investors shy away from local infrastructure investments. However, while public policies need to address market failures, governments can fail too, because of inefficiencies and distorted incentives.

Thus, a balance between public and private presence is critical to foster local infrastructure investments; public policies should therefore be limited to addressing market failures and avoid crowding-out private initiatives.

Screen ex-ante and evaluate ex-post

Sound economic policies are based on careful analysis. Ex-ante data collection to assess the gap in local infrastructures is a prerequisite of any policy. Creating

87 Andy Pike, Andrés Rodríguez-Pose and John Tomaney (eds), *Local and Regional Development*, cit.

a framework to collect data on existing infrastructure and its maintenance is therefore one of the most effective investments than can be devised. Hence, efforts need to be made to enhance cooperation so that a standardized methodology can be devised for the assessment of infrastructure investment needs.

Once a clear picture of what is available is gathered, all options must be considered before making a new investment decision. For example, congestion problems can be addressed by building new roads, railways or cycling routes, or even by moving offices closer to where people live: all these options should be considered and compared by decision-makers, together with the option of upgrading and renovating existing facilities, which may be a more effective strategy than making a greenfield investment.

Finally, a set of indicators to evaluate investment performance should be decided ex-ante, covering a broad range of aspects that range from economic efficiency to environmental sustainability. The ex-post overall performance should then be compared with the final costs, to allow clear accountability in all phases of the project cycle, from planning to execution and management.

All this requires increased investment in local capacity; standardized financial arrangements based on best practice and a clear framework of environmental, social and fiduciary safeguards, including level playing field requirements.

Improve governance, foster coordination

Governance arrangements to manage local investment need significant support. New forms of interaction and collaboration between citizens and state are being developed to ensure full transparency and participation during an infrastructure investment's entire life cycle. Balanced and transparent participation in the governance arrangements of major local stakeholders and the private sector is also required, as it adds to their technical expertise, ensures due diligence and creates political consensus.

Local infrastructure investment projects must be coordinated vertically with national government and if needed with supranational organizations, and

horizontally with neighbouring subnational governments and across sectors.

Coordination ensures that duplications and potential conflicts are avoided or reduced, and that all potential synergies are fully exploited. Small-scale infrastructure projects should be planned within the broader framework of a national agenda, creating positive externalities in both directions: from the local to the national scale, and vice versa. At the same time, coordination must be sought in both directions: subnational projects must find their coherence within the broader framework of the national agenda, while the national agenda must also consider local priorities.

Focus on long-term effects

Local infrastructure is not a goal but a means to achieve long-lasting impact. When faced by negative shocks, such as the COVID-19 pandemic, most authorities tend to distribute their effects inter-temporally. This can easily lead to increasing public debt at the expense of future generations. Expansionary fiscal policies are the appropriate response to the short-term effects of a crisis, because they exploit their well-known multiplicative impact. But if implemented through effective infrastructure investments, expansionary fiscal policies can also have a substantial long-run impact. The opposite is not always the case: while any investment in local public infrastructure has a positive short-run effect on GDP, only those investments that efficiently address sound economic needs have a long-run impact. A careful ex-ante cost–benefit analysis is therefore required to verify that increases in public debt are justified by positive long-term effects. Following the basic quality infrastructure investments principles, it is possible to avoid building "white elephants" or "bridges to nowhere", which often have short-term benefits as their only objective.[88]

At community level, investments in local infrastructure, capable of improving the quality of services and enhancing social inclusion and cohesion, can have a positive impact on growth and welfare, leaving a solid legacy for future

88 G20, Principles for Quality Infrastructure Investment, cit. See also International Monetary Fund, "Making Public Investment More Efficient", in *IMF Policy Papers*, 11 June 2015, https://www.imf.org/en/Publications/Policy-Papers/Issues/2016/12/31/Making-Public-Investment-More-Efficient-PP4959; Gerd Schwartzet al. (eds), *Well Spent*, cit.

generations. Indeed, a renewed legacy may be needed to rebuild the social contract between state and citizens, which has been depleted in recent years. This has been compounded by the COVID-19 pandemic, which hinges on structural gaps in local infrastructure and public service delivery, and has exacerbated differences among and within countries, in particular between those regions with stronger networks of local infrastructures and those without. Since the correlation between access to local infrastructure/services and poverty level is strong, the impact of the COVID-19 pandemic remains asymmetric and regressive in nature.

Consistent with a long-run view, policy interventions should focus on fostering investment in projects that contribute to achieving the United Nations' SDGs and reduce poverty, increase shared prosperity and protect the environment.[89]

This choice is unavoidable, rational and fair. It is unavoidable, because climate change is the largest foreseeable risk the world is facing. It is rational, because the costs of not tackling the effects of climate change far exceed those required to act now, through investments for mitigation and adaptation. And it is a fair choice, because we are not entitled to leave to future generations the enormous challenge of facing its potentially catastrophic effects.

89 UN General Assembly, *Transforming Our World: The 2030 Agenda for Sustainable Development*, cit.

Reviving and Reorienting Growth after the Pandemic: The Role of Local Infrastructure Investments

Many countries are shifting their policies from limiting the immediate economic impact of the COVID-19 pandemic to designing strategies that will revive long-term growth and will address systemic challenges, such as climate change and growing inequality. A key success factor will be the capacity to restart and reorient infrastructure investments at a time when public finances have shifted from capital to current expenditure and private investments have been held back by the uncertain course of the pandemic. The focus of this paper is on the role that local government can play in promoting infrastructure investments and transforming the problems that the crisis has highlighted into opportunities for sustainable recovery and social inclusion. The paper focuses on how to improve the enabling environment and the range of financial instruments that are available at subnational level. Local challenges are greater than those at national level because subnational authorities generally have more limited fiscal capacity and greater difficulty in attracting private investors. It also looks at specific experiences that can provide interesting insights on how to implement and finance infrastructure projects and it proposes a set of policy principles to promote effective investments in local infrastructure.

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