Vol. 46, No. 4 | pp. 455-596
December 2022 | Zagreb

ISSN: 2459-8860
https://doi.org/10.3326/pse.46.4

Institute of Public Finance

Public Sector Economics

4/2022

Public Sector Economics

4/2022

Vol. 46, No. 4 | pp. 455-596 | December 2022 | Zagreb

TABLE OF CONTENTS

Challenges of effective governance for sustainable development at subnational government levels: introduction to this thematic issue of Public Sector Economics

YAMINI AIYAR*
ROLF ALTER, Ph.D.*
LINDA BILMES, Ph.D.*

Guest editors' introduction
https://doi.org/10.3326/pse.46.4.1

* Yamini AIYAR
Centre for Policy Research, Dharma Marg, Chanakyapuri, New Delhi-110021, India
e-mail: yaiyar@cprindia.org
ORCiD: 0000-0002-4140-8665

Rolf ALTER
Hertie School, University of Governance, Friedrichstraße 180, 10117 Berlin, Germany
e-mail: alter@hertie-school.org
ORCiD: 0000-0001-6445-5299

Linda BILMES
Kennedy School of Government, Harvard University, 79 John F. Kennedy St, Cambridge, MA 02138, United States
e-mail: linda_bilmes@hks.harvard.edu
ORCiD: 0000-0002-0969-8092

PUBLIC SECTOR ECONOMICS
46 (4) 455–458 (2022)

The UN's Agenda 2030 and Sustainable Development Goals (SDGs), as well as the principles of effectiveness, accountability and inclusiveness they are built upon, have been rather challenging for national and even more so for subnational governments. The situation has usually been exacerbated by the inflexibility, complexity or political determents of many multi-level governance arrangements, which tend to limit action at lower levels. Unsurprisingly, there has been limited progress.

And yet subnational governments are on the front line of sustainability efforts, undertaking a wide range of initiatives, addressing such matters as responses to climate change (storm surge barriers, heat mitigation, water conservation, expanding tree canopies, public transit, bike and electric vehicle policies, energy saving efforts and building codes). They are experimenting with a variety of financing tools to pay for these efforts, including issuing green bonds, public-private partnerships, state matching funds, as well as specific incentives, own-source taxes, fees, borrowing and regulations. In many cases these efforts require new levels of collaboration with other actors, such as community foundations and other civil society groups, voter approval and political leadership.

Institutional design for multi-level governance coordination to address sustainability challenges, whether in climate, public health, urbanisation, migration or other fields, requires subnational governments to work in close horizontal coordination with each other and vertically with national/federal governments. Designing institutions for horizontal and vertical coordination that play an appropriate mediating role might be crucial for governance, fiscal challenges and a whole-of-society approach to implementing the SDGs. Subnational governments are increasingly engaged in addressing the challenges raised by SDGs, driven by the urgency and scale of the consequences of inaction or increasing engagement or pressures from citizens. This may or may not have led to changes in governance, such as the institutionalization of greater horizontal cooperation or public-private partnerships.

The intention of this special issue of *Public Sector Economics* is to help finding out more about the above issues. How have subnational governments in countries around the world changed and adapted? What policy and implementation challenges have they faced? Which measures have they implemented? How? What are the policy implications and lessons learned?

Against this background, in late 2021 we launched a call for papers for this special issue of *Public Sector Economics* on challenges of effective governance for sustainable development at subnational government levels. From among the submissions, we selected five papers that provide a solid analytical background for discussions on the challenges of effective governance for sustainable development at subnational government levels. The papers cover a broad range of MLG arrangements. One common message of these contributions is the feasibility of progress provided there is creativity and commitment.

Christian Raffer, Henrik Scheller and Oliver Peters, in the article *The UN Sustainable Development Goals as innovation drivers for local sustainability governance?*

PUBLIC SECTOR ECONOMICS
46 (4) 455-458 (2022)

Examples from Germany provide a vivid example of how SDGs provide a useful framework for socio-ecological transformation favoured by the high degree of federalism and autonomy of cities. In their policy-oriented contribution, they focus on the question of whether the SDGs themselves are innovation drivers in local sustainability governance, motivating this idea with the theoretical framework of public sector innovation and providing comprehensive examples of the most prevalent current approaches to SDG-related innovations at the German local government level, covering local government sustainability reporting, strategies, budgets, and financing. They emphasize that a small group of early-innovating German local governments has already begun to govern sustainability with the help of SDG-driven innovations and that this became possible by publicly funded support projects and accessible pre-defined localised SDGs.

Sean Dougherty and Andoni Montes Nebreda in the article *Going global, locally? Decentralized environmental expenditure and air quality* claim that despite the importance of the role of intergovernmental institutions for the overall success of SDG objectives, there is still limited progress at the regional and local levels, due to imperfect institutional capacity and doubts about the electoral consequences that unevenly distributed costs may generate. Consequently, they use panel data for the 2010 to 2019 period covering 217 metropolitan areas of OECD European countries, as well as consolidated COFOG environmental expenditure data, and find that subnational public spending on environmental protection is associated with better municipal air quality to a larger extent than environmental expenditure made by all levels of government. Indeed, environmental spending shows a strengthened link with reduced air pollution exposure through the mechanism of higher institutional quality. Finally, higher income per capita and more tree cover are also determinants of lower exposure to air pollution in metropolitan areas.

Mohammed Aminu Yaru in the article *Budget transparency and internal revenue mobilisation at subnational government level: evidence from Nigeria* examines the hypothesis that improved budget transparency leads to greater revenue mobilisation. The study adopts both cross-sectional and panel regression analyses based on data for 2015, 2018 and 2020. The findings suggest that the hypothesis that improved budget transparency improves revenue mobilisation cannot be rejected, but population density (urbanisation), poverty and unemployment are the dominant factors that explain revenue mobilisation by the state governments in Nigeria. The study also reiterates the need to control corruption in order to make sustainable progress in revenue mobilisation at sub-national level.

Marko Primorac, Jorge Martínez-Vázquez and Pedro Arizti in *Achievements and unfinished agenda of the fiscal equalization system in Croatia* explain how the revenue sharing arrangements and the fiscal equalization system in Croatia have long been perceived as inadequate and ineffective. The reform of the personal income tax sharing implemented in 2018 was accompanied by a new fiscal capacity equalization system. To date the effects of these reforms have not been empirically analysed. In addition, the impact of omitting differences in expenditure

PUBLIC SECTOR ECONOMICS
46 (4) 455-458 (2022)

needs in the new formula has not been adequately analysed either. The authors try to fill those gaps by analysing the existing disparities in fiscal capacity and expenditure needs across subnational governments in Croatia, as a test of the effectiveness of the current fiscal equalization mechanisms. Using Gini coefficients and other measures of inequality they confirm that the new fiscal equalization does reduce disparities in per capita fiscal capacity. However, the equalizing effectiveness of the current equalization grant system regarding expenditure needs arising from decentralized functional responsibilities is overall rather weak.

Nejc Brezovar and Tatjana Stanimirović in the article *Sustainability aspect of participatory budgeting at the municipal level in Slovenia* discuss the Local Self-Government Act which has since 2018 left decisions on participatory budgeting funding, on who can propose and vote on projects, and how, on the nature of proposed and implemented projects as far as they fall under municipal authority and under the public finance rules to the discretion of municipalities. The article reveals that a soft legislative approach resulted in only 30 (out of 212) municipalities being at some time, in period 2015-2021, engaged in such projects, averaging up to one percent of total budgetary expenses for participatory budget purposes, mostly for inclusive, people-centred projects promoting facilities for socializing and public infrastructure capacities (e.g. sports), in line with the municipal social sustainability agenda promoting equality and diversity, social cohesion, democracy and governance, and quality of living.

In conclusion, Dagmar Radin reviews the United Nations World Public Sector Report 2021: *National institutional arrangements for implementation of the Sustainable Development Goals: A five-year stocktaking* which focuses on the national institutional arrangements in twenty-four countries and the evaluation of the progress made since the beginning of the implementation in 2016. It takes into consideration the challenges set forth by the COVID 19 pandemic and its effects on the ability of public institutions to respond while upholding the principles and adjustments needed for the achievement of the SDGs, dealing particularly with: the evolution of institutional arrangements for SDG implementation; the development and performance of monitoring and evaluation systems for the SDGs; and evaluation of the efforts made by governments and other stakeholders to boost public servants' capacity for SDG implementation.

As the guest editors of this special issue, we would like to thank the authors for submitting these interesting and analytically rich papers and for their cooperation during the peer-reviewing process. We are also grateful to the reviewers for their patient reading and rich and helpful feedback, and to the team from the Institute of Public Finance for offering us this opportunity. Not only as the members of the United Nations Committee of Experts for Public Administration (CEPA) but also as all other ordinary citizens of the world, we can only hope that this thematic issue might contribute to the further consideration and advancement of effective governance for sustainable development at subnational government levels and accordingly to the achievement of Agenda 2030 and the SDGs.

The UN Sustainable Development Goals as innovation drivers for local sustainability governance? Examples from Germany

CHRISTIAN RAFFER, M.Sc.*
HENRIK SCHELLER, Dr.*
OLIVER PETERS, M.Sc.*

Article**
JEL: H72, Q01, R51
https://doi.org/10.3326/pse.46.4.2

* The authors would like to thank the two anonymous reviewers for their very useful comments and suggestions.
** Received: February 28, 2022
Accepted: May 20, 2022

Christian RAFFER
Freie Universität Berlin, School of Business and Economics, Garystraße 21, 14195 Berlin, Germany, and
German Institute of Urban Affairs, Zimmerstraße 13, 10969 Berlin, Germany
e-mail: raffer@difu.de
ORCiD: 0000-0001-6594-6321

Henrik SCHELLER
German Institute of Urban Affairs, Zimmerstraße 13, 10969 Berlin, Germany, and
Freie Universität Berlin, Otto Suhr Institute of Political Science, Ihnestraße 22, 14195 Berlin, Germany
e-mail: scheller@difu.de
ORCiD: 0000-0002-8669-5063

Oliver PETERS
German Institute of Urban Affairs, Zimmerstraße 13, 10969 Berlin, Germany
e-mail: opeters@difu.de
ORCiD: 0000-0002-0051-4357

PUBLIC SECTOR ECONOMICS
46 (4) 459–487 (2022)

Abstract

Local governments are highly relevant for the just-starting socio-ecological transformation. Living up to this role requires new or adapted forms of governance. The German case provides a vivid example of how the UN Sustainable Development Goals (SDGs) provide a useful framework for this transformation. In our policy-oriented contribution, we focus on the question whether the SDGs themselves are innovation drivers in local sustainability governance. We motivate this idea with the theoretical framework of public sector innovation and provide comprehensive examples of the most prevalent current approaches to SDG-related innovations at the German local government level, covering local government sustainability reporting, strategies, budgets, and financing. Our central finding is that a small group of early-innovating German local governments has already begun to govern sustainability with the help of SDG-driven innovations and that this became possible because of publicly funded support projects and accessible pre-defined localised SDGs.

Keywords: sustainable development goals, local governments, public sector innovation, Germany

1 INTRODUCTION

The ongoing rise of temperature due to anthropogenic greenhouse gas emissions is one of the most fundamental threats to fragile eco and social systems. By 2017, human activities had led to global warming of approximately 1.0°C above pre-industrial levels (IPCC, 2018). Since the climate reacts sluggishly to the accumulation of greenhouse gases in the atmosphere, it is likely that the 1.5°C threshold will be crossed within the next twenty years and – with it – there will be increased climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth. Evolving knowledge about these consequences as well as an increasingly obvious degradation of the biosphere have made the preservation of ecology an essential part of our current understanding of sustainability (Fiorino, 2010). Combined with rising concerns that income and wealth disparities will be exacerbated (Piketty, 2014), it has also an imperative of modern western politics on all levels of government (Duit, Feindt and Meadowcroft, 2016)[1], famously framed as the great socio-ecological transformation (Blühdorn, 2020) that is lying ahead of us.

Today, limiting emissions to avoid an entirely dystopian future seems more important than ever (Reimer and Staud, 2021). However, since climate mitigation as part of broader sustainable development is complex and not a spontaneous social product, it needs strategic governance efforts from legislatures and executive institutions (Meadowcroft, 2007). The academic discussion about what effective governance of this transition may look like is at least three decades old and

[1] See, for example, the "European Green Deal" (Fetting, 2020) or the US "Green New Deal" (White House, 2020).

PUBLIC SECTOR ECONOMICS
46 (4) 459–487 (2022)

intrinsically linked to the question of which level of the state is best equipped to administer it (Evans et al., 2006). Although the relevance of national climate policies is unquestionable, there are plenty of good arguments in favour of local government involvement as well. Most straightforwardly, it is urban areas that are responsible for more than 70 percent of global energy-related carbon emissions (Otto et al., 2021; Rosenzweig et al., 2010). Taking the opposite perspective, cities are often built on riverbanks or coasts and are particularly vulnerable to climate change effects. A third argument is related to William E. Oates' idea of local governments' profound knowledge of citizen preferences (Oates, 1972). Local politicians take account of citizen demands and local governments can channel them (Evans et al., 2006). Hence, the local level should have a vital interest in climate mitigation and adaptation. At least since the 1992 UN "Conference on Environment and Development (Earth Summit)" in Rio de Janeiro, cities and local communities have been part of the sustainability discourse. Strategic and successful governance of complex issues such as sustainability, however, is a different story (Otto et al., 2021), revealing a broad spectrum of structural, cultural and attitudinal barriers in local governments. For instance, besides fundamental progress, rigid administrative structures and adequate and successful citizen participation were already a challenge in the Local Agenda 21 (LA21) processes (see, e.g. Schnepf and Groeben, 2019). Not least, complexity issues often become visible in large-scale construction projects like Stuttgart 21 or Berlin airport (see, e.g. Römmele and Schober, 2013).

Although public administration has a lot of experience in steering such processes (Meadowcroft, 2007), there is doubt that traditional local government structures are appropriately designed to handle complex and even wicked problems like climate mitigation characterised by disagreements concerning how to address them and difficulties in evaluating outcomes (Sørensen, 2012). The departmental organisation and processing of tasks with the typical segmented thinking are often considered dysfunctional with regards to the integrative problem and goal structure of sustainability issues and a traditional barrier to structural transformation (Bornemann and Christen, 2019; Fiorino, 2010). This critical perspective applies especially to states in the Weberian Rechtsstaat tradition (like Germany) where strict regulatory regimes dominate (Sørensen, 2012). This does not mean that in these countries no early-moving and adaptable local governments exist (see, e.g. Bulkeley and Kern, 2006). However, across the board, local government administration of the socio-ecological transformation requires a prior transformation of (local) public administration; this would consist of the adoption of new, and the change of the established, structures, procedures, cultures, and practices of internal governance (Bornemann and Christen, 2019).

An appropriate theoretical frame for this change is the concept of public sector innovation, which often proceeds by experimental trial and error – a process that usually is not very appreciated in traditionally risk-averse public administrations fearing media and opposition criticism of failures (Borins, 2001). Nevertheless, for

PUBLIC SECTOR ECONOMICS
46 (4) 459–487 (2022)

the last few years and in the face of the first perceptible climate change effects (local) governments' openness to move and to adopt new ideas and practices in their internal mode of working have become perceptible (see, for example, Bornemann and Christen, 2019). As a side note, this openness to internal structural and process innovation may be one of the most important differences compared to the Local Agenda 21 (LA21), which also led to intense local government thinking about sustainability following the Rio Conference in 1992, but was mainly based on external citizen participation and failed to provide long-term oriented outcomes (Xavier, Jacobi and Turra, 2019) or even an assessment of the success or failure of the many local initiatives (Graute, 2016). This leads to a situation in which even today there is still relatively little knowledge about concrete public sector innovation that addresses internal modes of sustainability governance (Bornemann and Christen, 2019). With this contribution, we target this research gap.

We understand innovation as an idea, practice, or object that is perceived as new by the unit of adoption, irrespective whether the organisation itself invented or just copies it (Rogers, 2003). Whenever public administration implements new policies and services, it is justified to speak of public sector innovation (Sørensen, 2012). In this context, the public-sector-innovation types of administrative process innovation, product or service innovation, governance innovation, and conceptual innovation are particularly relevant (de Vries, Bekkers and Tummers, 2016). Whereas administrative process innovation covers improvement in the quality and efficiency of internal and external processes (Walker, 2014), the creation of new public services and products is product and service innovation (Damanpour and Schneider, 2009). Governance innovation entails the development of new forms and processes to address societal problems like climate change (Moore and Hartley, 2008). Finally, conceptual innovation describes the introduction of new concepts and frames of reference (Bekkers, 2011). We argue that the diffusion of any public sector innovation depends on the applicability of these new but existing policy ideas and concepts, as well as upon public pressure and support from local decision makers. From this perspective, we hypothesise that comprehensible supranational standards which are easily translatable to the local government level work as innovation drivers. We further investigate the hypothesis that the United Nations Sustainable Development Goals (SDG), formulated in 2015, can be transferred to local governments and provide an all-encompassing concept with which to think about and to operationalise sustainable development.

In this article, we provide examples of the most prevalent current SDG-related public sector innovations in German local governments, covering topics like SDG-related budgeting, sustainability controlling and reporting, the formulation and implementation of indicator-based sustainability strategies, and local government financing. Our regional focus is on Germany since its highly regulated, fragmented and risk-averse administration is a good example for innovation scepticism in the public sector (see, for example, the below-average German performance in public service digitalisation: European Commission, 2021). Insights

PUBLIC SECTOR ECONOMICS
46 (4) 459–487 (2022)

regarding successful public sector innovation in such an environment are transferrable to other countries with more innovation-friendly local governments. The central result of our analysis is that publicly financed support programmes for municipalities and the provision of easily accessible localised SDGs can facilitate local sustainability governance and therefore support the implementation of public sector innovation in this field.

We structure this article as follows: in section two, we introduce the concept of SDGs for local governments followed by the theoretical basis and a summary of existing research about local government transition to sustainable development in section three. Section four takes a short detour on the institutional setup regarding German municipalities and discusses their openness towards innovation. Section five provides four examples of SDG-related public sector innovation in German local governments and in section six we summarise and discuss these innovations and draw policy lessons. Chapter seven concludes.

2 SDGs AND THEIR RELEVANCE FOR LOCAL GOVERNMENTS

The Agenda 2030 is the UN's first comprehensive set of political goals, identifying social, environmental and economic aspects of sustainable development in a balanced manner and targeting industrialised nations, emerging economies and developing countries equally. The 17 SDGs have been translated into 169 targets or sub-targets (Colglazier, 2015). They refer to substantive goals or address possible implementation paths including financial or structural measures and were formulated with the help of diverse stakeholder groups all over the world (Klopp and Petretta, 2017).

The Agenda 2030 is primarily a treaty among states. It was adopted in 2015 as key element of the United Nations' post-2015 development agenda; the SDGs are successors to the eight Millennium Development Goals which were the frame of reference from 2000 to 2015 (Colglazier, 2015). Although the SDGs focus on the central level, they also address municipalities. On the one hand, the local level is important for implementation: at least 105 of the 169 SDG targets will not be achieved without proper engagement of and coordination with local and regional governments (OECD, 2020). On the other hand, SDG 11 specifically addresses cities and municipalities (SDG 11: Sustainable cities and settlements – making cities and settlements inclusive, safe, resilient and sustainable). In general, SDGs provide a framework for the local level of government to align its priorities with the national and global levels.

Local implementation of the 2030 Agenda requires comprehensive municipal sustainability and transformation management (see, e.g. Gustafsson and Ivner, 2018; Tremblay et al., 2021). This includes, among other things, transferring the global goals to the local level, concretising them individually and mapping them by means of indicators (Fox and Macleod, 2021). However, the translation of the global goals and indicators to lower governmental levels with their very

heterogeneous structures and preconditions is a complex venture. There is often lack of support when it comes to concretising the SDGs with their, sometimes considerable, scope for interpretation. No less complicated is finding or developing suitable indicators and small-scale data sets. Another challenge is that many local governments lack the resources to administer the transformation.

However, numerous municipalities in Germany and beyond have already been dealing with local sustainability processes for some time. One central starting point was the Agenda 21, which was adopted by the United Nations' Rio conference in 1992. It found its way into the cities, municipalities and counties as Local Agenda 21 (LA21) under the motto "Think globally – act locally" (Evans et al., 2006; Xavier, Jacobi and Turra, 2019). Further milestones for a stronger involvement of German municipalities in sustainability management were the Aalborg Charter (Zilans and Abolina, 2009), the adoption of the UN Millennium Development Goals (UN, 2015) and the first German Sustainability Strategy in 2002 (Bundesregierung, 2002). In addition, many municipal sustainability processes in Germany originated from the initiative of citizens and were mainly driven by their voluntary commitment.

For some years now, a growing number of municipalities has channelled existing commitment into municipal sustainability strategies and concepts (see section 5.3.). However, the depth of development varies considerably: while some municipalities focus on exemplary sustainability measures, others also define comprehensive mission statements and goals, or goal systems, and regularly review the degree of goal achievement. One important contribution is made by the so-called "Club of Agenda 2030 Municipalities". This club comprises cities, municipalities and districts that have signed the model resolution "2030 – Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions (Lange et al., 2020). By signing the resolution, municipalities commit themselves to supporting the SDGs on the local level in one way or another. Moreover, they become members of a network with many options for capacity building by interaction. Participating municipalities can engage in three focus areas: raising awareness, networking, and transferring the Agenda 2030 to the municipal level. As of September 2021, 190 German cities have signed this resolution.

While the Club of Agenda 2030 Municipalities is the only explicit German network dedicated to the implementation of the SDGs at the municipal level, there are numerous other networks and programs supporting municipal sustainable development in Germany. For example, the German Council for Sustainable Development (RNE) has launched the "Sustainable City" dialogue between the mayors of over 30 German cities, which publishes statements, joint position papers or more detailed "roadmaps" on municipal sustainability policy.

All of this shows that there are local governments in Germany that do actively support the implementation of SDGs. However, these numbers need to be put into

PUBLIC SECTOR ECONOMICS
46 (4) 459–487 (2022)

perspective. Overall, there are about 10,796 German municipalities (31 December 2020) and 294 districts: 190 committed Club of Agenda 2030 cities, municipalities, and districts make a rather small share. From survey research we know that in 2018 decision-makers in most German local governments considered the SDGs hardly important for their administration and even in large cities with more than 100,000 inhabitants (of which there were 80 in 2020) only a quarter called the SDGs "important" (Haubner et al., 2018). Although this may have changed since 2018, the implementation of the SDGs on the local level in no way constitutes a mass movement. Therefore, highly relevant questions are how SDGs trigger innovative public sector processes that support the socio-ecological transformation and what factors support and hinder their diffusion.

3 THEORETICAL FOUNDATION AND LITERATURE

Each transformation is a fundamental form of societal, systemic, or organisational change (Heyen and Brohmann, 2017; Polanyi, 1944). Whereas the notion of socio-ecological transformation refers to a large-scale societal and technical change, sustainable urban transformation focuses on structural processes that can effectively direct urban development towards sustainability goals (McCormick et al., 2013). Similarly, local government (sustainability) transformation as we understand it is more a story of organisational change (Fernandez and Rainey, 2006) and public sector innovation (Sørensen, 2012) that enable public organisations to manage the socio-ecological transformation. As soon as a (local) government implements an idea or practice, concept or policy that is perceived as being new, we speak of public sector innovation, irrespective of whether the organisation itself invented or just copies it (Rogers, 2003; Sørensen, 2012; de Vries, Bekkers and Tummers, 2016).

Currently, cities and municipalities face numerous complex challenges which require new and innovative modes of strategy-formulation, internal structures, processes, and controlling (Bornemann and Christen, 2019; Miller, 2005). These innovations are always accompanied by institutional learning and capacity-building efforts (Evans et al., 2006; de Vries, Bekkers and Tummers, 2016). To name just a few of these challenges: decarbonisation, energy efficiency, urban climate mitigation/adaptation, mobility and transport, as well as urban planning – all under the consideration of social equality and public health (Rink and Kabisch, 2017; McCormick et al., 2013, and others).

Linking sustainability-induced public sector innovation with the widely discussed framework of governance implies that the topic not only requires multi-level governance (Fenton and Gustafsson, 2017; Krellenberg et al., 2019) but also that governance itself has to be adaptive. Since governance for sustainable development covers policy formation and implementation, as well as stakeholder interaction, and since – at the same time – the modes of these processes have to change, the governance system itself is also under transformation. This is what Meadowcroft (2007) and others call "reflexive governance". Many authors explored the concepts of governance and sustainability and tried to identify interactions and key themes

(Meulemann, 2018; Jordan, 2008; Kemp, Parto and Gibson, 2005; Meuleman and Niestroy, 2019; van Zeijl-Rozema et al., 2008). Whereas Meadowcroft (2007) has put a special focus on the management of change in systems of fragmented power, Bartle and Leuenberger (2006) as well as Fiorino (2010) concentrated on the applicability of sustainable development for public administration.

In a similar vein, another strand of literature covers the strategic and management perspective of sustainable development strategies on the national level in the aftermath of Rio 1992 (Lafferty and Meadowcroft, 2000; Steurer and Hametner, 2013; Steurer and Martinuzzi, 2005; Volkery et al., 2006). Bruyninckx, Happaerts and van den Brande (2012) focus on intermediate level governments in federal countries. From the very beginning, there was also an increased research interest in the implications of sustainable development for local governments, especially in terms of the LA21 implementation but also of the more specific local action fields of climate mitigation and adaption. Since the 1990s, researchers have worked on local government climate mitigation activities, mostly based on case studies (for an overview, see Bulkeley, 2010). In terms of local sustainable development, Evans et al. (2006) analysed institutional and social preconditions. Among other things, the authors stress the importance of civil society activity and the need for a strategic long-term vision of a sustainable future. Feichtinger and Pregernig (2005) analysed local LA21 implementation and drew conclusions in terms of normative tensions between democratic participation and sustainability goals. Although even today this discussion provides meaningful insights into local government sustainability governance, authors like Graute (2016) or Xavier, Jacobi and Turra (2019) conclude that the LA21 process has failed to provide long-term results and has not been followed by appropriate efforts at evaluation.

After three decades of local sustainability governance, the phenomenon seems to have finally reached a certain proliferation. For the last few years, it has been possible to observe more and more empirical research that investigates local climate mitigation and adaptation from an even international perspective. Whereas Otto et al. (2021) rank large cities in Germany according to the quality of mitigation and adaptation strategies, Araos et al. (2016) take a global perspective and find that only 15 percent of 401 cities with more than one million inhabitants have formulated adaptation plans. The most ambitious cities are concentrated in high-income countries. Grafakos et al. (2020) focus on the interaction between mitigation and adaptation strategies in 885 European cities. This more recent literature shifts the perspective to the quality of action plans and the interplay of mitigation and adaptation.

Irrespective of the level of government, the use of indicator-based governance has always been a core topic. In their early volume "In Search of Indicators of Sustainable Development", Kuik (1991) and Verbruggen stated that "unless there is some clear measure or at least some indicator of sustainable development, the effectiveness of environmental or other policy towards this goal cannot be assessed" (p. 1), which reflects a timeless truth. Going beyond the huge literature

PUBLIC SECTOR ECONOMICS
46 (4) 459–487 (2022)

on the technicalities of indicator building and indicator sets (see, e.g. Bell and Morse, 2008; Ameen and Mourshed, 2019; Böhringer and Jochem, 2007 and many others), authors like Holman (2009) and Miller (2005) analysed the role of indicators for local sustainability governance and Holden (2011) asks about the relevance of citizen participation in choosing appropriate sets.

Closely related to the question of indicator-based monitoring is local government application of SDGs. Although the UN published the SDGs only seven years ago, academic discussion about their potential for local governments is still new and in many cases conceptual (see, e.g. Fenton and Gustafsson, 2017; Graute, 2016; Kharrazi, Qin and Zhang, 2016; Klopp and Petretta, 2017; Zinkernagel, Evans and Neij, 2018) or based upon case studies (Fox and Macleod, 2021; Hansson, Arfvidsson and Simon, 2019; Krellenberg et al., 2019; Tremblay et al., 2021; Villeneuve et al., 2017). An exemption is the study by Kawakubo et al. (2018) who apply an SDG-based tool to assess the sustainability level of 79 cities worldwide. Not very surprisingly, the authors find that general SDG-based sustainability as well as greenhouse-gas emissions are higher in developed countries.

In sum, the literature presented in this section, which covers local governance of sustainable development and climate mitigation/adaptation, provides many valuable and detailed insights into how to administer the upcoming socio-ecological transformation. Just a few rough and by no means comprehensive brush strokes: additional to effective citizen participation and multi-stakeholder engagement, a strategic plan with adequate targets as well as appropriate local government structures and interdepartmental processes seem to be crucial. Monitoring success and enabling local governments to steer the transition require data-based indicators of sustainable development. It is not only indicators and targets (like the SDGs) that have become a "key site of innovation", as Miller (2005) puts it. In the face of these changes, the entire socio-ecological transformation opens a wide field for public sector innovation.

4 INSTITUTIONAL BACKGROUND: LOCAL GOVERNMENTS IN GERMANY AND THEIR OPENNESS TOWARDS INNOVATION

Germany has 10,796 municipalities (31 December 2020), including 1,210 joint municipalities ("Gemeindeverbände") which pool the public services of 7,608 smaller municipalities (Destatis, 2022). Around 51 percent of all Germans live in 2,254 small and medium-sized towns (from 5,000 up to 19,999 inhabitants). Another 681 cities have a population between 20,000 and 499,999 people, and only 14 cities have more than 500,000 inhabitants (Statista, 2022). Municipalities and joint municipalities in Germany are usually part of one of the 294 counties ("Landkreise"). Only 107 cities are autonomous in the sense that they do not belong to a county.

German administration is regarded bureaucratic, bound to the administrative tradition, and fragmented (Jann, 1983). Its historical tradition reaches back to the Prussian state reforms between 1807 and 1815, which established the central structural

features. These exist even today and were systematically described by Max Weber in his analysis of the "bureaucratic administration" (Weber, 1972). According to Weber, administration may act only on a legal basis in form of positive administrative law ("Weberian Rechtsstaat"). The strong departmental principle ensures that administration is based on the division of labour among various specialised branches. Despite their firm integration into a hierarchy, these departments have clearly defined competences. Another cornerstone is the regularity of records and the written documentation of decision-making processes. Even today, the rule of law is the central guiding principle: the general contestability of administrative decisions makes it necessary for administrative law and corresponding administrative practice to be as court-proof as possible (Jann and Wegrich, 2008: 51).

These characteristics point to possible challenges that administration faces when multidimensional/wicked problems are to be solved since these often affect various departments simultaneously and therefore require horizontal collaboration (Scharpf, Reissert and Schnabel, 1976). Thus, the departmental principle tends to be an obstacle to collaborative, process-oriented and agile problem solving. Not without reason, the introduction of New Public Management (NPM) has been implemented only partially in many German municipalities (Holtkamp, 2009). Since NPM was a global wave of public sector innovation this shows nicely that not only collaborative solutions but also the implementation of innovations is limited by the risk-averse and rule-of-law focused German administration. Implementing the SDGs requires two major steps that could reinforce those barriers: integrating the SDGs in a sustainability management system (operationalisation), which includes strategy, measures and monitoring development, as well as translating the SDGs into the local context (localisation) (see, e.g. Krantz and Gustafsson, 2021). The latter means adapting targets and monitoring to local conditions, such as access to the sea, and local specifics, such as connectivity to metropolitan areas.

Since municipalities in Germany are not an independent jurisdictional level of government but assume administrative tasks from higher levels of government, they are in a cliff-hanging situation between policy-making and administrative enforcement obligations. Municipalities have two types of tasks: voluntary self-governing tasks (culture, sports, economic development, and climate protection) and compulsory tasks. The latter can be grouped into compulsory self-government tasks, compulsory tasks according to instructions, and contract matters (Dreier, 2006). Obligatory self-government tasks include wastewater disposal, school transportation, fire protection, construction and maintenance of school and administrative buildings, and municipal roads. Although municipalities are obliged to perform these tasks, they are free to decide how to do so. Mandatory tasks according to instructions include security and public order as well as reimbursement of the costs of housing and heating as part of the social welfare system. These are subject to legal and technical supervision of the Länder – similar to commissioned matters, which include, for example, passport and registration services, registry, health, and veterinary offices. Here, municipalities act as decentralised administrative bodies of the federal and state governments.

PUBLIC SECTOR ECONOMICS 46 (4) 459–487 (2022)

Following the Basic Law, municipal self-government includes basic financial autonomy. For example, local governments have the right to levy certain taxes like business or property tax. Since the number of non-voluntary tasks has risen steadily over the past decades, voluntary tasks are always subject to funding – especially in financially weak municipalities. Since climate protection and sustainability activities are voluntary, financial restrictions often limit municipalities' ability to govern sustainability. Another obstacle is the complex corporate structure of many local governments. Over the past decades, cities and municipalities have corporatised many cost and emission intensive public services related to infrastructure (public transport, wastewater management, energy supply, etc.). These fragmented corporate structures can also complicate integrated and cross-city climate and sustainability programs.

5 EXAMPLES OF SDG-RELATED PUBLIC SECTOR INNOVATION IN GERMANY

5.1 THE GERMAN LOCAL GOVERNMENT SDG PORTAL AND SDG-RELATED SUSTAINABILITY REPORTING

As more and more local governments in Germany think about sustainability governance and an appropriate formulation of targets, the localisation of SDGs is an increasingly relevant topic among practitioners and scholars. A central German institution for this discussion is the working group "SDG Indicators for Municipalities", founded in 2017 (Bertelsmann Stiftung, 2022). It brings together research institutes, the three German local government associations, federal government and NGO representatives as well as representatives from the Council of European Municipalities and Regions (CEMR). Thus far, this working group has published two reports which specify SDGs for local governments (Bertelsmann Stiftung, 2018, 2020). The latest report assigns 120 indicators to the 17 SDGs. Fifty-six of these are of type I, meaning that they are of high reliability and data on the district and/or municipal level are available for the whole of Germany. For type II indicators, data availability is not as comprehensive. The set of indicators is meant to be a toolkit for municipal application.

For the more than 3,000 German cities, towns and districts with more than 5,000 inhabitants, data for type I indicators are available in different data portals. One of these is the "SDG portal"[2] that was developed by the above-mentioned working group "SDG indicators for municipalities". It aims at facilitating SDG monitoring at the municipal level. The portal was awarded the UN SDG Action Award (Top 3) at the SDG Global Festival of Action of the United Nations in Bonn in 2018 and transferred to Italy in 2020[3]. Currently, the working group is planning further scaling to other European or Non-European countries with the long-term aim of enabling cross-national comparisons.

[2] Available at: www.sdg-portal.de.
[3] Available at: https://sdg-portal.it/it.

The provision of this easily accessible tool aims at enabling local governments to embed SDGs into their sustainability governance, which often comprises sustainability strategies, projects, structural and financial resources as well as monitoring and reporting systems. These localised SDGs are proposed to be of special use for sustainability reporting (Bertelsmann Stiftung, 2020). Following internal numbers of the Bertelsmann Stiftung, which is the central institution behind the portal, 75 municipalities from a population of 271 highly ambitious model communities[4] published sustainability reports between 2017 and 2021. Of these 75 municipalities, 40 have integrated sustainability indicators in their reporting and 33 out of these 40 municipalities used localised SDGs. On the one hand, this indicates that even among a group of highly ambitious German cities and municipalities only a minority offers (up-to-date) sustainability reports. On the other hand, however, it also indicates that cities or municipalities in Germany, which published indicator-based sustainability reports in the recent past, most often use localised SDGs.

Several cases indicate that the SDG portal facilitates localised SDG reporting. One example is the city of Freiburg in Baden-Wurttemberg (Freiburg, 2020). So far, the city has published four sustainability reports. The latest report in 2020 listed 59 sustainability targets monitored with 78 indicators; 28 came directly from the SDG portal. The city of Stuttgart follows a similar approach (Stuttgart, 2021) and Mannheim (both in Baden-Wurttemberg) published information regarding its own SDG performance in 2018 using the very data (Mannheim, 2018). Other cities/municipalities provide direct links to the SDG portal on their webpage to communicate their current sustainability level to interested citizens. Examples are the city of Eltville in Hesse (Eltville, 2017) and the city of Lahr in Baden-Wurttemberg (Lahr, 2021). This indicates that the online portal allows localised SDG reporting even for smaller cities, which may not have the resources to publish and update comprehensive sustainability reports.

One further prominent feature of the SDG portal is the option to benchmark. Although there is currently no information about how many local governments apply SDG-related sustainability benchmarking, recently two online market places for local government finance have integrated the portal to provide investors with the opportunity to evaluate sustainability levels of local governments (see section 5.4). This indicates that the potential use of this tool goes beyond mere local government sustainability reporting, which is already an innovation on its own for most local governments, and opens a new field for public sector innovations.

[4] A model community is a city or a municipality which has shown a high level of ambition in terms of sustainability by being affiliated to one of the following initiatives: Club Agenda 2030 (see section 2), Global Nachhaltige Kommune (see section 5.3), finalists of the German sustainability price for cities and municipalities, award-winning municipalities at the "Zeitzeichen N" award, model municipalities of the competence centre "Education – Sustainability – Municipality", in the national development report of the New Urban Agenda, and in the Bertelsmann Foundation project "Monitor Nachhaltige Kommune" and the follow-up project "Agenda 2030 – Nachhaltige Entwicklung vor Ort".

PUBLIC SECTOR ECONOMICS 46 (4) 459-487 (2022)

5.2 SDGs AND LOCAL GOVERNMENT BUDGETS

In the light of limited financial resources, the question of how local governments can link their budgets to sustainability governance is becoming increasingly relevant. This is why the instrument of "sustainability budgets" was developed (LAG, 2021) and – so far – tested in a group of municipalities in North Rhine-Westphalia, Germany's most populous state. This group comprises Cologne (Stasiowski, 2018), Bonn, Lüdenscheid, Jüchen, and the county of Unna (LAG, 2021; Schuster, 2019). The first city to experiment with sustainability-related budgeting was Freiburg.

The purpose of sustainability budgets is to align the allocation of municipal financial resources with sustainability objectives, which in turn may refer to localised SDGs. This is different to most known attempts to link national budgets to the SDGs, which do usually not use the goals as management tool for resource allocation (Hege, Brimont and Pagnon, 2019). From the German local government perspective it is an attempt to institutionalise the role of sustainability governance, which too often is just an "add-on" to day-to-day operations, and to limit the rivalry of sustainable and non-sustainable municipal tasks for financing. Accrual accounting, which most German municipalities implemented as a central part of New Public Management, provides the framework. It structures a local government budget in various product areas, product groups and single products to which a municipality could assign specific objectives. The sustainability budget uses this mechanism and follows the idea that financial decisions become subject to sustainability-related targets.

What we learn from the above-mentioned example cities is that usually an interdisciplinary dialog accompanies the development of local sustainability budgets. A common starting point is the implementation of a steering committee consisting of several administrative departments and the city's sustainability management (LAG, 2021). This interdepartmental approach aims at overcoming the silo structure of German public administration. The committee sets up a schedule including all relevant steps, tasks and regular exchange about the progress. Since municipal budgets are complex, a sustainability budget often starts with certain pilot products covering suitable departments. Depending on the size of these selected products, mixed teams can take the lead for individual sub-budgets. In each case, structure and essential elements of the sub-budgets as well as existing target systems are analysed.

Often, cities already have certain strategies (climate strategy, sustainability strategy, mobility strategy, etc.; see section 5.3), which may include appropriate targets for the sustainability budget. Also, municipalities can take EU, federal, or state level sustainability strategies into account, which in Germany often refer to the SDGs (Rautenstrauch and Riedel, 2019; Reuter, 2021; Schuster, 2019). This ensures a consistent cascade of sustainability goals. Finally, localised SDGs or other sustainability-related goals are assigned to the budget's product areas,

product groups, and products. This ensures that sustainability goals cover the entire budget hierarchy. The approach is open for reviewing, reconsidering, and adapting objectives in order to keep them internally and externally consistent.

The city of Cologne, for example, started its sustainability budget in 2019 with linking existing impact-oriented targets to the SDGs within the sub-budgets for the departments of landscape preservation and sports as well as the fire department (Stadt Köln, 2020). In 2020, the sub-budgets for the public health department and the city library followed. In terms of the sub-budget for the fire department, the existing target "ensuring rapid help" was linked to SDG 3 (Good Health and Wellbeing). Within the sub-budget of the department of landscape preservation, the product "parks" was linked to SDG 11.7 (Provision of Green and Public Spaces) (Schuster, 2019). Potential indicators for Cologne are "area of park per inhabitant", "investment in parks" or "number of playgrounds". The city aligned its sustainability targets with the sustainability strategies of the federal level and of North Rhine-Westphalia (Stadt Köln, 2020).

In the course of the local government accrual accounting reform starting in the early 2000s, many municipalities in Germany have already integrated targets into their budgets (Raffer, 2021). These targets may or may not relate to sustainability governance. However, to date, most municipal financial departments hardly ever review these targets or have formulated them so vaguely that they are not suitable for sustainability monitoring in the sense of the SMART approach.[5] Further reasons for this lack of interest in existing targets is the absence of stakeholder engagement in their formulation as well as their failure to be integrated into broadly supported strategies. From this perspective, sustainability budgets with their systematic anchoring of sustainability goals may be a chance to revive impact-oriented steering via the budget. Active involvement of internal stakeholders, increased public interest in sustainability issues, and a focus on monitoring and controlling may create a more favourable environment than in the past. At any rate, the systematic inclusion of sustainability goals in the regular budget sends a clear message not only to local stakeholders, but also to the administration itself since administrative activities and their financing are subject to a sustainability proviso. If budget preparation and financial reporting are aligned accordingly, sustainability effects may be achieved in the medium and long term.

This illustrates that localised SDGs are driving public sector innovation with regard to municipal finance and budget policy despite a restrictive legal framework and a large number of standard processes. However, the development has just begun. In addition, the instrument of sustainability budgets – notwithstanding its comprehensive claim – has so far mostly been used for re-labelling the existing budget with its product groups and products according to their contribution to the

[5] SMART is short for "Specific, Measurable, Achievable, Reasonable, Time-bound" and refers to a project management approach that focuses on measuring project activities in these dimensions.

SDGs or comparable (local) sustainability objectives. Although this creates transparency for public and administration, a systematic review of the extent to which sustainability budgets effectively redirect expenditures and revenues towards sustainability goals is still missing. To measure the impact of SDG target achievement in the medium and long term, sustainability budgets must therefore be flanked by appropriate sustainability monitoring.

5.3 SDG-RELATED LOCAL GOVERNMENT SUSTAINABILITY STRATEGIES

Although the local government sustainability discourse is already in its thirties, it can be assumed that most local governments in Germany still haven't implemented a distinct sustainability strategy. In the absence of concrete figures about the status quo, the relevant memberships, grants and awards described below as well as project outcomes serve as a proxy, ranging from a few dozen to a few hundred municipalities (see, e.g. LAG 21, SKEW). Sustainability strategies are supposed to link long-term visions with medium-term targets and short-term activities. They integrate different local sectors horizontally and link municipal endeavors to national and global strategies vertically (Bass and Dalal-Clayton, 2002; Lange et al., 2020). Local sustainability strategies comprise projects which are managed by the administration and support sustainability in some or all its dimensions, embed them into the municipal framework of sustainability targets and, ideally, link these activities to a system of measurable indicators. Instead of a sustainability strategy, many local governments in Germany use sector-related strategies which also may cover sustainability issues (see, e.g. mobility and transport strategies or integrated city development concepts (ISEK), Rautenstrauch and Riedel, 2019). Often, these have a more narrow, sector-related focus.

Formulating a local sustainability strategy is complex. It requires a clear vision, concrete projects, prioritisation of targets and appropriate indicators. Naturally, many actors and issues have to be involved (see, e.g. Krellenberg et al., 2019). Having such a strategy is certainly a public sector innovation for German local governments and so for most of them is the comprehensive and participatory process of its formulation. In 2018, only a minority used indicator-based sustainability monitoring (Haubner, Riedel and Vollmer, 2018), which is one condition for successful sustainability strategies. The existence of localised SDGs can provide a useful concept for target formulation and indicator definition/prioritisation. The German federal level sustainability strategy as well as the corresponding strategies of many Länder use SDGs as orientation (Rautenstrauch and Riedel, 2019). On the local level, however, only a few governments employ them systematically in their everyday work. Referring to Rogers' (2003) concept of the diffusion of innovation, one can think of a small group of early-adopting local governments and a large majority of late adopters or even laggards.

From survey research we know that the larger a municipality/city is, the better are the odds for administrative and governmental awareness of SDGs (Haubner, Riedel and Vollmer, 2018). In terms of strategic application, we differentiate between

the integration in already existing, often sector-related strategies and overarching sustainability strategies. Since there is no Germany-wide monitoring of local governments' strategic approaches to sustainability, information on the adaptation of existing strategies towards the SDGs is based on case-studies. Rautenstrauch and Riedel (2019) provide a detailed report about the city of Neumünster in Schleswig Holstein, which actively supports the local SDG implementation and linked the core projects of their existing ISEK to the SDGs. Prorok and Rücker (2018) provide further examples of Ludwigsburg and Freiburg (Baden-Wuerttemberg) as well as Hannover (Lower Saxony) which also adapted existing city development strategies as well as sustainability strategies to the SDGs.

The records are better when it comes to the initial formulation of SDG-related local sustainability strategies. The reason for this is the existence of a publicly funded project "Global Nachhaltige Kommune (Globally sustainable municipality)", which is administered by the so called "Servicestelle Kommunen in der einen Welt (SKEW) (Service Agency Communities in the One World)" and actively supports local governments in this process. In 2019, SKEW reported on 70 local governments in Lower Saxony, North Rhine-Westphalia, Saarland, Schleswig Holstein and Thuringia, which were formulating SDG-related sustainability strategies (SKEW, 2019). According to SKEW, their approach helps to break down the global SDGs to the local level and to embed them in integrated sustainability strategies. It enables local governments to evaluate and provide evidence about their active support of the Agenda 2030 and sustainable development in general (Lange et al., 2020). The number of German local governments adopting this innovation is constantly growing. However, considering all the 10,796 German municipalities and 294 counties, their share is still negligible. Nevertheless, the SDG framework seems to be a guiding concept and is as such becoming increasingly popular. Although cross-sectional research to this topic is still missing, similar examples exist for other European countries (Gustafsson and Ivner, 2018; Sánchez Gassen, Penje and Slätmo, 2018; SKEW, 2019).

Beyond SDG-related sustainability strategies there are many individual local government projects supporting Agenda 2030 goals (see, e.g. Peters et al., 2021). As long as these are not part of a strategy, however, they are often short-term oriented and do not yield the hoped for visibility and effect (SKEW, 2019). Moreover, these projects usually do not use SDGs as a tool. This is why we do not consider single local government projects in our contribution.

5.4 SDGs AND SUSTAINABLE FINANCE

SDGs are one reference point for another process that will have a significant impact on financial and budgetary management of municipalities and public companies in the years to come: Sustainable Finance (Kemfert and Schmalz, 2019; Marini, 2019). In its Sustainable Finance Strategy, the German federal government states: "Since states, municipalities, and, in particular, public finance companies are of great importance in the German financial system, they are also important in achieving the

PUBLIC SECTOR ECONOMICS
46 (4) 459-487 (2022)

goal of becoming a leading sustainable finance location" (Bundesministerium der Finanzen, 2021a). For that purpose, there are plans to develop indicators "to better measure and analyse developments at the Sustainable Finance location". SDGs in general and the "SDG indicator catalogue for municipalities" (Bertelsmann Stiftung, 2018) could therefore provide a useful framework.

Starting point of the sustainable finance process in the EU was the report "Financing a sustainable European Economy", prepared by the High-Level Expert Group on Sustainable Finance in 2017 on behalf of the EU Commission (Claringbould, Koch and Owen, 2019). The related taxonomy, which was adopted in June 2020 (Regulation EU 2020/852), contains a comprehensive classification system for currently two environmental targets. It serves the purpose "of establishing the degree to which an investment is environmentally sustainable". For this purpose, selected economic activities are evaluated as to whether they exceed specific thresholds (Art. 3 Regulation EU 2020/852). Many of these thresholds refer to relevant SDG indicator systems.

The Sustainable Finance Taxonomy is thus intended to serve as a lever for a fundamental realignment of the capital markets. Six environmental objectives (Art. 9 Regulation EU 2020/852) are decisive: climate change mitigation and adaptation; the sustainable use and protection of water and marine resources; the transition to a circular economy; pollution prevention and control and the protection and restoration of biodiversity and ecosystems. Redirected capital flows are supposed to support sustainable adaptation and transformation measures to meet the environmental, social, and economic challenges (Bundesministerium der Finanzen 2021a; Larsen and Henderson, 2020). The central idea is that new reporting and verification requirements, which are in effect as of 2022, allow market participants to identify green investments (Schoenmaker and Schramade, 2019). This also affects the public sector and municipalities including the corresponding utilities. The transmission channel for sustainability-oriented capital flows runs from central banks and (institutional) investors via financial market intermediaries (public and private banks, insurance companies, investment funds, etc.) to borrowers, which include municipalities and public enterprises. Currently, German local governments and public enterprises use sustainable financial market products such as green promissory note loans or green bonds only to a small extent (Heinbach et al., 2020; Ortolano and Angelini, 2021; Wendt, 2020).

While institutional investors' interest in sustainable investment products is high and banks currently find it easy to provide capital for sustainable goals, borrowers such as municipalities and companies face the challenge of proving the suitability of investment projects for the available capital (Brand and Steinbrecher, 2019; Kemfert and Schmalz, 2019; Krahnen et al., 2021; Bundesministerium der Finanzen, 2021b). Although the EU taxonomy provides initial guidance, any practicable, cost-effective, and sufficiently tested processes capable of allowing municipalities, public enterprises, and banks alike to channel sustainable investment

financing are still in their infancy. Initial experience with corresponding verification requirements is being gathered in individual pilot programs (C40, 2020).

In the same direction goes a current research project for the development of an SDG-based "sustainability return on investment" for local government budgets (Difu, 2021). In collaboration with eight North Rhine-Westphalian cities, the German Institute for Urban Affairs (Deutsches Institut für Urbanistik) is currently developing a tool to determine not only the economic and budgetary, but also the ecological and social sustainability impacts of municipal investment projects. The qualitative evaluation uses the 17 SDGs and their 169 sub-goals as well as corresponding indicators. Similarly, the "KDZ – Center for Public Administration Research" has developed an "SDG Municipal Check" together with the Institute for Environment, Peace, and Development (IUFE) and the Ecosocial Forum Vienna. It enables cities and municipalities to plan and implement their investment projects along the 17 SDGs (KDZ, 2021).

Recently, online marketplaces for municipal financing such as "Loanboox" or "komuno" started to use localised SDG benchmarking in order to enable potential customers (banks, investors, municipalities) to evaluate a single municipality's sustainability status. Both provide a link to the above-mentioned SDG portal for municipalities (see section 5.1). This shows that for municipalities, market participants, and intermediaries, the role of SDG compliance in municipal finance is becoming increasingly important (Loanboox, 2021). Similarly, the KfW group ("Kreditanstalt für Wiederaufbau"), the largest development bank of the German federal government, is also using the SDGs to assess its own portfolio vis-à-vis third parties (Dangelmaier, 2019).

This shows that the process of realigning credit markets towards sustainable finance is just starting and that SDGs as normative framework can be of implicit importance. An increasing relevance of sustainable finance for municipalities will require reliable reporting mechanisms to confirm that financial means are channelled towards sustainable investments (Brand and Steinbrecher, 2021). For municipal finance departments this means that public sector innovations are about to come and will depend on frameworks like the EU taxonomy or the SDGs.

6 DISCUSSION

In section five we showed that several German municipalities use the SDG portal for indicator-based sustainability reporting. For municipalities that lack the resources to set up a full process with comprehensive and regularly updated reports, embedding a simple link to the data portal with its predefined localised SDGs into their own website allows for a reduced form of sustainability reporting. Understanding public sector innovation as idea, practice, or object that is perceived as new by the adopting organisation following Rogers (2003), the implementation of sustainability reporting is itself innovative. In terms of innovation types as listed by deVries, Bekkers and Tummers (2016), it is a public service innovation, which allows interested

stakeholders and local decision-makers to evaluate sustainability developments within their municipality. Linking this reporting to localised SDGs in the German SDG portal is more an administrative process innovation since it facilitates and therefore increases the efficiency of the reporting process. From a wider perspective, the implementation of SDG-based monitoring in local sustainability governance is a process innovation as well and makes a valid example for reflexive governance in the sense of Meadowcroft (2007). The example shows the importance of technical accessibility. Since the SDG portal provides comparable SDG-related data, municipalities using the portal for their sustainability reporting do not have to research, clean, and compile appropriate small-scale datasets. Hence, the existence of the portal eliminates a resource-related obstacle.

Both reporting on and the formulation of SDG-related sustainability strategies require complex internal and external processes. This may be one reason why currently only a minority of German municipalities pursue such an indicator-driven strategic approach to sustainability governance. The interpretation in terms of its innovative nature is different compared to SDG-based sustainability reporting. Since a new strategy provides a frame of reference for local government decision making, we understand it as conceptual innovation (Bekkers, 2011). Compared to that, the adaptation of already existing sustainability or sector-related strategies to localised SDGs is rather a process innovation since it alters the quality of existing sustainability governance. In addition, the examples in section five indicate that external support, e.g., from the SKEW, plays a crucial role.

As we have seen in section five, German municipal financial departments are already familiar with impact-oriented targets as part of the budget. This was one of the major public sector innovations that came with New Public Management and the corresponding accrual accounting reform in the early 2000s. However, currently most municipalities do not use these product-related targets for steering. The reasons are manifold and a lack of support by local decision-makers as well as vague target formulations are just two of them (see, e.g. Raffer, 2021). The concept of the sustainability budget gives target-oriented steering via municipal budgets another try and therefore uses a mechanism, which, in many municipalities, has already failed once. However, linking new sustainability or SDG-related targets to sub-budgets means taking advantage of what we call "generation two targets". These try to overcome the central shortcomings of their predecessors as they are selected in the course of an interdepartmental process and are the subject of increased public and political interest in sustainability issues. Moreover, using localised SDGs puts the focus on appropriate indicators and measurability. In general, this aims at improving the quality of product-oriented steering with the municipal budget and therefore is an administrative process innovation. It will be interesting to see whether this approach will effectively lead to redirected financial flows.

In Germany, potential SDG-related innovations regarding sustainable finance for (local) governments are still in their infancy. The central question for investors,

financial intermediaries and public borrowers like municipalities is how to channel money that is supposed to enable sustainable development into investment projects that effectively support sustainability. The main interest lies in the verification of the sustainability share of public investments. SDGs may be a reference framework, which would make them a conceptual public sector innovation. However, the first projects are still in the research phase. Interestingly, private sector market participants like German online marketplaces for local government loans use localised SDGs for municipal benchmarking and therefore indicate the relevance of the goal set. At this point, it seems likely that local financial departments will face a wave of public sector innovation in this field. Currently, several options for those innovations seem possible. The first one is a consistent purpose test for lending based on SDGs or EU taxonomy criteria. Counties, cities, and municipalities as well as public enterprises would be obliged to disclose the sustainability purposes for which they require loans. A second option is an ESG[6] rating of entire municipalities: the more a municipality takes these standards into account, the better its general rating and the better its access to sustainable loans. A third option is the requirement of a taxonomy-compliant preparation of the municipal budget as access criterion for sustainability loans. This could increase the relevance of sustainability budgets and, implicitly, of the SDGs. Since all approaches require standardised sustainability reporting based on appropriate indicators, SDGs for municipalities could become particularly important for future public sector innovation in this field (Dangelmeier, 2019).

In sum, this shows that there is a continuum of local government application of the UN sustainable development goals in Germany. While, on the one hand, several innovations in the fields of reporting and strategy formulation are on their way into municipal practice and small but already considerable numbers of local governments apply them, on the other hand SDG-related innovations in budgeting and financing are still in the development stage. In each case, the standardised character of the goal set facilitates their application in innovative processes. This brings us to the conclusion that SDGs drive public sector innovations in the field of sustainability governance. Whereas external support by publicly funded projects and easy access to predefined localised SDGs seem to support this role, the complexity of the goal set as well as conflicting objectives within the set are obstacles.

Obviously, our study is subject to some limitations. Since there is no empirical research in this field, we provide only cursory insights and draw conclusions from a limited number of cases and examples, which, however, represent the current status quo in Germany. Moreover, the absolute number of German local governments that have already integrated SDGs in day-to-day sustainability governance is still small. It is not yet clear whether these innovations will spread. The structure and traditional characteristics of German public administration with its fragmentation, departmental thinking and focus on the rule of law conflicts with the

[6] ESG criteria: Environmental, Social and Governance (see, e.g. Friede, Busch and Bassen, 2015).

holistic nature of sustainable development, which is an obstacle and complicates the implementation of public innovations in local sustainability governance. We suggest the empirical investigation of SDGs' driving nature for public sector innovation as field for future research.

7 CONCLUSION

In times of climate change and rising social inequality, local governments experience increasing pressure to set up effective sustainability governance in order to master the upcoming socio-ecological transformation. Scholars and practitioners agree that this requires a reorientation of existing structures and administrative processes towards strategic, interdepartmental thinking and indicator-based monitoring. The UN Sustainable Development Goals provide a useful frame of reference. In this article, we show that the theoretical concept of public sector innovation helps us a lot to grasp this development. Moreover, we provide several examples which demonstrate how local governments in Germany are already applying SDG-related public sector innovations for sustainability governance. We conclude that the formalised system of SDGs drives these innovations.

We deduce several policy lessons. Implementing localised SDGs for sustainability governance is complex and requires resources, which many local governments in the wake of the pandemic do not possess. Hence, approaches to limit this need for resources can support the diffusion of related innovations. The German case indicates the relevance of publicly funded support projects for local governments. In addition, easy access to predefined localised SDGs seems to be supportive. From past reform processes (LA21, implementation of accrual accounting, etc.) we can learn a lot about potential obstacles. To make local sustainability governance a successful endeavour it is crucial to ensure broad internal and external support for all innovations in the field of sustainability governance. Moreover, they must focus on impact-orientation and reliable monitoring of sustainable development, which underpins the relevance of consistent goal and indicator sets. The current sustainability discourse provides an opportunity for overdue administrative reforms globally, as the SDGs that dominate this discourse have created a consensus on sustainable development in most countries for the first time. Alongside this common policy framework, increasing physical risks, such as the changing climate and its specific local impacts, will even more drive the demand and the overall need for effective public sector innovation.

Disclosure statement

All three authors work for the German Institute of Urban Affairs. Two of the presented examples (SDG portal, SDG-based sustainability return on investment) are parts of ongoing research projects of the Institute.

REFERENCES

1. Ameen, R. F. M. and Mourshed, M., 2019. Urban sustainability assessment framework development: The ranking and weighting of sustainability indicators using analytic hierarchy process. *Sustainable Cities and Society*, 44, pp. 356-366. https://doi.org/10.1016/j.scs.2018.10.020
2. Araos, M. [et al.], 2016. Climate change adaptation planning in large cities: A systematic global assessment. *Environmental Science & Policy*, 66, pp. 375-382. https://doi.org/10.1016/j.envsci.2016.06.009
3. Bartle, J. R. and Leuenberger, D., 2006. The Idea of Sustainable Development in Public Administration. *Public Works Management & Policy*, 10(3), pp. 191-194. https://doi.org/10.1177/1087724X06287507
4. Bass, S. and Dalal-Clayton, B., 2002. *Sustainable development strategies: A resource book*. London: Routlege.
5. Bekkers, V. (ed.), 2011. *Innovation in the public sector: Linking capacity and leadership*. Basingstoke: Palgrave Macmillan.
6. Bell, S. and Morse, S., 2008. *Sustainability indicators: Measuring the immeasurable*? London: Sterling: Earthscan.
7. Bertelsmann Stiftung, 2018. *SDG-Indikatoren für Kommunen: Indikatoren zur Abbildung der Sustainable Development Goals der Vereinten Nationen in deutschen Kommunen*. Gütersloh: Bertelsmann Stiftung.
8. Bertelsmann Stiftung, 2020. *SDG-Indikatoren für Kommunen: Indikatoren zur Abbildung der Sustainable Development Goals der Vereinten Nationen in deutschen Kommunen*. Gütersloh: Bertelsmann Stiftung.
9. Bertelsmann Stiftung, 2022. *SDG Indicators for municipalities*. Gütersloh: Bertelsmann Stiftung.
10. Blühdorn, I., 2020. The legitimation crisis of democracy: emancipatory politics, the environmental state and the glass ceiling to socio-ecological transformation. *Environmental Politics*, 29(1), pp. 38-57. https://doi.org/10.1080/09644016.2019.1681867
11. Böhringer, C. and Jochem, P. E., 2007. Measuring the immeasurable – A survey of sustainability indices. *Ecological Economics*, 63(1), pp. 1-8. https://doi.org/10.1016/j.ecolecon.2007.03.008
12. Borins, S., 2001. Encouraging innovation in the public sector. *Journal of Intellectual Capital*, 2(3), pp. 1469-1930. https://doi.org/10.1108/14691930110400128
13. Bornemann, B. and Christen, M., 2019. Sustainability governance in public administration: Interpreting practical governance arrangements in Swiss cantons. *Environmental Policy and Governance,* 29(3), pp. 159-169. https://doi.org/10.1002/eet.1840
14. Brand, S. and Steinbrecher, J., 2019. Green Bonds – nachhaltige Alternative für die kommunale Infrastrukturfinanzierung? *Fokus Volkswirtschaft*, No. 245.

15. Brand, S. and Steinbrecher, J., 2021. Sustainable Finance in Kommunen: Kann der grüne Kommunalkredit das Eis brechen? *Fokus Volkswirtschaft,* No. 339.
16. Bruyninckx, H., Happaerts, S. and van den Brande, K. (eds.), 2012. *Sustainable Development and Subnational Governments*. London: Palgrave Macmillan UK. https://doi.org/10.1057/9781137005427
17. Bulkeley, H. and Kern, K., 2006. Local Government and the Governing of Climate Change in Germany and the UK. *Urban Studies*, 43(12), pp. 2237-2259. https://doi.org/10.1080/00420980600936491
18. Bulkeley, H., 2010. Cities and the Governing of Climate Change. *Annual Review of Environment and Resources*, 35(1), pp. 229-253. https://doi.org/10.1146/annurev-environ-072809-101747
19. Bundesministerium der Finanzen, 2021a. *Deutsche Sustainable Finance-Strategie*. Berlin: Bundesministerium der Finanzen.
20. Bundesministerium der Finanzen, 2021b. *Green bond allocation report 2020*. Berlin: Bundesministerium der Finanzen.
21. Bundesregierung, 2002. *Perspektiven für Deutschland: Unsere Strategie für eine nachhaltige Entwicklung.* Berlin: Bundesministerium der Finanzen.
22. C40 Knowledge Hub, 2020. How cities can attract investment for a green and just recovery. *C40 Knowledge Hub*, December 2020.
23. Claringbould, D., Koch, M. and Owen, P., 2019. Green Finance: The Macro Perspective. *Vierteljahrshefte zur Wirtschaftsforschung*, 88(2), pp. 11-27. https://doi.org/10.3790/vjh.88.2.11
24. Colglazier, W., 2015. Sustainable development agenda: 2030. *Science*, 349(6252), pp. 1048-1050. https://doi.org/10.1126/science.aad2333
25. Damanpour, F. and Schneider, M., 2009. Characteristics of Innovation and Innovation Adoption in Public Organizations: Assessing the Role of Managers. *Journal of Public Administration Research and Theory*, 19(3), pp. 495-522. https://doi.org/10.1093/jopart/mun021
26. Dangelmaier, U., 2019. Das SDG-Mapping der KfW Bankengruppe: Hintergrundinformationen und Methodikerläuterung. *Fokus Volkswirtschaft,* No. 267.
27. Destatis, 2022. *Daten aus dem Gemeindeverzeichnis: Verwaltungsgliederung in Deutschland am 31.12.2020.* Wiesbaden: Statistisches Bundesamt.
28. DeVries, H., Bekkers, V. and Tummers, L., 2016. Innovation in the public sector: a systematic review and future research agenda. *Public Administration*, 94(1), pp. 146-166. https://doi.org/10.1111/padm.12209
29. Difu, 2021. *Projektskizze Nachhaltigkeitshaushalt und "Nachhaltigkeitsrendite" – Strategische Orientierung im kommunalen Haushalt* (unveröffentlicht).
30. Dreier, H., 2006. *Grundgesetz Kommentar: Artikel 20-82 (Art. 28, Rn. 90).* Tübingen: Mohr Siebeck.
31. Duit, A., Feindt, P. H. and Meadowcroft, J., 2016. Greening Leviathan: the rise of the environmental state? *Environmental Politics*, 25(1), pp. 1-23. https://doi.org/10.1080/09644016.2015.1085218
32. Eltville, 2017. *Global Nachhaltige Kommune*. Stadt Eltville.

33. European Commission, 2021. *Digital Economy and Society Index (DESI) – Digital public services.* Brussels: European Commission.
34. Evans, B. [et al.], 2006. Governing local sustainability. *Journal of Environmental Planning and Management*, 49(6), pp. 849-867. https://doi.org/10.1080/09640560600946875
35. Feichtinger, J. and Pregernig, M., 2005. Participation and/or/versus sustainability? Tensions between procedural and substantive goals in Two Local Agenda 21 processes in Sweden and Austria. *European Environment*, 15(4), pp. 212-227. https://doi.org/10.1002/eet.386
36. Fenton, P. and Gustafsson, S., 2017. Moving from high-level words to local action – governance for urban sustainability in municipalities. *Current Opinion in Environmental Sustainability*, (26-27), pp. 129-133. https://doi.org/10.1016/j.cosust.2017.07.009
37. Fernandez, S. and Rainey, H. G., 2006. Managing Successful Organizational Change in the Public Sector. *Public Administration Review*, 66(2), pp. 168-176. https://doi.org/10.1111/j.1540-6210.2006.00570.x
38. Fetting, C., 2020. *The European Green Deal.* Vienna: ESDN Office.
39. Fiorino, D. J., 2010. Sustainability as a Conceptual Focus for Public Administration. *Public Administration Review,* 70, pp. s78-s88. https://doi.org/10.1111/j.1540-6210.2010.02249.x
40. Fox, S. and Macleod, A., 2021. Localizing the SDGs in cities: reflections from an action research project in Bristol, UK. *Urban Geography*, pp. 1-21. https://doi.org/10.1080/02723638.2021.1953286
41. Freiburg, 2020. *Freiburger Nachhaltigkeitsbericht 2020: Steuerungsgrundlage für kommunale Entscheidungsträger_innen*. Freiburg: Stadt Freiburg im Breisgau.
42. Friede, G., Busch, T. and Bassen, A., 2015. ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), pp. 210-233. https://doi.org/10.1080/20430795.2015.1118917
43. Grafakos, S. [et al.], 2020. Integration of mitigation and adaptation in urban climate change action plans in Europe: A systematic assessment. *Renewable and Sustainable Energy Reviews*, 121. https://doi.org/10.1016/j.rser.2019.109623
44. Graute, U., 2016. Local Authorities Acting Globally for Sustainable Development. *Regional Studies,* 50(11), pp. 1931-1942. https://doi.org/10.1080/00343404.2016.1161740
45. Gustafsson, S. and Ivner, J., 2018. Implementing the Global Sustainable Goals (SDGs) into Municipal Strategies Applying an Integrated Approach. In: W. Leal Filho, ed. *Handbook of sustainability science and research*, pp. 301-316. Cham: Springer. https://doi.org/10.1007/978-3-319-63007-6_18
46. Hansson, S., Arfvidsson, H. and Simon, D., 2019. Governance for sustainable urban development: the double function of SDG indicators. *Area Development and Policy*, 4(3), pp. 217-235. https://doi.org/10.1080/23792949.2019.1585192

47. Haubner, O., Riedel, H. and Vollmer, P., 2018. *Monitor Nachhaltige Kommune*. Bertelsmann Stiftung.
48. Hege, E., Brimont, L. and Pagnon, F., 2019. Sustainable development goals and indicators: can they be tools to make national budgets more sustainable?. *Public Sector Economics*, 43(4), pp. 423-444. https://doi.org/10.3326/pse.43.4.5
49. Heinbach, K. [et al.], 2020. Klimaschutz in finanzschwachen Kommunen: Potenziale für Haushaltsentlastungen, lokale Wertschöpfungseffekte sowie alternative Finanzierungsansätze kommunaler Klimaschutzmaßnahmen. *Schriftenreihe des IÖW*, No. 219/20.
50. Heyen, D. A. and Brohmann, B., 2017. Konzepte grundlegenden gesellschaftlichen Wandels und seiner Gestaltung Richtung Nachhaltigkeit – ein Überblick über die aktuelle Transformationsliteratur. In: J. Rückert-John and M. Schäfer, eds. *Governance für eine Gesellschaftstransformation: Herausforderungen des Wandels in Richtung nachhaltige Entwicklung*. Wiesbaden, Heidelberg: Springer, pp. 69-86. https://doi.org/10.1007/978-3-658-16560-4_3
51. Holden, M., 2011. Public Participation and Local Sustainability: Questioning a Common Agenda in Urban Governance. *International Journal of Urban and Regional Research*, 35(2), pp. 312-329. https://doi.org/10.1111/j.1468-2427.2010.00957.x
52. Holman, N., 2009. Incorporating local sustainability indicators into structures of local governance: a review of the literature. *Local environment*, 14(4), pp. 365-375. https://doi.org/10.1080/13549830902783043
53. Holtkamp, L., 2009. Local Governance – Eine neue Perspektive für die Verwaltungsreformforschung. *Polis*, No. 67/2009.
54. IPCC, 2018. Summary for Policymakers. In: V. Masson-Delmotte [et al.], eds. *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.* Geneve: Intergovernmental Panel on Climate Change.
55. Jann, W., 1983. *Staatliche Programme und "Verwaltungskultur": Bekämpfung des Drogenmißbrauchs und der Jugendarbeitslosigkeit in Schweden, Großbritannien und der Bundesrepublik Deutschland im Vergleich*. Wiesbaden: VS Verlag für Sozialwissenschaften.
56. Jann, W. and Wegrich, K. 2008. Wie bürokratisch ist Deutschland? Und warum? Generalisten und Spezialisten im Entbürokratisierungsspiel. *DMS – der moderne staat – Zeitschrift für Public Policy, Recht und Management*, 1(1), pp. 49-72.
57. Jordan, A., 2008. The Governance of Sustainable Development: Taking Stock and Looking Forwards. *Environment and Planning C: Government and Policy*, 26(1), pp. 17-33. https://doi.org/10.1068/cav6
58. Kawakubo, S. [et al.], 2018. Sustainability assessment of cities: SDGs and GHG emissions. *Building Research & Information*, 46(5), pp. 528-539. https://doi.org/10.1080/09613218.2017.1356120

59. KDZ, 2021. *SDG-Kommunalcheck für nachhaltige Investitionen in Städten und Gemeinden*'. Wien: KDZ – Zentrum für Verwaltungsforschung.
60. Kemfert, C. and Schmalz, S., 2019. Sustainable finance: political challenges of development and implementation of framework conditions. *Green Finance*, 1(3), pp. 237-248. https://doi.org/10.3934/GF.2019.3.237
61. Kemp, R., Parto, S. and Gibson, R., 2005. Governance for sustainable development: moving from theory to practice. *International Journal of Sustainable Development*, 8(1/2), pp. 12-30. https://doi.org/10.1504/IJSD.2005.007372
62. Kharrazi, A., Qin, H. and Zhang, Y., 2016. Urban Big Data and Sustainable Development Goals: Challenges and Opportunities. *Sustainability*, 8(12), p. 1293. https://doi.org/10.3390/su8121293
63. Klopp, J. M. and Petretta, D. L., 2017. The urban sustainable development goal: Indicators, complexity and the politics of measuring cities. *Cities,* 63, pp. 92-97. https://doi.org/10.1016/j.cities.2016.12.019
64. Krahnen, J. P., Rocholl, J. and Thum, M. 2021. A primer on green finance: From wishful thinking to marginal impact. *SAFE White Paper*, No. 87.
65. Krantz, V. and Gustafsson, S., 2021. Localizing the sustainable development goals through an integrated approach in municipalities: early experiences from a Swedish forerunner. *Journal of Environmental Planning and Management,* 64(14), pp. 2641-2660. https://doi.org/10.1080/09640568.2021.1877642
66. Krellenberg, K. [et al.], 2019. Urban Sustainability Strategies Guided by the SDGs – A Tale of Four Cities. *Sustainability,* 11(4), p. 1116. https://doi.org/10.3390/su11041116
67. Kuik, O. J. and Verbruggen, H. (eds.), 1991. *In Search of Indicators of Sustainable Development*. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-011-3246-6
68. Lafferty, W. M. and Meadowcroft, J. R. (eds.), 2000. *Implementing sustainable development: Strategies and initiatives in high consumption societies.* Oxford, New York: Oxford University Press. https://doi.org/10.1093/0199242011.001.0001
69. LAG 21, 2021. *Der kommunale Nachhaltigkeitshaushalt 2019-2021: Bericht zur 2*. Projektphase.
70. LAG 21, 2022. *Nachhaltige Entwicklung auf kommunaler Ebene*.
71. Lahr, 2021. *Nachhaltigkeitsindikatoren: SDG-Indikatoren für Lahr*.
72. Lange, P. [et al.], 2020. Der Beitrag kommunaler Nachhaltigkeitsstrategien zur Umsetzung der Agenda 2030 – die handlungsleitende Ebene (operative Ziele und Maßnahmen) auf dem Prüfstsand. *DVPW Arbeitskreis Umweltpolitik / Global Change,* Tagung 5-6 March 2020.
73. Larsen, M. and Henderson, I., 2020. Green and Sustainable Finance. In: W. Leal Filho [et al.], eds. *Responsible Consumption and Production*. Cham: Springer International Publishing, pp. 1-10. https://doi.org/10.1007/978-3-319-95726-5_75
74. Loanboox, 2021. Wo stehen Kommunen in Sachen Nachhaltigkeit? *Loanboox,* 22 November 2021.

75. Mannheim, 2018. *SDG-Indikatoren für Kommunen*. Stadt Mannheim.
76. Marini, V., 2019. Institutional Initiatives to Foster Green Finance at EU Level. In: M. Migliorelli and P. Dessertine, eds. *The Rise of Green Finance in Europe.* Cham: Springer International Publishing, pp. 119-149. https://doi.org/10.1007/978-3-030-22510-0_6
77. McCormick, K. [et al.], 2013. Advancing sustainable urban transformation. *Journal of Cleaner Production*, 50, pp. 1-11. https://doi.org/10.1016/j.jclepro.2013.01.003
78. Meadowcroft, J., 2007. Who is in Charge here? Governance for Sustainable Development in a Complex World. *Journal of Environmental Policy & Planning*, 9(3-4), pp. 299-314. https://doi.org/10.1080/15239080701631544
79. Meuleman, L. and Niestroy, I., 2019. Economics and governance for sustainability. *Public Sector Economics,* 43(4), pp. 337-343. https://doi.org/10.3326/pse.43.4.1
80. Meuleman, L., 2018. *Metagovernance for sustainability: A framework for implementing the sustainable development goals*. London: Routledge. https://doi.org/10.4324/9781351250603
81. Miller, C. A., 2005. New Civic Epistemologies of Quantification: Making Sense of Indicators of Local and Global Sustainability. *Science, Technology, & Human Values*, 30(3), pp. 403-432. https://doi.org/10.1177/0162243904734489
82. Moore, M. and Hartley, J., 2008. Innovations in governance. *Public Management Review,* 10(1), pp. 3-20. https://doi.org/10.1080/14719030701763161
83. Oates, W. E., 1972. *Fiscal Federalism*. New York: Harcourt, Brace and Jovanovich.
84. OECD, 2020. *A territorial approach to the Sustainable Development Goals: Synthesis report*. Paris: OECD.
85. Ortolano, A. and Angelini, E., 2021. Green Bonds Capital Returns: The Impact of Market and Macroeconomic Variables. In: M. La Torre and H. Chiappini, eds. *Contemporary Issues in Sustainable Finance*. Cham: Springer International Publishing, pp. 91-116. https://doi.org/10.1007/978-3-030-65133-6_4
86. Otto, A. [et al.], 2021. Ranking local climate policy: assessing the mitigation and adaptation activities of 104 German cities. *Climatic Change*, 167(3-4). https://doi.org/10.1007/s10584-021-03184-z
87. Peters, O. [et al.], 2021. *SDG-Maßnahmen für Kommunen: Kommunaltypen, Handlungsempfehlungen und Praxisbeispiele*. Berlin: Deutsches Institut für Urbanistik gGmbH. https://doi.org/10.11586/2021074
88. Piketty, T., 2014. *Capital in the twenty-first century*. Cambridge; London: The Belknap Press of Harvard University Press.
89. Polanyi, K., 1944. *The great transformation*. Boston: Beacon.
90. Prorok, T. and Rücker, L., 2018. *SDGs in Städten – Beispiele für die Umsetzung der UN-Nachhaltigkeitsziele auf kommunaler Ebene.* Wien: KDZ – Zentrum für Verwaltungsforschung.

91. Raffer, C., 2021. Kaum Nutzen trotz hoer Kosten? – Ein Überblick über die empirischen Arbeiten zur kommunalen Doppik in Deutschland. In: M. Junkernheinrich [et al.], eds. *Jahrbuch für öffentliche Finanzen 1-2021*, pp. 425-446. Berlin: Berliner Wissenschafts-Verlag. https://doi.org/10.35998/joefin-2021-0007
92. Rautenstrauch, U. and Riedel, H., 2019. *SDG-orientierte Stadtentwicklung*. Bertelsmann Stiftung.
93. Reimer, N. and Staud, T., 2021. *Deutschland 2050: Wie der Klimawandel unser Leben verändern wird.* Köln: Kiepenheuer & Witsch.
94. Reuter, K., 2021. Genese, Ist und Perspektiven kommunaler Nachhaltigkeitshaushalte: Erfahrungen aus NRW (Landesarbeitsgemeinschaft Agenda 21 NRW, Präsentation zum Workshop).
95. Rink, D. and Kabisch, S., 2017. Urbane Transformationen und die Vision nachhaltiger Stadtentwicklung. In: K.-W. Brand, ed. *Die sozial-ökologische Transformation der Welt: Ein Handbuch.* Campus Verlag, pp. 241-266.
96. Rogers, E. M., 2003. *Diffusion of innovations*. New York; London; Toronto; Sydney: Free Press.
97. Römmele, A. and Schober, H., 2013. *The Governance of Large-Scale Projects*. Baden-Baden: Nomos. https://doi.org/10.5771/9783845243566
98. Rosenzweig, C. [et al.], 2010. Cities lead the way in climate-change action. *Nature*, 467(7318), pp. 909-911. https://doi.org/10.1038/467909a
99. Sánchez Gassen, N., Penje, O. and Slätmo, E., 2018. Global goals for local priorities: The 2030 Agenda at local level. *Nordregio Report*, No. 2018:2. https://doi.org/10.30689/R2018:2.1403-2503
100. Scharpf, F. W., Reissert, B. and Schnabel, F., 1976. *Politikverflechtung: Theorie und Empirie des kooperativen Föderalismus in der Bundesrepublik*. Kronberg/Ts.: Scriptor Verlag.
101. Schnepf, J. and Groeben, N., 2019. Lokale-Agenda-21-Prozesse: Förderliche und hinderliche Bedingungen. *Ökologisches Wirtschaften*, 33(1), pp. 41-46. https://doi.org/10.14512/OEW340141
102. Schoenmaker, D. and Schramade, W., 2019. *Principles of Sustainable Finance.* Oxford: Oxford University Press.
103. Schuster, F., 2019. Doppik für den Klimaschutz – Der Nachhaltigkeitshaushalt. *PublicGovernance*, (Herbst/Winter), pp. 14-16.
104. SKEW, 2019. Agenda 2030 vor Ort: Kommunen zeigen, wie es geht, Servicestelle Kommunen in der einen Welt. *Dossier*, 10-2019.
105. SKEW, 2022. *Landkarte Länderansatzkommunen und SDG-Modellkommunen*.
106. Sørensen, E., 2012. Governance and Innovation in the Public Sector. In: D. Lēwî-Faur, ed. *The Oxford handbook of governance.* Oxford: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199560530.013.0015
107. Stadt Köln, 2020. *Nachhaltigkeitshaushalt der Stadt Köln – weitere Ämter angeschlossen,* 20 December 2020.
108. Stasiowski, E., 2018. *Der Kölner Nachhaltigkeitshaushalt: Vom Outcome zum Impact: Ergebnisse aus der Pilotphase*.

109. Statista, 2022. *Gemeinden in Deutschland nach Gemeindegrößenklassen 2020.*
110. Steurer, R. and Hametner, M., 2013. Objectives and Indicators in Sustainable Development Strategies: Similarities and Variances across Europe. *Sustainable Development*, 21(4), pp. 224-241. https://doi.org/10.1002/sd.501
111. Steurer, R. and Martinuzzi, A., 2005. Towards a New Pattern of Strategy Formation in the Public Sector: First Experiences with National Strategies for Sustainable Development in Europe. *Environment and Planning C: Government and Policy*, 23(3), pp. 455-472. https://doi.org/10.1068/c0403j
112. Stuttgart, 2021. *Lebenswertes Stuttgart – Die globale Agenda 2030 auf lokaler Ebene*. Stadt Stuttgart.
113. Tremblay, D. [et al.], 2021. A Systemic Approach for Sustainability Implementation Planning at the Local Level by SDG Target Prioritization: The Case of Quebec City. *Sustainability,* 13(5), p. 2520. https://doi.org/10.3390/su13052520
114. UN, 2015. *The Millennium Development Goals Report.* Geneve: United Nations.
115. Van Zeijl-Rozema, A. [et al.], 2008. Governance for sustainable development: a framework. *Sustainable Development*, 16(6), pp. 410-421. https://doi.org/10.1002/sd.367
116. Villeneuve, C. [et al.], 2017. A Systemic Tool and Process for Sustainability Assessment. *Sustainability*, 9(10), p. 1909. https://doi.org/10.3390/su9101909
117. Volkery, A. [et al.], 2006. Coordination, Challenges, and Innovations in 19 National Sustainable Development Strategies. *World Development*, 34(12), pp. 2047-2063. https://doi.org/10.1016/j.worlddev.2006.03.003
118. Walker, R. M., 2014. Internal and External Antecedents of Process Innovation: A review and extension. *Public Management Review*, 16(1), pp. 21-44. https://doi.org/10.1080/14719037.2013.771698
119. Weber, M., 1972. *Wirtschaft und Gesellschaft: Grundriß der Verstehenden Soziologie.* Mohr.
120. Wendt, K. (ed.), 2020. *Sustainable financial innovations*. Boca Raton; London; New York: CRC Press Taylor & Francis Group.
121. White House, 2020. Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies. *WH Gow,* April 22, 2021.
122. Xavier, L. Y., Jacobi, P. R. and Turra, A., 2019. Local Agenda 21: Planning for the future, changing today. *Environmental Science & Policy*, 101, pp. 7-15. https://doi.org/10.1016/j.envsci.2019.07.006
123. Zilans, A. and Abolina, K., 2009. A methodology for assessing urban sustainability: Aalborg commitments baseline review for Riga, Latvia. *Environment, Development and Sustainability*, 11(1), pp. 85-114. https://doi.org/10.1007/s10668-007-9099-y
124. Zinkernagel, R., Evans, J. and Neij, L., 2018. Applying the SDGs to Cities: Business as Usual or a New Dawn? *Sustainability*, 10(9), p. 3201. https://doi.org/10.3390/su10093201

Going global, locally? Decentralized environmental expenditure and air quality

SEAN DOUGHERTY, Senior advisor and Head of Secretariat*
ANDONI MONTES NEBREDA, Professor and associated researcher*

Article**
JEL: H76, H79, Q58, Q53
https://doi.org/10.3326/pse.46.4.3

* The opinions expressed and arguments employed here are solely those of the authors and do not necessarily reflect the official views of the OECD or of its member countries. Comments and suggestions from Rolf Alter, Luiz de Mello, Isabelle Chatry and two anonymous referees were most appreciated. The paper was written while Andoni Montes Nebreda was visiting the OECD.

**Received: May 24, 2022
Accepted: June 28, 2022

Sean DOUGHERTY
OECD Network on Fiscal Relations, 2, rue de André Pascal - 75775 Paris, France
e-mail: sean.dougherty@oecd.org
ORCiD: 0000-0002-3297-8359

Andoni MONTES NEBREDA
Ituna Center (UPV/EHU) & ICEI (UCM) - Agirre Lehendakariaren etorbidea, 83, 48015 Bilbao, Spain
e-mail: andomont@ucm.es
ORCiD: 0000-0002-9150-9974

PUBLIC SECTOR ECONOMICS
46 (4) 489-503 (2022)

Abstract

Achieving more liveable cities is one of the main goals set by the Sustainable Development Goals (SDGs). According to a recent survey, most subnational governments participate in SDG implementation, especially to achieve environmental goals. Moreover, the public health concerns of COVID-19 have helped to motivate even more cities to improve local air quality. However, despite the importance of intergovernmental cooperation for the success of the SDGs, there is still limited progress at the regional and local levels, due to limited institutional capacity and doubts about electoral consequences of unevenly distributed costs. We use panel data for 2010-2019, covering 217 OECD metropolitan areas, together with consolidated environmental expenditure, and find that subnational public spending on environmental protection is more strongly associated with better municipal air quality than environmental expenditure by general governments. Moreover, environmental spending shows a relationship with reduced air pollution exposure through the mechanism of higher institutional quality.

Keywords: decentralization, air quality, local governance, environmental policy, urban agenda

1 INTRODUCTION: FISCAL DECENTRALIZATION AND AIR QUALITY

Air pollution is one of the main challenges that policymakers are trying to address within the renewed trend towards urban sustainability. In fact, it is directly related to the United Nations' SDG numbers 3 (Good Health and Well-being), 11 (Sustainable Cities and Communities), and 13 (Climate Change). According to the World Health Organization (WHO), 4.2 million premature deaths worldwide in 2016 were related to ambient air pollution due to its links with heart disease, respiratory illness, and the likelihood of cancer (WHO, 2018).

Since WHO air quality guidelines were published in 2005,[1] cities have at their command objective criteria to measure how polluted their air is. Many countries have implemented legally binding air quality goals to tackle this problem and improve citizens' health and quality of life. However, in many cases, these thresholds have not been reached and citizens are exposed to harmful air pollution levels. Therefore, this issue demands the implementation of more creative and ambitious policies by government. Housing and road transport are among the main sources of the particulate matter that pollutes cities. Housing is responsible for over half of 2.5 micron particles (PM2.5), while road transport contributes closer to 10% in cities (EEA, 2021; OECD, 2021).

In contrast with other environmental issues, such as climate change and global warming, air quality has a more local gradient than greenhouse gas (GHG) emissions. This is why local green agendas are of particular relevance to pursue the issue of cleaner air. In this context, the expression in the title, "going global, locally" gains

[1] WHO air quality guidelines were updated in September 2021 to target higher standards (WHO, 2021).

PUBLIC SECTOR ECONOMICS
46 (4) 489-503 (2022)

traction. Already, subnational governments accounted for two-thirds of climate-significant public expenditure in OECD countries (OECD, 2022a).

However, subnational governments – notably regions and cities – are not always given the appropriate incentives to align with internationally and nationally defined green agendas (De Mello and Martinez-Vazquez, 2022). In fact, while legal thresholds and goals for air pollution are set by central governments, it is often localities that are responsible for implementing building, heating, renovation and energy-saving programmes, and municipalities that are responsible for implementing congestion charges and also defining low emission zones (LEZ) to cope with road traffic. These goals could be achieved by following the rationale of ecological fiscal transfers (EFT), that involve intergovernmental vertical grants paid by central governments to subnational entities conditional on the achievement of environmental goals (Ring, 2002; Busch et al., 2021).

We focus on the fiscal side of governance by first exploring whether environmental public expenditure is related to better air quality levels. This is the first step needed to motivate the integration of environmental agendas within intergovernmental fiscal governance frameworks. Although case-study research is available in the field of fiscal decentralization and air quality outcomes, and the topic has been addressed for the Chinese case, where air pollution is an especially pressing issue (He, 2018; Liu, Ding and He, 2019; Guo et al., 2020; Jong et al., 2021), as far as we know, a broader cross-country analysis has not been carried out. Aiming to cover this gap in the literature, we make use of panel data for 217 OECD countries' metropolitan areas for the 2010-19 period. Our results show that higher subnational public spending on the environment is associated with lower PM2.5 exposure rates, a stronger association than that with all-level government environmental expenditure. Indeed, environmental public spending is linked to lower air pollution exposure rates through higher institutional quality. Finally, income per capita and local tree cover are also significant determinants of lower exposure to air pollution in metropolitan areas.

This paper proceeds with the following structure. The next section looks at previous literature on the link between fiscal federalism and environmental issues, particularly air pollution. Following this, the data and methodology are explained in detail. The fourth section presents and interprets the results. Finally, conclusions and policy recommendations are formulated in the last section.

2 FISCAL FEDERALISM AND THE ENVIRONMENTAL AGENDA

The number of decentralized countries and the intensity of their fiscal and financial self-government have increased during recent decades (OECD/KIPF, 2015; OECD, 2019a, 2022a). Multilevel governance is guided by the subsidiarity principle, inspired by Stigler (1957) and Oates (1972), which suggests that policy responsibilities should be attributed to the lowest layer of government possible. This is also the case for environmental policy, which, despite objectives being set

at international and national levels, frequently needs to be implemented at subnational levels. There are several examples of this shared governance framework, which is even more intense in federal and decentralized countries, such as regional responsibility for building renovation, or local urban waste management, traffic congestion containment measures, and urban planning for green spaces and service equipment.

Not by coincidence, due to the increasing salience that environmental policy has gained over recent decades, scholars of federalism have investigated the interactions between multilevel governance and environmental policy. The outcome is a stream of research known as "Environmental Federalism" (Anderson and Hill, 1996; Harrison, 1996; Scheberle, 1997).

If we focus on the public finance aspects of federalism, Martinez-Vazquez (2021) points out the environmental problems that fall within subnational responsibilities. Among them, in terms of direct energy emissions, transport and buildings tend to be regulated and taxed by regional and local governments, while for non-energy emissions, land use and waste management tend to be largely regulated or influenced by SNGs. Martinez-Vazquez identifies expenditure decentralization as the way to promote much faster mitigation policies and highlights inter-jurisdictional spillovers as the main barrier, which could be corrected through intergovernmental fiscal relations tools, in order to determine a compatible set of incentives.

In a related paper, Smoke and Cook (2021) argue that decentralization and environmental reforms are unlikely to be coordinated, despite existing synergies across levels both policy areas, as previous scholars have argued. In addition, they identify a lack of strong theoretical basis and robust empirical evidence as one of the factors hindering progress in defining responsibility allocation across levels of government based on green goals. This mainly driven by the lack of good quality data at the subnational level (see OECD, 2019b). In fact, in an editorial, De Mello and Martinez-Vazquez (2022) set this need near the top of the research agenda as they examine climate change and fiscal policy. One of the main insights from this agenda is the need to carefully assess the costs and benefits of government spending decisions on environmental protection. They call for the reconsideration of several aspects of fiscal federalism arrangements, such as:

- design of dedicated grant and transfer systems,
- assignment of expenditure responsibilities across layers of administration,
- the extent of subnational revenue and borrowing autonomy, including their ability to collect environmental revenue and borrow to promote investment and foster infrastructure adaptation.

De Mello and Jalles (2022) carried out a new study on decentralisation and the environment. Their work provides arguments to reinforce the case for decentralisation as an effective tool to cope with environmental issues since, according to their analysis of World Values Survey data, decentralisation contributes to more

PUBLIC SECTOR ECONOMICS
46 (4) 489-503 (2022)

favourable attitudes towards the environment, even after controlling for personal and household characteristics, as well as country and cohort effects. Furthermore, they find that decentralisation is correlated with higher government spending on green-related programmes and higher green revenues. In a similar line of thinking, some studies suggest that decentralization could increase local fiscal expenditure on environmentally-related areas (Liu and Zhang, 2013). Others also found the same effect, but this time on the share of local expenditure devoted to environmental protection programmes, although the effects of increased expenditure on environmental outcomes are not clear (Millimet, 2003).

Other authors have focused on the relationship between decentralization and policy outcomes (Liu, Ding and He, 2019; Guo et al., 2020). Most of the work focused specifically on the effect of decentralization on air quality has been carried out in China, where this is a pressing problem. Despite the relevance of this literature for this paper, when results and conclusions are compared, the large differences in institutional frameworks should be taken into account. He (2018) shows that fiscal decentralization has no significant effect on environmental pollution, but finds a significant and positive effect on pollution abatement spending and pollutant discharge fees. Some studies have found a U-shaped relationship between fiscal decentralisation and air pollution, depending the degree of decentralisation (Liu, Ding and He, 2019; Hartman and Kwon, 2005; Copeland and Taylor, 2004). For their part, Guo et al. (2020) find that decentralization increases air pollution, with the impact of revenue decentralization being particularly harmful. However, they view this as potentially a China-specific result, based on local incumbents' preferences for economic growth based on political-career promotion possibilities. The institutional element as a mediating variable on the ability of decentralisation to deliver expected policy outcomes has been also explored in Jong et al. (2021), who found that cities with high levels of government quality and local autonomy but low horizontal fragmentation tend to be the most productive.

With particular relevance for our research, He et al. (2018) focused on the influence of regional environmental expenditure on air quality. Their aim was to compute elasticities between fuel tax policy and environmental expenditure, and the air quality index. To do so, they run a regression discontinuity design (RDD) model over a panel data for seven heavily polluted cities in China for the 2007-2015 period. They found that a 1% increase in regional environmental expenditure led to a minor decrease in an air quality index that ranged between 0.01% to 0.09%, depending on the city, while the impact for three other cities was insignificant. This asymmetric effect is also recorded by Cao, Wang and Zhong (2014); Qi, Huang and Wang (2015); and Xu, Zhang and Zhu (2015). Finally, He et al. (2018) suggest that the introduction of a fuel tax, which is used as an identification strategy, improves air quality and reduces the negative effect of environmental public expenditure.

3 ESTIMATING MODEL AND DATA

Following the broad approach of the previous literature, this paper provides initial cross-country estimates for the impact of subnational public expenditure on environmental protection policies, in order to understand whether the case for decentralisation is supported by green-related goals. Following this aim, our model is defined by the following equation:

$$\Delta exppop = \beta_0 + \beta_1 \Delta \ln(envexp)_{t-1} + \beta_2 \Delta EQI + \beta_3 \Delta \ln(envexp) \times \Delta EQI + \Delta X + \Delta \varepsilon$$

The intuition behind the model is that environmental expenditure policies implemented by subnational governments might be correlated with the degree of exposure for the population living in main metropolitan areas to harmful levels of air pollution, termed as *exppop*. This means that higher environmental expenditure should be linked to lower exposure rates. In addition, when exploring the relationship between spending programmes and outcomes, quality of institutions is a key mediating factor, which is why this interaction channel is also considered. In this sense, higher institutional quality should reinforce the exposure reduction effect of environmental expenditure. Finally, other environmental characteristics of metropolitan areas are considered in order to lower potential issues with unobserved factors that could bias estimations. In the following paragraphs we will present in detail the variables included in the model.

The main explanatory variable, *envexp*, stands for consolidated environmental public expenditure in percentage of GDP. We use logarithmic expression of this variable in order to aid its interpretation as a semi-elasticity. As there may be reverse causality concerns in the relationship between environmental expenditure and air pollution exposure, and there is no available instrument for it, we use a one-year lag structure in order to partially address this issue.

In addition, as "institutions matter" (Acemoglu, Johnson and Robinson, 2005), we account for their role by matching and including the European Quality of Government Index (EQI) at the regional level. This composed perception-based index shows the deviation of the quality of government of each region from the mean, and is relevant to this case because the aim of the model is to examine whether institutional elements of environmental protection expenditure are related to lower exposure to poor air quality.

Next, we look at whether the impact of *envexp* depends on the values of *EQI*, to verify if higher quality of government leads to a larger impact of environmental protection expenditure on exposure to air pollution, by interacting both variables. This intermediate mechanism has been broadly explored by previous literature (Butkiewicz and Yanikkaya, 2011; Rodriguez-Pose and Garcilazo, 2013; Arvin, Pradhan and Nair, 2021).

Finally, X is a vector of other explanatory metropolitan-level air quality determinants such as income per capita, population density and two proxies of main sources of air pollution: the residential sector and transport. The residential sector

is proxied through the share of land area covered by trees. Transport is measured by computing the performance gap between car and public transport. The measure makes use of the International Transport Forum's Transport Performance Index (IFT, 2019), which identifies those destinations that can be reached on foot, by bicycle, public transport or car within a certain time (accessibility). It thus measures how many destinations are close by (proximity). We compute performance gaps for cars versus public transport. The larger the gap, the higher the incentive for driving. Therefore, we expect large gaps to be correlated with higher use of cars, and thus, a larger share of population exposed to low air quality.

In addition to its cross-country approach, a key contribution of this paper is that it makes use of consolidated multilevel Classification of the Functions of Government (COFOG) national accounts expenditure data – for the first time. The rest of the variables used are part of the OECD Metropolitan Areas database, except for data capturing institutional elements, where the European Quality of Government Index (Charron, Lapuente and Dijkstra, 2012) has been used, at the regional level. This index, based on surveys answered by more than 120,000 EU citizens across 208 regions is the best available data source to capture subnational institutional quality. It measures three dimensions of governance to help in an understanding of quality of government: service quality, impartiality, and prevention of corruption. Gathering data from these three sources, we have built panel data for the 2010-19 period for 217 metropolitan areas of 22 OECD European Union member countries (table 1), with the dependent variable illustrated in figure 1.

Table 1

Descriptive variables

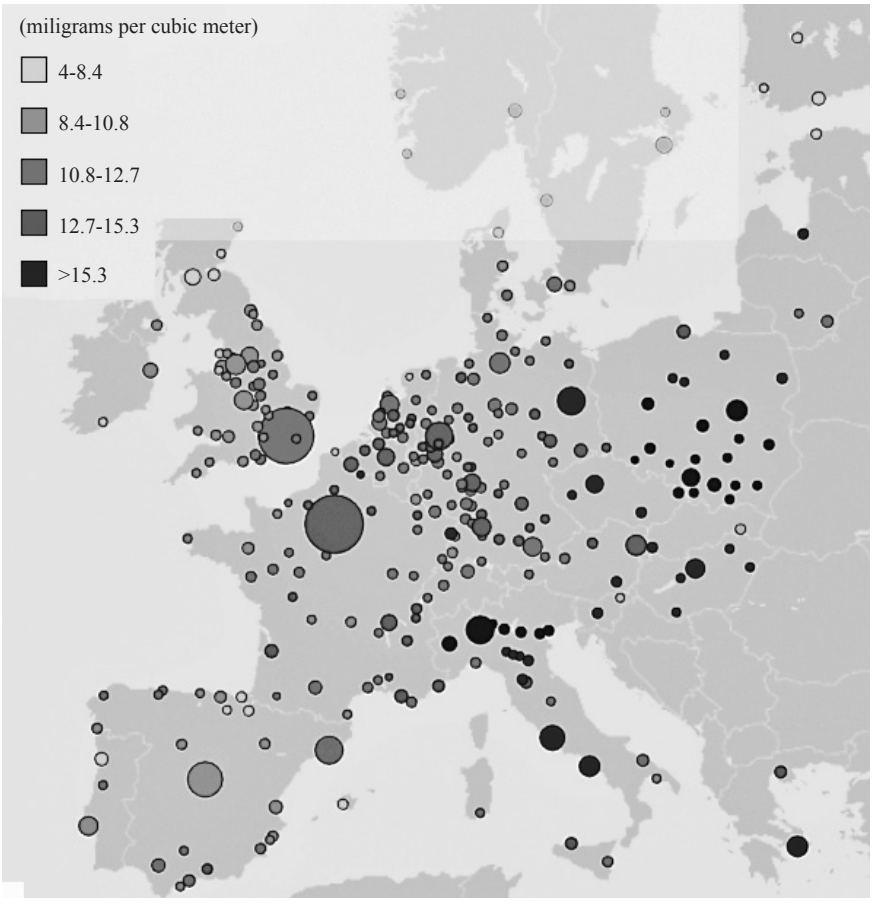
Variables	N	Mean	S.d.	Min	Max	Level
Exposure to PM2.5 >10µg/m^3 (% pop.)	1,953	58.07	46.77	0	100	Metropolitan
GG environmental expenditure (% GDP)	2,306	0.887	0.27	1.00e-10	1.7	Country
SNG environmental expenditure (% GDP)	2,306	0.687	0.295	0.0617	1.385	Country
European Quality of Government Index (regional EQI)	1,562	0.244	1.069	-2.230	1.885	Region
GDP per capita (PPP)	2,016	41,067	13,087	10,714	108,069	Metropolitan
Population density	2,299	2,213	1,603	87	12,929	Metropolitan
Tree cover (% of land)	2,343	14.61	15.13	0	66.30	Metropolitan
Transport performance gap	736	2.257	1.069	0.547	6.537	Metropolitan

Note: Main data are consistent with Gilmore and St. Clair (2018) for the United States and Plouin and Allain-Dupré (2018) for remaining OECD member countries, who explained that although more than half of environmental public expenditure is carried out at the subnational level, it does not reach even 1% of total general government expenditure in most cases. Due to data limitations, and particularly lack of disaggregation (OECD, 2019b, 2020), some variables have been considered at higher levels of government, as described in table 1.

PUBLIC SECTOR ECONOMICS
46 (4) 489-503 (2022)

Figure 1

Exposure to PM2.5 air pollution in OECD European metropolitan areas



Source: OECD metropolitan areas database (https://regions-cities-atlas.oecd.org/).

As illustrated by figure 1, air pollution is very unevenly distributed across countries, but also across cities within European countries. This reinforces the argument for the relevance of the local agenda to tackle this environmental problem. As a measure of air quality we use exposure to 2.5 micron particulate matter (PM2.5), the smallest and most dangerous size category for public health, according to the WHO (2018). In particular, our dependent variable is the population share of the core of the metropolitan area that is exposed to PM2.5 concentrations higher than 10µg/m^3 (*exppop*), which is the lowest threshold set by the WHO in its 2005 guideline and is the most frequently adopted legal threshold implemented in European countries. In addition, making use of the most critical threshold will allow for larger cross-city and time heterogeneity, strengthening the power of our regressions.

With regards to econometric strategy, we first use the variance inflation factor (VIF) test to reject the existence of multicollinearity. Due to the existence of autocorrelation, we cluster standard errors to make them robust to heteroskedasticity.

We report our preferred estimates, which correspond to the first differences (FD) model, as suggested by the rejection of the change in the residual as an independent error term. We do so separately for general government environmental protection expenditure, as well as for subnational expenditure in the same COFOG function, both on a consolidated basis.

4 RESULTS

First, subnational public spending on environmental protection is more highly associated with better municipal air quality than environmental expenditure made by all levels of government. First, we look at estimates for subnational consolidated public expenditure on environmental protection, measured as a percentage of GDP. We use this variable as a proxy for the effort made by regions and cities in pursuing nationally assumed commitments with regards to green agendas. Estimates presented in table 2 suggest that metropolitan areas located in countries with larger subnational expenditure on environmental protection policies record smaller shares of their population exposed to low air quality levels. The size of the link is quite relevant, since a one-half standard deviation increase in public expenditure devoted to green policies – a 21% increase – equates to a 4 percentage point decrease in the share of the population exposed to low air quality one year later. Indeed, if one considers the relatively small amounts of spending devoted to this COFOG function by many subnational governments, such an increase in expenditure is not impossible.

Results for general government's environmental expenditure protection are quite similar to the estimates reported in the previous paragraph for general government, although not as robust, since column 4 shows that the effect is not significant when adding controls for the institutional channel interaction and transport performance gap. This is consistent with descriptive statistics for the database in table 1, since countries with larger total green public expenditure are usually those in which subnational expenditure is also higher. This can be explained because regions and cities have primary responsibility in this COFOG policy function (Gilmore and St. Clair, 2018; Plouin and Allain-Dupré, 2018; OECD, 2022a).

Second, environmental spending shows a strengthened link with reduced air pollution exposure through the mechanism of higher institutional quality. The institutional context, that is usually cited as a key prerequisite to have effective policies, also appears to be strongly correlated with a lower share of population exposed to air pollution. The effect ranges from a 0.26 to 0.47 percentage point decrease in the exposure to low quality air as the institutional quality index (regional EQI) increases one percentage point with respect to the average level. For total expenditure iteration, the range is practically the same, meaning that the regional institutional quality factor is as relevant for subnational governments, as for the public sector in general. More importantly, the model suggests that the link between higher expenditure and lower exposure would be reinforced through increased institutional quality. This outcome is shown by the interaction and is also

consistent with previous literature (Butkiewicz and Yanikkaya, 2011; Rodriguez-Pose and Garcilazo, 2013; Arvin, Pradhan and Nair, 2021) that points towards quality of government as a key mediating element between policies and their outcomes.

Table 2

Summary of estimates for the first difference model

Dependent variable: Change in share of population exposed to PM2.5 (Δ exppop)

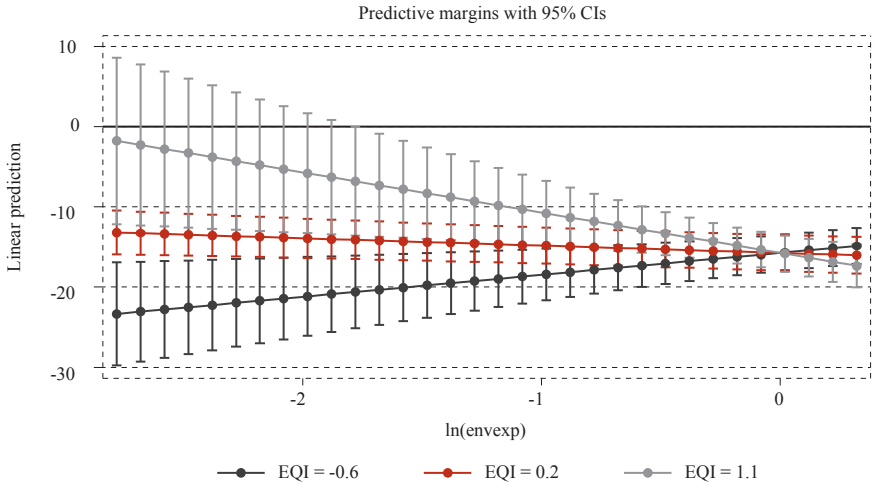
Variable	Subnational government		General government	
	(1)	(2)	(3)	(4)
Δ ln(envexp)$_{t-1}$	-21.28***	-22.12***	-25.82***	-20.72
	(2.293)	(6.947)	(6.210)	(17.33)
Δ regionalEQI	-26.64**	-47.75*	-26.13**	-46.91*
	(11.70)	(23.77)	(11.81)	(24.20)
ln(envexp) * regionalEQI		-4.564**		-7.451***
		(1.699)		(2.353)
Δ GDP per capita	-0.00312***	-0.00275***	-0.00316***	-0.00280***
	(0.000477)	(0.000639)	(0.000470)	(0.000676)
Δ Population density	0.00605	-0.0109	0.000837	-0.00212
	(0.0485)	(0.0601)	(0.0484)	(0.0550)
Δ Tree-cover land share	-26.85***	-25.61	-27.49***	-27.42
	(7.086)	(20.97)	(7.195)	(20.46)
Δ Transport perf. gap.		-1.214		-1.296*
		(0.724)		(0.695)
Constant	-13.60***	-10.68***	-13.59***	-10.61***
	(0.738)	(2.210)	(0.739)	(2.074)
Observations	739	230	739	230
R-squared	0.066	0.091	0.060	0.086

*Note: Robust standard errors in parentheses. Significance *** p<0.01, ** p<0.05, * p<0.1.*

The relevant explanatory power of this interaction can be observed in figure 2, where the correlation between lower air pollution exposure and subnational green expenditure increases for higher levels of institutional quality. Indeed, when institutional quality nears average levels (red line), the "effect" of additional expenditure is almost the same as when expenditure is low or is high. However, when institutional quality is high (grey line), the decreasing pollution exposure "effect" becomes more powerful as expenditure increases. In contrast, when institutional quality is low (black line), additional increases of subnational environmental expenditure become less and less powerful. This interaction effect is thus particularly relevant for lower levels of expenditure, where it becomes less important whether subnational green expenditure is among the highest, based on the European countries represented in our sample.

FIGURE 2

Marginal estimates of exposure to PM2.5 conditional on institutional quality



Finally, income per capita and the extent of tree cover are also significant determinants of lower exposure to air pollution in metropolitan areas. Indeed, estimates for income per capita, population density and share of land covered by trees also yield a negative sign, as expected. However, only income per capita and the tree cover show a significant correlation. In fact, the tree cover share emerges as a very relevant explanatory factor for exposure to low quality air. Accordingly, for an increase of half a percentage point in land covered by trees, 12 percentage points less of the population in metropolitan core areas is exposed to low quality air. These results are in line with literature and policies that point towards the important role that natural space conservation should play to address environmental challenges such as low air quality, but also as natural sink instruments for GHGs (Nowak, Crane and Stevens, 2006; Nowak et al., 2014). Also, cities with higher income per capita show better air quality results, probably due to the increased capacity to use new technologies and of institutions to apply larger and more effective environmental programmes. Indeed, a 1000 euro increase in the GDP *per capita* of a metropolitan area is correlated with a 3 percentage point decrease in share of the population exposed to low quality air. Again, the result is consistent with general government environmental expenditure.

In contrast, estimates for transport performance gap are the opposite sign to expected, since in cities where cars perform comparatively better relative to public transport (larger gap), there is less exposure to low air quality. This could be explained by the fact that these cities, where driving provides more advantages, could be cities with larger suburbs or more dispersed built-up areas. The 30 minute drive considered by the Transport Performance Index could be capturing commutes outside the city centre, which have less effect on the local air pollution exposure index. In addition, model specifications reported in columns 2 and 4 show a loss in sample size due to lower data availability for transport performance. This

loss of sample size could also explain the latter outcome as well as the loss of significance of the tree cover variable. However, the results are consistent with the model specification in columns 1 and 3 regarding the rest of variables.

The estimates are also consistent with previous literature on expenditure and air quality, backing up Nowak, Crane and Stevens (2006) and Nowak et al. (2014). In addition, our results for the long term are also consistent with those of He et al. (2018), who found that a 1% increase in regional environmental expenditure led to a small decrease in air quality index for seven heavily polluted cities in China, while the impact for three other cities was insignificant. This city-dependent effect was also recorded by Cao, Wang and Zhong (2014); Qi, Huang and Wang (2015); and Xu, Zhang and Zhu (2015). He et al. (2018) found that green tax revenue could partly compensate for or reverse the negative impact of decentralized green expenditure on air quality. However, we lack data to replicate the revenue-side of their model.

Finally, it should be kept in mind that these are just initial estimates exploring the association between environmental protection expenditure and air pollution exposure rates. Causality cannot be inferred from the results and future improvements in data availability and quality (OECD, 2019b, 2020b; De Mello and Martinez-Vazquez, 2022), such as metropolitan-level COFOG expenditure could help in improving econometric strategy.

5 CONCLUSIONS

In this paper we made use of a panel data for the 2010-19 period for 217 metropolitan areas of European OECD countries. This paper contributes to the environmental fiscal federalism literature by using cross-country consolidated COFOG expenditure data for the first time. We find that both total and subnational environmental public spending are associated with lower exposure to air pollution, but the link is particularly significant for subnational government intervention. In addition, higher institutional quality also appears to be correlated with lower shares of the population exposed to low air quality. Indeed, environmental public spending shows a stronger link with reduced air pollution exposure rates through higher institutional quality. Finally, higher income per capita and greater tree cover are also significant determinants of lower exposure to air pollution in large cities.

However, these are initial estimates exploring the correlation between environmental protection expenditure and air pollution exposure rates. Future research should explore causality channels, which could be allowed by future improvement in the expenditure data or by making use of unique cross-country events that could serve as identification strategies.

Disclosure statement

No potential conflict of interest was reported by the authors.

REFERENCES

1. Acemoglu, D., Johnson, S. and Robinson, J. A., 2005. Chapter 6 Institutions as a Fundamental Cause of Long-Run Growth. In: *Handbook of Economic Growth Volume 1A*. https://doi.org/10.1016/S1574-0684(05)01006-3
2. Anderson, T. L. and Hill, P. J., 1996. Environmental federalism: thinking smaller. *PERC Policy Series*, No. PS-8.
3. Arvin, M. B., Pradhan, R. P. and Nair, M. S., 2021. Are there links between institutional quality, government expenditure, tax revenue and economic growth? Evidence from low-income and lower middle-income countries. *Economic Analysis and Policy*, 70, pp. 468-489. https://doi.org/10.1016/j.eap.2021.03.011
4. Busch, J. [et al.], 2021. A global review of ecological fiscal transfers. *Nature Sustainability*, 4(9), pp. 756-765. https://doi.org/10.1038/s41893-021-00728-0
5. Butkiewicz, J. L. and Yanikkaya, H., 2011. Institutions and the impact of government spending on growth. *Journal of Applied Economics*, 14(2), pp. 319-341. https://doi.org/10.1016/S1514-0326(11)60017-2
6. Cao, J., Wang, X. and Zhong, X., 2014. Did driving restrictions improve air quality in Beijing. *China Economic Quarterly*, 13(3), pp. 1091-1126.
7. Charron, N., Lapuente, V. and Dijkstra, L., 2012. Regional governance matters: A study on regional variation in quality of government within the EU. *Regional Studies*, 48(1), pp. 68-90. https://doi.org/10.1080/00343404.2013.770141
8. Copeland, B. R. and Taylor, M. S., 2004. Trade, growth, and the environment. *Journal of Economic literature,* 42(1), pp. 7-71.
9. De Mello, L. and Martinez-Vazquez, J., 2022. Climate Change Implications for the Public Finances and Fiscal Policy: An Agenda for Future Research and Filling the Gaps in Scholarly Work. *Economics,* 16(1), pp. 194-198. https://doi.org/10.1515/econ-2022-0026
10. De Mello, L. and Jalles, T. J., 2022. Decentralisation and the environment: Survey-based and cross-country evidence. *REM Working paper series,* No. 0215 - 2022.
11. EEA, 2021. Sources and emissions of air pollutants in Europe. Air quality in Europe 2021. *Report* No. 15/2021.
12. Gilmore, E. A. and St. Clair, T., 2018. Budgeting for climate change: Obstacles and opportunities at the US state level. *Climate policy*, 18(6), pp. 729-741. https://doi.org/10.1080/14693062.2017.1366891
13. Guo, S. [et al.], 2020. Fiscal decentralization and local environmental pollution in China. *International Journal of Environmental Research and Public Health*, 17(22), p. 8661. https://doi.org/10.3390/ijerph17228661
14. Harrison, K., 1996. *Passing the Buck: Federalism and Canadian Environmental Policy*. Vancouver: University of British Columbia Press.
15. Hartman, R. and Kwon, O. S., 2005. Sustainable growth and the environmental Kuznets curve. *Journal of Economic Dynamics and Control*, 29(10), pp. 1701-1736. https://doi.org/10.1016/j.jedc.2004.10.001
16. He, L. [et al.], 2018. A study of the influence of regional environmental expenditure on air quality in China: the effectiveness of environmental policy.

Environmental Science and Pollution Research, 25(8), pp. 7454-7468. https://doi.org/10.1007/s11356-017-1033-8

17. ITF, 2019. Benchmarking Accessibility in Cities: Measuring the Impact of Proximity and Transport Performance. *International Transport Forum Policy Papers*, No. 68.
18. Jong, D. [et al.], 2021. A comprehensive approach to understanding urban productivity effects of local governments: Local autonomy, government quality and fragmentation. *OECD Regional Development Papers,* No. 11. https://doi.org/10.1787/5ebd25d3-en.
19. Liu, A. and Zhang, J., 2013. Fiscal decentralization and environmental infrastructure in China. *The BE Journal of Economic Analysis & Policy*, 13(2), pp. 733-759. https://doi.org/10.1515/bejeap-2013-0082
20. Liu, L., Ding, D. and He, J., 2019. Fiscal decentralization, economic growth, and haze pollution decoupling effects: a simple model and evidence from China. *Computational Economics*, 54(4), pp. 1423-1441. https://doi.org/10.1007/s10614-017-9700-x
21. Martinez-Vazquez, J., 2021. *Adapting Fiscal Decentralization Design to Combat Climate Change.* Washington: World Bank.
22. Millimet, D. L., 2003. Assessing the empirical impact of environmental federalism. *Journal of Regional Science,* 43(4), pp. 711-733. https://doi.org/10.1111/j.0022-4146.2003.00317.x
23. Nowak, D. J. [et al.], 2014. Tree and forest effects on air quality and human health in the United States. *Environmental pollution*, 193, pp. 119-129. https://doi.org/10.1016/j.envpol.2014.05.028
24. Nowak, D. J., Crane, D. E. and Stevens, J. C., 2006. Air pollution removal by urban trees and shrubs in the United States. *Urban forestry & urban greening*, 4(3-4), pp. 115-123. https://doi.org/10.1016/j.ufug.2006.01.007
25. Oates, W. E., 1972. *Fiscal Federalism.* New York: Harcourt Brace Jovanovich.
26. OECD, 2019a. *Making Decentralisation Work: A Handbook for Policy-Makers*. Paris: OECD. https://doi.org/10.1787/g2g9faa7-en
27. OECD, 2019b. Financing climate objectives in cities and regions to deliver sustainable and inclusive growth. *OECD Environment Policy Papers*, No. 17. https://doi.org/10.1787/ee3ce00b-en
28. OECD, 2020. *A Territorial Approach to the Sustainable Development Goals: Synthesis report*. Paris: OECD. https://doi.org/10.1787/e86fa715-en
29. OECD, 2021. *Brick by Brick: Building Better Housing Policies*. Paris: OECD. https://doi.org/10.1787/b453b043-en
30. OECD, 2022a. *Fiscal Federalism 2022: Making Decentralisation Work*. Paris: OECD. http://oe.cd/il/FiscalFederalism
31. OECD, 2022b. *Subnational Government Climate Expenditure and Revenue Tracking in OECD and EU countries*. Paris: OECD. Forthcoming.
32. OECD/KIPF, 2015. *Institutions of Intergovernmental Fiscal Relations: Challenges Ahead.* Paris: OECD.

33. Plouin, M. and Allain-Dupré, D., 2018. *Financing climate objectives in cities and regions to deliver sustainable and inclusive growth. Financing Climate Futures*. Paris: OECD.
34. Qi, W., Huang, H. J. and Wang, S. W., 2015. Traffic restrictions effect on air quality: data integration analysis for Lanzhou City. *In Stat Inf Forum,* 30, pp. 74-81.
35. Ring, I., 2002. Ecological public functions and fiscal equalisation at the local level in Germany. *Ecological Economics*, 42(3), pp. 415-427. https://doi.org/10.1016/S0921-8009(02)00124-6
36. Rodriguez-Pose, A. and Garcilazo, E., 2013. Quality of Government and the Returns of Investment: Examining the Impact of Cohesion Expenditure in European Regions. *OECD Regional Development Working Papers*, No. 2013/12. https://dx.doi.org/10.1787/5k43n1zv02g0-en
37. Scheberle, D., 1997. *Federalism and Environmental Policy: Trust and the Politics of Implementation*. Washington: Georgetown University Press.
38. Smoke, P. and Cook, M., 2022. *Administrative Decentralization and Climate Change. Climate Governance Papers*. Washington: World Bank.
39. Stigler, G. J., 1957. The tenable range of functions of local government. *International Library of Critical Writings in Economics*, 88, pp. 3-9.
40. WHO, 2018. *Burden of disease from ambient air pollution for 2016*. Geneva: World Health Organization.
41. WHO, 2021. *WHO Global air quality guidelines. Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide*. Geneva: World Health Organization.
42. Xu, Y. D., Zhang, J. and Zhu, J. M., 2015. The effect evaluation of the energy: saving emission reduction policies. *Based Diff Chin Air Qual Index J Hei he Univ*, 4, pp. 56-60.

Budget transparency and internal revenue mobilisation at sub-national government level: evidence from Nigeria

MOHAMMED AMINU YARU, Ph.D.*

Article**
JEL: H2, H61, H71
https://doi.org/10.3326/pse.46.4.4

* This paper has benefitted from the suggestions of Prof. I. O. Taiwo at the initial stage of preparing the manuscript. I wish to thank the two anonymous reviewers for their comments which have improved the paper. Ismail Muhammed provided invaluable research assistance at various stages of the research.

** Received: February 15, 2022
Accepted: May 30, 2022

Mohammed Aminu YARU
Department of Economics, University of Ilorin, PMB 1515, Ilorin, Nigeria
e-mail: yaru@unilorin.edu.ng; yaruaminu@yahoo.com
ORCiD: 0000-0001-6891-4907

PUBLIC SECTOR ECONOMICS
46 (4) 505-531 (2022)

Abstract

Internal revenue mobilisation by governments at the sub-national level has been low in Nigeria. In view of the rise in the level of budget transparency at the sub-national level in recent times, this study examines the hypothesis that improved budget transparency leads to greater revenue mobilisation. The study adopts both cross-sectional and panel regression analyses based on data for 2015, 2018 and 2020. The findings suggest that the hypothesis that improved budget transparency improves revenue mobilisation cannot be rejected, but population density (urbanisation), poverty and unemployment are the dominant factors that explain revenue mobilisation by the state governments in Nigeria. The study also reiterates the need to control corruption in order to make sustainable progress in revenue mobilisation at sub-national level.

Keywords: tax, revenue, budget transparency, sub-national government, Nigeria

1 INTRODUCTION

Nigeria is a fiscal federal state comprising three levels of government – the federal government at the national level, and the 36 states and the Federal Capital Territory (FCT), as well as 774 local governments at the sub-national level. The Constitution of the Federal Republic of Nigeria has empowered the sub-national governments to mobilise independent revenue in their respective jurisdictions, often referred to as internally generated revenue (IGR). This comprises tax and non-tax revenues. The sub-national governments also receive statutory transfers monthly from the revenue collected centrally by the federal government and kept in the federation account. Over time, the heavy reliance of sub-national governments on statutory transfers from the federation account has continued to be an issue of mounting concern in Nigeria's fiscal federalism, despite several efforts to improve IGRs (Iniodu, 1999). With the exception of a few states such as Lagos, Ogun, Rivers and Kaduna, where IGR accounts for a substantial share of total revenue, the majority of the states heavily depend on statutory federal transfers for fiscal buffers. For instance, according to the fiscal sustainability index report of 2019, only 3 out of the 36 states could comfortably meet their primary expenditures with their IGRs only, without having to rely on federal transfers/statutory allocation (Adegboyega, 2019). The flow of federal transfers is determined by crude oil prices and the volume of crude sold in the international oil market. Intermittent shocks in the oil market have had adverse effects on the flow of federal transfers, resulting in fiscal crises in the majority of the states.

Several factors have been established in the literature that could be responsible for poor revenue mobilisation by a government. These include low tax compliance and morale of citizens owing to a lack of trust in the government, as well as corruption in the system (Ghura, 1998; Ajaz and Ahmad, 2010; Jahnke and Weisser, 2019; Abdu, Jibril and Muhammad, 2020; Abebe and Fikre, 2020; Zvereva et al., 2021; Yaru and Raji, 2022). Corruption directly affects revenue mobilisation negatively by encouraging tax evasion and revenue theft by public officials, and

PUBLIC SECTOR ECONOMICS 46 (4) 505-531 (2022)

indirectly by lowering taxpayers' morale (Ghura, 1998; Ajaz and Ahmad, 2010; Jahnke and Weisser, 2019; Abebe and Fikre, 2020; Yaru, 2022). However, an increase in the level of budget/fiscal transparency reduces corruption and improves citizens' satisfaction with and trust in the government and tax morality (Bastida and Benito, 2007; Zhang, 2017; Hu et al., 2020; Zvereva et al., 2021). Budget transparency, which implies full disclosure of budget information, reduces the principal-agency problem arising from the information advantage of public officials as agents over the citizens.

Also, budget transparency, which entails public participation in the budget process, provides an avenue through which citizens are able to understand government proposals, participate in choices of public projects and supervise government activities, thereby reducing the perceived level of corruption in the government (Zhang, 2017; Estrada and Bastida, 2020) and boosting citizens' tax morale. The quality of governance also increases with budget transparency (Bisogno and Cuadrado-Ballesteros, 2021). These arguments have propelled the upsurge in budget transparency and accountability initiatives by civil society organisations (CSOs), international development partners and financial institutions, including the World Bank and the International Monetary Fund (IMF) as a way of controlling corruption in governance, particularly in countries like Nigeria where corruption has been endemic (Carlitz, 2013). Nigeria's corruption perception index (CPI) score was 24 out of 100 in 2021, which placed it in the 146th position out of 183 countries (Transparency International, 2022). Similarly, the Open Budget Index (OBI), a measure of budget transparency published by the International Budget Partnership (IBP), shows that Nigeria scored 21 out of 100 in 2019 (IBP, 2019). This suggests that the country is not doing well with respect to either budget transparency or control of corruption at the national level. Though improving over time and relatively better than the national government, the average performance of state governments in overall budget transparency is also low, according to data published by the Civil Resources Development and Documentation Centre (CIRDDOC) in 2015, 2018 and 2020.

Both the government and CSOs in Nigeria have taken measures to promote budget transparency. The Federal Government of Nigeria, through the National Assembly, has enacted a slew of legislation, including the Fiscal Responsibility Act, 2007, Public Procurement Act, 2007 and Freedom of Information Act to provide a legal and institutional framework to promote transparency in the conduct of fiscal governance at the federal level. Most state governments have domesticated these laws and also subscribed to the Open Government Partnership (OGP). Other measures taken to promote fiscal transparency at the sub-national level in Nigeria include the State Fiscal Transparency, Accountability and Sustainability Program-for-Result (SFTAS), which is a conditional grant programme introduced by the World Bank and tied to state-level fiscal transparency. Also, a Nigeria-based civil society organisation, the Civil Resources Development and Documentation Centre (CIRDDOC), with support from the Department of Finance for International Development (DFID)

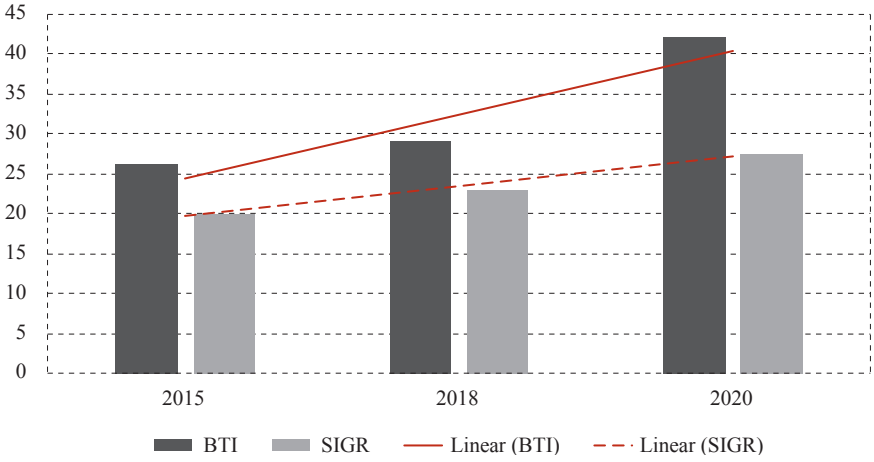
PUBLIC SECTOR ECONOMICS
46 (4) 505-531 (2022)

and the International Budget Partnership has since 2012 been conducting a periodic sub-national Budget Transparency Survey (SNBTS) in Nigeria using a network of budget advocacy partners, mainly CSOs and budget experts drawn from tertiary institutions across the 36 states. One major goal of the survey is to gauge the level of transparency in the budget processes, encourage research and instil the culture of transparency among the states. The surveys have resulted in the production of indices of state-level budget transparency for 2015, 2018 and 2020.

Figure 1 shows the average trend of the Budget Transparency Index (BTI) juxtaposed with IGR performance of state governments measured as average percentage share of IGR in aggregate revenue. On average, the state-level budget transparency as reported in figure 1 has been on a steady rise, likewise the share of IGR in the total revenue of state governments (see figure 1). Thus, given the observed pattern, can the modest rise in IGR performance of state governments be linked to the improvement in the level of budget transparency? Unfortunately, no study has examined the impact of budget transparency on revenue performance of the state governments in Nigeria, and studies on other countries do not abound. Available empirical studies on Nigeria delve into the impact of economic factors on government revenue, at both national and sub-national levels (Eiya and America, 2018; Ohiokha and Ohiokha, 2018; Yaru, 2020). Studies on other countries largely examine the economic and political determinants of budget transparency (Caamaño-Alegre et al., 2013; Sun and Andrews, 2020), while some look at its relationship with corruption and quality of governance (e.g., Bisogno and Cuadrado-Ballesteros, 2021) rather than its impact on revenue mobilisation. Zvereva et al. (2021), which is most closely relevant to the current study, examines the impact of budget transparency on tax compliance.

Figure 1

Trends of average Budget Transparency Index and percentage share of IGR in Aggregate Revenue of State Governments (SIGR), 2015-2020



Source: Compiled from CIRDDOC, 2015, 2018 and 2020, and BudgIT database for various years.

PUBLIC SECTOR ECONOMICS 46 (4) 505-531 (2022)

In an attempt to cover the above gap, this study examines the hypothesis that improved budget transparency leads to greater revenue performance, using both cross-sectional and panel data sets of the state governments in Nigeria. The finding of this study will indicate whether or not the argument that budget transparency enhances domestic revenue mobilisation has empirical support in Nigeria. The remaining parts of this paper are divided into five sections as follows: section 2 provides a review of the literature, section 3 discusses the empirical analysis, section 4 presents the descriptive statistics and correlation analysis, section 5 contains the results and discussion of findings, while section 6 draws the conclusion.

2 REVIEW OF LITERATURE

Both the theoretical literature and the empirical literature have identified the basic factors influencing tax revenue performance by the government. These factors could be grouped into economic, demographic, political and institutional factors (Ajaz and Ahmad, 2010). Of these factors, economic and demographic factors, which include the tax/revenue base of the government (usually measured by the nature and volume of economic activities such as private investment and size of per capita income) and population density/urbanisation, have direct and positive impacts on tax revenue (Karran, 1985; Ade, Rossouw and Gwatidzo, 2018; Andrejovskà and Pulikovà, 2018; Yaru, 2020). However, political and fiscal institutional factors, which include governance, influence tax revenue indirectly through the economic variables, particularly the tax base (Karran, 1985) and efficiency in tax collection (Coulibaly and Gandhi, 2018). For instance, in practice, potential and actual revenue bases, tax efforts, compliance and revenue administration in a fiscal federal setup like Nigeria are determined by political and fiscal institutions, which include the tax laws, intergovernmental fiscal relations and assignment of fiscal responsibilities as defined in the Constitution. Similarly, governance is also an important factor for voluntary tax compliance and tax revenue performance (Ajaz and Ahmad, 2010). The citizens gauge good governance by the degree to which a government is able to provide basic social amenities (Ortega, Ronconi and Sanguinet, 2016) and conducts its business in a transparent manner. Taxpayers' willingness to pay taxes improves when the government is transparent and able to provide basic social amenities (Ortega, Ronconi and Sanguinet, 2016; Zvereva et al., 2021). This argument is corroborated by Yaru and Awodun (2019), a study based on the experience of Internal Revenue Service field staff at the sub-national level, which shows that taxpayers will not be willing to pay taxes if the government fails to provide social amenities, or when there is no trust in government.

Corruption is another major institutional variable that has been found to be detrimental to tax revenue performance (Ajaz and Ahmad, 2010; Eiya and America, 2018; Yaru and Raji, 2022). The ratio of tax revenue to GDP appears to be relatively low in countries with high levels of corruption (Ghura, 1998). Corruption leads to revenue leakages and dampens taxpayers' tax morale (Ajaz and Ahmad, 2010; Jahnke and Weisser, 2019). All of these negatively affect governemnt revenue. The empirical literature on Nigeria corroborates the argument that **c**orruption has a

negative and significant impact on national tax revenue performance (Eiya and America, 2018). Population density, a measure of economic base and revenue efforts, however has a positive impact on the revenue performance of local governments in Nigeria (Yaru, 2020). The impact of grants on tax revenue is found to be negative in the short run but positive in the long run, while loans have a positive impact in the short run and a negative impact in the long run (Amusa, Monkam and Veigi, 2020). In contrast, the effect of population growth (another measure of growth of tax base) on national tax revenue is found to be statistically insignificant (Ohiokha and Ohiokha, 2018). This finding contradicts the theory. This might be due to the incidence of poverty, unemployment and the non-inclusive economic growth experienced in the country (Yaru et al., 2018).

So far, the review provides a general insight into how some economic and demographic variables influence tax revenue performance, but not much could be discerned about the effect of fiscal institutions, particularly budget transparency, on domestic revenue mobilisation by state governments in Nigeria. This study intends to fill this gap by examining the impact of budget transparency on the internal revenue performance of state governments in Nigeria.

3 EMPIRICAL ANALYSIS

The study uses both simple descriptive statistical and econometric analyses to achieve its objective. Table 1 presents the details of all the variables in the models, their measurements and sources of data. The descriptive analysis involves the summary statistics, which include the mean, range and standard deviation of both the dependent and independent variables for the 36 states presented in table 2. Similar statistics for the 17 states in the south and 19 northern states are provided in tables A1 and A2 in appendix. In addition, the linear relationships between the variables are examined using pairwise correlation analysis. Table 3 provides the results.

The econometric analysis involves the estimation of cross-sectional and panel data regression models specified in equations 1 and 2 respectively. The models examine the impacts of economic factors/revenue base proxied by population density (PDS), socio-economic factors proxied by poverty (POV) and unemployment rates (UR), political factors (POF) proxied by length of years the state governor spends in office (YEARS), dummy variables for term in office (TERM) and political party affinity with the ruling party in the centre (PAC), and measures of budget transparency (BT) on the internal revenue performance of state governments (SIGR) in Nigeria.

$$SIGR_i = \beta_1 + \beta_2 PDS_i + \beta_3 POV_i + \beta_4 UR_i + \beta_5 POF_i + \beta_6 BT_i + \varepsilon_i \quad (1)$$

$$SIGR_{it} = \beta_{1i} + \beta_2 PDS_{it} + \beta_3 POV_{it} + \beta_4 UR_{it} + \beta_5 POF_{it} + \beta_6 BT_{it} + \beta_7 COR_{it} + \beta_8 BT \times COR_{it} + \varepsilon_{it} \quad (2)$$

PUBLIC SECTOR ECONOMICS
46 (4) 505-531 (2022)

Where:
$SIGR_{it}$ = State IGR proxied by State's IGR share in total revenue,
PDS_{it} = Economic factor/revenue base measured by population density in the state,
POV_{it} = Measure of poverty (Poverty headcount ratio),
UR_{it} = Unemployment rate,
POF_{it} = Measures of Political Factors,
BT_{it} = Measures of Budget Transparency,
COR_{it} = Control of Corruption,
ε_i and ε_{it} = Error Terms,
β_j = Coefficients, j = 1, 2,…8 and i = 1, 2, 3…, 36, t = 1, 2, 3.

A-priori, the impacts of the socio-economic variables (population density/urbanisation, poverty and unemployment) on revenue are direct and unambiguous. For instance, the measure of the revenue base in the model, which is population density/urbanisation, is expected to have a positive impact on state revenue performance, while poverty and unemployment are expected to have negative effects on revenue. Increase in level of poverty or unemployment would reduce the taxable population/tax base, and consequently, potential tax revenue. Political and fiscal variables may not necessarily have definite a-priori expectations. For instance, it is expected that states with governors that belong to the ruling party at the federal level may enjoy some fiscal privileges and capital projects from the federal government, which might reduce their independent revenue efforts. Thus, it is assumed that political party affinity with the centre may impact negatively on independent revenue efforts of states and domestic revenue mobilisation. It is also expected that state governors who are serving their first terms in office may not want to indulge in aggressive tax reforms that will make them unpopular among the electors and jeopardise their re-election prospect. Aggressive tax and other revenue reforms are mostly implemented by governors in their second term in office. Thus, term in office should impact positively on revenue mobilisation, likewise length of years spent by the governor in office.

Aggregate budget transparency and its various components are however expected to have positive influences on revenue performance through citizens' voluntary tax compliance. The argument put forth here is that increase in fiscal transparency will improve citizens' trust in the government, which will in turn improve voluntary tax compliance and revenue performance (Zvereva et al., 2021; Yaru, 2022). Budget transparency is also expected to improve citizens' participation in governance, promote good governance and reduce corruption in revenue administration (Bastida and Benito, 2007). All of these should result in improved revenue mobilisation.

Table 1

Variables, measurement and data sources

Variables	Measurement	Impact on IGR (a-priori expectation)	Sources
Internally Generated Revenue (IGR)	Share of IGR in total Revenue (SIGR)		Publications of NBS (Annual Abstract of Statistics) and BudgIT publications for various years
Economic Factors	Population Density (Number of People per Square Km) (PDS)	Positive (+)	Publications of NBS
Socio-economic Factors	Poverty Rate (POV)	Negative (-)	Publications of NBS (Annual Abstract of Statistics for various years)
	Unemployment Rate (UR)	Negative (-)	
Political Factors (POF)	Political Party Affinity with centre ((PAC) = 0 if the Governor belongs to the ruling party at the federal level, otherwise =1)	Negative (-)	INEC, Nigeria
	TERM (= 0, if the Governor is serving his/her first term in office, 1 = if serving second term in office)	Positive (+)	
	Number of years in Office (YEARS)	Positive (+)	Compiled by author from INEC, Nigeria
Fiscal Institutions (BT)	Budget Transparency Index (BTI)	Positive (+)	CIRDDOC, Nigeria
	Public Availability of Key Budget Documents (BAI)	Positive (+)	
	Public Participation Index (PPI)	Positive (+)	
	Public Access to Public Procurement Information (PPRI)	Positive (+)	
Corruption	Control of Corruption at national level (COR)	Positive (+)	World Governance Indicators

Note: NBS = National Bureau of Statistics; INEC = Independent National Electoral Commission.

Source: Author's compilation (2021).

PUBLIC SECTOR ECONOMICS 46 (4) 505-531 (2022)

The regression models are estimated in two forms (extended and restricted) based on the available cross-sectional and panel data sets, using the ordinary least squares (OLS) estimation technique. The extended models, which include poverty (POV), cover only two sample points due to unavailability of data on poverty for one of the years, while restricted models omit the poverty variable (POV) in order to have results covering all the three sample points and all the observations for the years covered by the study. In sum, the restricted models with a larger number of observations serve as a robustness check for the results obtained in the extended models which contain fewer observations. The models are estimated using a data set of all the 36 states of Nigeria, as well as sub-samples of 19 northern and 17 southern states respectively (see table A4 in appendix). The essence is to check the robustness and consistency of the estimated results through comparison between the two regions. In order to ascertain the most appropriate forms of panel data model to fit the data (i.e., Pooled OLS, Fixed Effects and Random Effects models), F-test and Hausman test are conducted in the study. The null hypothesis of the F-test is that there is no heterogeneity in the models, while the null hypothesis of the Hausman (1978) test is that random effect is more appropriate.

The data used for this study are cross-sectional and panel data sets of the 36 states in Nigeria on IGR, population density, poverty rate, unemployment rate, dummy variables representing State Governor's political party affinity with the centre and term in office, and length of years the governor spends in office as measures of political factor and indices of different components of budget transparency for 2015, 2018 and 2020 fiscal years. The scope was dictated by availability of data on budget transparency indices, published by CIRDDOC, Nigeria.

4 DESCRIPTIVE STATISTICS AND CORRELATION ANALYSIS

The descriptive statistics on the dependent and independent variables for the 36 states are presented in table 2. The statistics show that the average share of IGR as percentage of total revenue for all the 36 state governments stands at 23.41 for the selected years considered (i.e., 2015, 2018 and 2020), with a minimum of 5.45 and maximum of 78.33. The wide range is largely explained by the performance of urbanised states including Lagos, Rivers and Delta in the south, where IGR accounts for the bulk of the revenue; and very poor performance of less urbanised states in the north. Similar patterns are discernible with the independent variables, particularly budget transparency. For instance, the average score for overall budget transparency is 32.41, with a minimum score of 7 and maximum of 90 out of 100. The descriptive statistics by region show that the average share of IGR in the total revenue is 17.20 percent in the 19 northern states, with a minimum of 5.45 and maximum of 44.57 (see table A2 in appendix). However, the average share in the southern states is 30.36 percent of the total revenue (see table A1 in appendix). The analysis of the descriptive statistics of the various measures of overall budget transparency by region show an average score of 34.10 and 30.89 in the southern and northern states respectively (see tables A1 and A2). The summary statistics indicate that the southern states have performed relatively well in

both revenue performance and budget transparency. The rather low average scores for both regions however suggest that the budget process at the state level in Nigeria is still shrouded in secrecy despite the increasing pressures from CSOs and international development partners.

The correlation matrix in table 3 indicates a strong positive relationship between population density (PDS) and the share of IGR total revenue. The correlation between the share of IGR and the various indices of budget transparency appear weak but also positive. Public access to procurement information (PPRI) has the highest correlation coefficient of 0.2301 among the three indices.

Table 2

Descriptive statistics for the 36 states

Variable	Obs.	Mean	Std. dev.	Min	Max
SIGR	108	23.41	14.57	5.45	78.33
PDS	108	443.00	613.61	52.93	3885.70
POV	71	53.46	23.72	4.50	88.50
UR	108	31.88	15.10	8.37	64.75
PAC	108	0.39	0.49	0	1
BTI	108	32.41	18.18	7	90
BAI	108	36.00	21.96	5	91
PPI	108	22.64	20.94	0	100
PPRI	108	33.37	22.11	0	100
TERM	108	0.51	0.50	0	1
YEARS	108	3.86	2.24	1	10
COR	108	13.14	0.45	12.50	13.46

Source: Author's computation (2021).

The preliminary insight from the correlation matrix in table 3 is that level of budget transparency and political factors might not be strong determinants of IGR performance of states in Nigeria. The strong correlation between percentage share of IGR (*SIGR*), population density (*PDS*), poverty (*POV*) and unemployment (*UR*) suggest that the socio-economic factors, which include population density, poverty and unemployment, are likely to be responsible for the wide variation in the IGR performance among states. Meanwhile, the correlation among the various measures of budget transparency range between 0.4393 and 0.9262, suggesting a strong, positive relationship among the various measures.

Table 3

Correlation matrix for the 36 states

	SIGR	PDS	POV	UR	PAC	BTI	BAI	PPI	PPRI	TERM	YEARS	COR
SIGR	1											
PDS	0.6413	1										
POV	-0.5486	-0.4022	1									
UR	-0.1121	-0.0242	-0.1872	1								
PAC	0.0254	0.1022	-0.1192	0.0405	1							
BTI	0.2250	0.1588	-0.2235	0.1160	-0.0652	1						
BAI	0.1544	0.0720	-0.2478	0.1394	-0.1095	0.9262	1					
PPI	0.2004	0.2092	-0.0666	-0.0750	-0.0050	0.7420	0.5440	1				
PPRI	0.2301	0.1929	-0.0839	0.1071	0.0185	0.6962	0.4393	0.4875	1			
TERM	-0.0112	-0.0158	0.1469	-0.2382	-0.1288	0.0845	0.0424	0.1621	0.0696	1		
YEARS	-0.0302	-0.0666	-0.2344	0.3799	0.1860	0.0613	0.1549	-0.1400	-0.0563	0.1714	1	
COR	0.1709	0.0417	-0.4607	0.6722	0.0403	0.2461	0.3217	-0.0983	0.1199	-0.2226	0.4757	1

Source: Author's computation (2021).

PUBLIC SECTOR ECONOMICS
46 (4) 505-531 (2022)

5 RESULTS AND DISCUSSION OF FINDINGS

The results of the estimated cross-sectional regression models are presented in table A3 in appendix, while tables 4-6 present the results of the panel data regression models in 14 columns. Table 4 presents the results of the models involving the 36 states. Table 5 contains the results involving the 17 southern states, while table 6 considers the sub-sample of northern states. In the estimated models without the corruption variable, only the most preferred among Pooled OLS, Fixed Effects and Random Effects models are reported. Precisely, the results of the affected models are presented in columns 1-4 of tables 4-6. Incidentally, based on the outcome of the Hausman test, 10 out of the 12 preferred models reported are Random Effects, while 2 are Fixed Effects models. However, the remaining models whose results are presented in columns 5-14 of the tables are all Random Effects due to the inclusion variable on corruption (COR) which only varied with sample points but were invariant across the cross-sectional units. This is because the study adopts the national scores for the states in the three sample points covered by the study.

The baseline results are presented in columns 1-4 of tables 4-6. The results in columns 1-2 of the tables examine the impact of overall budget transparency (BTI) on internal revenue performance, while results in columns 3-4 examine the impacts of three components of budget transparency (i.e., public availability of key budget documents (BAI), public participation (PPI) and public availability of state procurement information (PPRI)) on internal revenue performance. The results presented in columns 5-6 of the tables examine the impacts of overall budget transparency, control of corruption and different measures of political factors on revenue. Meanwhile, columns 7-14 present the results of effects of each measure of budget transparency on revenue mobilisation. This is meant to control for multicollinearity, given the moderate to very high pairwise correlation among the various measures of budget transparency presented in table 3.

The results in tables 4-6 indicate that population density, poverty rate, unemployment and control of corruption are the most consistent and statistically significant determinants of internal revenue performance of state governments in Nigeria. Overall budget transparency (BTI) was also recorded as having significant impact on revenue performance in two of the estimated models involving the 36 states at 5 percent significance level. A similar result was also reported for the variable in the 19 northern states, though at 10 percent significance level in one of the models. Contrarily, only population density and poverty appeared as significant factors in the models involving the sub-sample of the 17 southern states. Looking at the impact of the three components of budget transparency, i.e., public availability of key budget documents (BAI), public participation (PPI) and availability of public procurement information (PPRI) on revenue in table 4, it appears that only the public availability of key budget documents is significant in two of the models involving the 36 states. Public availability of budget documents and availability of public procurement information turn out significant in two and one of the preferred models for the sub-sample of northern states respectively.

PUBLIC SECTOR ECONOMICS 46 (4) 505-531 (2022)

Meanwhile, only the public availability of budget documents was marginally significant at 10 percent significance level in the models involving the sub-sample of southern states. This suggests that budget transparency might have to be comprehensive to have a significant impact on revenue mobilisation. In other words, making budget documents and procurement information available to the public without providing ample opportunities for effective public participation may not have a significant impact on tax compliance and revenue performance.

Only one of the political variables, political party affinity with centre (PAC), appears to be marginally significant in the southern states, but not for models involving the 36 states and the sub-sample of northern states respectively. This is supported by the evidence from the correlation analysis provided in table 2, which indicates a low correlation between revenue performance and each of the political variables. One reason that could be adduced for this result is that fiscal behaviours of the state governments are largely similar irrespective of the ruling political parties or changes in political institutions (Yaru et al., 2014). More so, the state governors are not different in terms of ideologies, even when they belong to different political parties. This is demonstrated by the incessant defection of state governors from one political party to another. In 2014, for example, about five state governors elected under the platform of the People's Democratic Party (PDP) defected to the All Progressives Congress (APC) (Yaru, 2015). Similarly, after the 2019 general elections, the governors of Zamfara, Ebonyi and Akwa-Ibom states who were elected under the platform of PDP defected to the APC[1].

The results of the models that examine the impact of corruption and its interactive effects with the various measures of budget transparency on revenue performance in columns 5-14 of tables 4-6 indicate that control of corruption has a positive and statistically significant influence on domestic revenue mobilisation in almost all the estimated models. However, the interactions between control of corruption and the various measures of budget transparency are not statistically significant in any of the models. This is unexpected from a theoretical perspective but not surprising as the various components of budget transparency are not statistically significant individually and control of corruption variable is common for all the states in each sample point.

The insight from the results of the estimated models is that the variation observed in internal revenue performances among states in Nigeria is largely attributable to economic factors, particularly population density/urbanisation and the prevailing socio-economic conditions (poverty and unemployment rates). Studies with similar findings at national level include Andrejovskà and Pulikovà (2018), which finds that employment rate is one of the strongest drivers of tax revenue in EU countries.

[1] PDP was the ruling party at the national level between 1999 and 2015, while APC was formed in 2013 as coalition party by members of the defunct Action Congress of Nigeria (ACN), All Nigeria People's Party (ANPP), Congress for Progressive Change (CPC), and factions of the People's Democratic Party (PDP) and All Progressives Grand Alliance (APGA) to form a formidable opposition against the PDP in preparation for the 2015 general elections.

TABLE 4

Results of panel data regression model for the 36 states

Variables	Random effects[a]	Fixed effect[a]	Random effects[a]		Random effects							
PDS	0.0125***	0.0174	0.0126***	0.0150***	0.0139***	0.0139***	0.0138***	0.0140***	0.0138***	0.0141***	0.0137***	0.0141***	0.0138***	0.0141***
	(0.00273)	(0.0114)	(0.00276)	(0.00270)	(0.00281)	(0.00271)	(0.00282)	(0.00267)	(0.00286)	(0.00271)	(0.00284)	(0.00270)	(0.00273)	(0.00262)
POV	0.149***	-	-0.144***	-	-0.0235	-	-0.0223	-	-0.0199	-	-0.0317	-	-0.0349	-
	(0.0494)		(0.0516)		(0.0539)		(0.0532)		(0.0531)		(0.0542)		(0.0544)	
UR	-0.0439	0.0502	-0.0627	0.0201	-0.227***	-0.152***	-0.201**	-0.155***	-0.203**	-0.155***	-0.202**	-0.165***	-0.234***	-0.170***
	(0.0711)	(0.0428)	(0.0756)	(0.0415)	(0.0820)	(0.0582)	(0.0830)	(0.0582)	(0.0803)	(0.0584)	(0.0876)	(0.0572)	(0.0865)	(0.0576)
BTI	0.140***	0.133***	-	-	-	-	0.885	0.501	-	-	-	-	-	-
	(0.0536)	(0.0384)					(1.316)	(0.907)						
BAI	-	-	0.0920*	0.0916***	0.0317	0.0300	-	-	0.998	0.562	-	-	-	-
			(0.0498)	(0.0334)	(0.0509)	(0.0344)			(1.086)	(0.818)				
PPI	-	-	-0.0224	-0.0263	-0.00936	0.0171	-	-	-	-	0.670	-	-	-
			(0.0544)	(0.0415)	(0.0538)	(0.0396)					(1.333)			
PPRI	-	-	0.0612	0.0481	0.0529	0.0224	-	-	-	-	-	-	0.0657	0.447
			(0.0515)	(0.0369)	(0.0452)	(0.0341)							(0.995)	(0.703)
PAC	-0.947	-1.836	-0.855	-1.547	-0.841	-1.297	-1.397	-1.244	-1.320	-1.132	-1.741	-1.411	-0.949	-1.265
	(1.663)	(1.257)	(1.690)	(1.257)	(1.705)	(1.203)	(1.738)	(1.180)	(1.683)	(1.180)	(1.998)	(1.197)	(1.684)	(1.223)
TERM					2.251	0.727	1.771	0.699	2.097	0.860	0.670	0.833	2.301	0.710
					(2.344)	(1.157)	(2.202)	(1.146)	(2.167)	(1.136)	(1.333)	(1.186)	(2.169)	(1.179)
YEARS					-0.444	-0.224	-0.295	-0.221	-0.389	-0.280	-0.210	-0.217	-0.376	-0.200
					(0.443)	(0.298)	(0.433)	(0.289)	(0.407)	(0.286)	(0.514)	(0.299)	(0.429)	(0.297)
COR					10.01***	8.329***	11.62***	9.208***	12.58***	9.558***	11.53***	9.071***	10.44***	9.941***
					(2.739)	(1.916)	(3.943)	(2.742)	(3.851)	(2.680)	(3.025)	(2.138)	(3.394)	(2.490)
BTI*COR							-0.0629	-0.0331	-	-	-	-	-	-
							(0.102)	(0.0689)						
BAI*COR							-	-	-0.0733	-0.0393	-	-	-	-
									(0.0839)	(0.0620)				
PPI*COR							-	-	-	-	-0.0492	0.0109	-	-
											(0.103)	(0.0571)		
PPRI*COR							-	-	-	-	-	-	-0.000471	-0.0311
													(0.0772)	(0.0538)

Variables	Random effects[a]	Fixed effect[a]	Random effects[a]		Random effects									
Constant	22.83***	10.51**	22.66***	12.43***	-107.7***	-88.56***	-128.6**	-99.93***	-140.3***	-103.9***	-125.6***	-96.80***	-112.0**	-108.3***
	(4.841)	(4.768)	(4.910)	(2.646)	(35.50)	(23.31)	(51.20)	(34.62)	(49.80)	(33.78)	(39.90)	(26.87)	(44.97)	(31.52)
Observations	71	108	71	108	71	108	71	108	71	108	71	108	71	108
Number of states	36	36	36	36	36	36	36	36	36	36	36	36	36	36
R-squared	0.533	0.262	0.535	0.438	0.528	0.503	0.515	0.500	0.509	0.495	0.531	0.506	0.545	0.506
F/Wald Chi^2 statistic	67.27***	6.02***	66.66***	52.49***	90.90***	77.41***	92.08***	78.48***	92.0***	77.31***	87.77***	75.93***	90.00***	76.81***
F-test for homogeneity														
Hausman test	6.09[0.297]	20.52***[0.000]	9.44[0.222]	9.54[0.145]										

[a] *Preferred Model based on Hausman test; Standard errors in parentheses; p-values in brackets; *** p<0.01, ** p<0.05, * p<0.1.*

Source: Author's computation (2021).

TABLE 5

Results of panel data regression model for the 17 Southern states

Variables	Random effect[a]	Fixed effect[a]	Random effects[a]		Random effects					
PDS	0.0108***	0.0114	0.0107***	0.0123***	0.0115***	0.0119***	0.0115***	0.0119***	0.0117***	0.0119***	0.0120***	0.0115***	0.0124***
	(0.00399)	(0.0122)	(0.00409)	(0.00399)	(0.00410)	(0.00409)	(0.00411)	(0.00410)	(0.00395)	(0.00407)	(0.00408)	(0.00410)	(0.00402)	(0.00395)
POV	-0.126**	-	-0.133**	-	-0.0507	-	-0.0228	-	-0.0242	-	-0.0163	-	-0.0411	-
	(0.0623)		(0.0647)		(0.0999)		(0.0919)		(0.0952)		(0.0926)		(0.0943)	
UR	-0.0286	0.0508	-0.0361	-0.00856	-0.164	-0.176	-0.182	-0.161	-0.188	-0.149	-0.185	-0.179	-0.167	-0.202*
	(0.0824)	(0.0702)	(0.0895)	(0.0646)	(0.125)	(0.112)	(0.119)	(0.119)	(0.126)	(0.115)	(0.119)	(0.119)	(0.118)	(0.114)
BTI	0.0363	0.0396	-	-	-	-	0.392	-0.450	-	-	-	-	-	-
	(0.0588)	(0.0467)					(1.720)	(1.210)						
BAI	-	-	0.0456	0.0817*	0.0440	0.0745	-	-	0.375	-0.554	-	-	-	-
			(0.0537)	(0.0424)	(0.0647)	(0.0454)			(1.296)	(1.014)				
PPI	-	-	0.0233	-0.0379	-0.0212	-0.0356	-	-	-	-	-1.152	-0.250	-	-
			(0.0569)	(0.0497)	(0.0684)	(0.0504)					(2.181)	(1.048)		
PPRI	-	-	-0.0442	-0.0378	-0.0317	-0.0518	-	-	-	-	-	-	1.119	0.749
			(0.0524)	(0.0441)	(0.0537)	(0.0431)							(1.341)	(1.022)
PAC	-2.623	-3.233*	-2.646	-2.865*	-0.968	-1.567	-1.845	-1.987	-1.723	-1.842	-0.830	-1.985	-1.980	-2.170
	(1.647)	(1.587)	(1.695)	(1.521)	(2.163)	(1.681)	(2.035)	(1.685)	(2.004)	(1.658)	(2.343)	(1.718)	(1.884)	(1.671)
TERM	-	-	-	-	4.427	0.735	3.722	0.418	3.678	0.572	4.098	0.403	4.304	0.486
					(3.494)	(1.516)	(3.183)	(1.583)	(3.287)	(1.558)	(3.341)	(1.647)	(3.088)	(1.567)
YEARS	-	-	-	-	-0.864	-0.428	-0.559	-0.236	-0.578	-0.298	-0.889	-0.225	-0.535	-0.181
					(0.637)	(0.387)	(0.567)	(0.391)	(0.549)	(0.383)	(0.697)	(0.401)	(0.522)	(0.382)
COR	-	-	-	-	7.654	6.251**	10.34	5.458	10.19	4.712	7.626	6.525	11.86**	9.845**
					(5.233)	(3.148)	(6.647)	(4.650)	(6.511)	(4.167)	(5.715)	(3.995)	(5.591)	(4.344)
BTI*COR	-	-	-	-	-	-	-0.0301	0.0359	-	-	-	-	-	-
							(0.134)	(0.0929)						
BAI*COR	-	-	-	-	-	-	-	-	-0.0280	0.0450	-	-	-	-
									(0.100)	(0.0772)				
PPI*COR	-	-	-	-	-	-	-	-	-	-	0.0895	0.0187	-	-
											(0.170)	(0.0808)		
PPRI*COR	-	-	-	-	-	-	-	-	-	-	-	-	-0.0884	-0.0601
													(0.104)	(0.0786)

Variables	Random effect[a]	Fixed effect[a]	Random effects[a]		Random effects									
Constant	28.84***	21.07**	29.91***	22.72***	-69.76	-52.85	-105.5	-44.18	-103.8	-35.27	-70.27	-56.78	-124.1*	-98.78*
	(6.455)	(8.340)	(6.568)	(4.861)	(68.95)	(38.59)	(85.44)	(58.34)	(83.98)	(52.19)	(74.58)	(49.96)	(73.78)	(54.87)
Observations	34	51	34	51	34	51	34	51	34	51	34	51	34	51
Number of states	17	17	17	17	17	17	17	17	17	17	17	17	17	17
R-squared	0.403	0.245	0.385	0.376	0.431	0.430	0.453	0.448	0.453	0.443	0.454	0.449	0.427	0.435
F/Wald Chi^2 statistic	28.46***	2.43*	28.68***	22.62***	34.57***	27.85***	34.91***	23.80***	33.65***	25.30***	35.54***	23.51***	37.01***	25.55***
F-test for homogeneity														
Hausman test	3.17[0.673]	11.83**[0.018]	4.55[0.714]	3.44[0.751]										

[a] *Preferred Model based on Hausman test; Standard errors in parentheses; p-values in brackets; *** p<0.01, ** p<0.05, * p<0.1.*

Source: Author's computation (2021).

TABLE 6

Results of panel data regression model for the 19 Northern states

Variables	Random effects[a]						Random effects					
PDS	0.0107	0.0164	0.0136	0.0198*	0.0102	0.0146	0.00880	0.0146	0.00847	0.0159*	0.00951	0.0137	0.0114	0.0153
	(0.00948)	(0.0109)	(0.0103)	(0.0113)	(0.0108)	(0.0106)	(0.00933)	(0.00922)	(0.00960)	(0.00950)	(0.00909)	(0.0101)	(0.00864)	(0.00941)
POV	-0.240***	-	-0.214***	-	-0.122	-	-0.140*	-	-0.134	-	-0.151*	-	-0.194**	-
	(0.0695)		(0.0709)		(0.0802)		(0.0798)		(0.0822)		(0.0807)		(0.0815)	
UR	0.0581	0.0513	0.0743	0.0452	-0.0439	-0.123*	-0.0737	-0.122*	-0.0521	-0.115	-0.0209	-0.120*	-0.158	-0.136**
	(0.120)	(0.0542)	(0.115)	(0.0536)	(0.128)	(0.0703)	(0.140)	(0.0709)	(0.134)	(0.0715)	(0.135)	(0.0705)	(0.135)	(0.0690)
BTI	0.140*	0.178***	-	-	-	-	-0.357	0.671	-	-	-	-	-	-
	(0.0774)	(0.0541)					(2.339)	(1.756)						
BAI	-	-	0.126*	0.117**	0.0725	0.0199	-	-	-0.122	1.044	-	-	-	-
			(0.0664)	(0.0472)	(0.0734)	(0.0497)			(2.032)	(1.399)				
PPI	-	-	-0.132*	-0.0598	-0.0827	0.00957	-	-	-	-	-0.167	-1.206	-	-
			(0.0796)	(0.0661)	(0.0844)	(0.0640)					(2.188)	(1.560)		
PPRI	-	-	0.113*	0.105*	0.0840	0.0720	-	-	-	-	-	-	-1.928	-0.248
			(0.0667)	(0.0535)	(0.0671)	(0.0494)							(1.595)	(1.062)
PAC	1.098	-0.300	-0.267	-0.676	-1.719	-0.960	-1.534	-0.597	-1.742	-0.316	-2.301	-0.488	-2.066	-1.443
	(2.681)	(2.039)	(2.618)	(2.050)	(2.848)	(1.892)	(3.007)	(2.002)	(2.991)	(1.971)	(3.253)	(1.899)	(2.905)	(2.068)
TERM	-	-	-	-	-0.723	0.403	1.601	0.346	-1.352	0.812	-0.659	1.437	-2.084	0.381
					(2.721)	(1.732)	(2.652)	(1.871)	(2.559)	(1.767)	(2.881)	(2.007)	(2.423)	(1.760)
YEARS	-	-	-	-	-0.0712	-0.186	-0.0783	-0.231	-0.0513	-0.345	-0.0376	-0.444	-0.239	-0.188
					(0.554)	(0.447)	(0.646)	(0.468)	(0.629)	(0.445)	(0.711)	(0.498)	(0.593)	(0.450)
COR	-	-	-	-	6.304*	9.218***	6.755	10.44***	7.366	12.03***	8.341**	9.346***	3.160	9.164***
					(3.415)	(2.567)	(5.490)	(3.838)	(5.759)	-	(4.141)	(2.785)	(4.528)	(3.130)
BTI*COR	-	-	-	-	-	-	0.0320	-0.0448	-	-	-	-	-	-
							(0.179)	(0.131)						
BAI*COR	-	-	-	-	-	-	-	-	0.0124	-0.0758	-	-	-	-
									(0.157)	(0.106)				
PPI*COR	-	-	-	-	-	-	-	-	-	-	0.0106	0.0940	-	-
											(0.166)	(0.116)		

Variables	Random effects[a]				Random effects									
PPRI*COR	-	-	-	-	-	-	-	-	-	-	-	-	0.155	0.0247
													(0.124)	(0.0806)
Constant	25.11***	7.092**	21.95***	6.069*	-59.54	-104.8***	-61.15	-120.2**	-69.63	-140.3***	-80.32	-103.6***	-9.591	-103.0***
	(5.913)	(3.134)	(6.047)	(3.197)	(44.19)	(31.13)	(72.21)	(49.38)	(74.48)	(49.53)	(55.00)	(35.38)	(60.61)	(39.88)
Observations	37	57	37	57	37	57	37	57	37	57	37	57	37	57
Number of states	19	19	19	19	19	19	19	19	19	19	19	19	19	19
R-squared	0.305	0.048	0.277	0.053	0.380	0.126	0.498	0.124	0.472	0.104	0.483	0.171	0.602	0.162
F/Wald Chi^2 statistic	28.99***	19.25***	40.27***	22.47***	48.52***	43.18***	36.76***	36.40***	36.45***	36.57***	34.05***	39.00***	40.26***	40.14***
F-test for homogeneity														
Hausman test	4.94[0.423]	9.07*[0.059]	13.1*[0.069]	2.54[0.864]										

[a] *Preferred Model based on Hausman test; Standard errors in parentheses; p-values in brackets; *** p<0.01, ** p<0.05, * p<0.1.*

Source: Author's computation (2021).

The findings also point out that factors that explain revenue mobilisation in a diverse country like Nigeria may vary along the regional divide. For example, population density is a major factor in the south, while poverty rate and unemployment are the strongest determinants of revenue mobilisation in the northern states. On the components of budget transparency, only overall budget transparency Index (BTI) and public availability of key budget documents (BAI) appear statistically significant in a few of the estimated models for the 36 states and the northern states. For the southern states, only BAI is marginally significant at 10 percent significance level. The results do not change even when multicollinearity is controlled for by examination of the impacts of each component in isolation, given the high correlation among them in table 3. The result could be due to the unstable progress made by the states in budget transparency. Meanwhile, with respect to corruption, the finding confirms previous works by Ghura (1998), Ajaz and Ahmad (2010), and Yaru and Raji (2022), which indicated that prevalence of corruption (control of corruption) has a negative (positive) and statistically significant effect on tax revenue performance.

In terms of a-priori expectations, all the coefficients of economic and socioeconomic variables (i.e., population density, poverty rate and unemployment) and the control of corruption conform to the expected signs in all the models. The overall significance/explanatory powers of the respective econometric models gauged by the reported F-statistics and R^2, respectively, suggest that all the models are significant and satisfactorily explain the variation in internal revenue performance of states. The R^2s of the estimated models range between 4.8 and 60.2 percent.

The results of the cross-sectional regression models presented in table A3 in appendix largely conform to the estimated panel data regression models. The results support the dominant roles of the economic factors in domestic revenue performance at sub-national level. However, contrary to the panel data models, only one component of budget transparency, i.e., public access to procurement information, appeared marginally statistically significant at 10 percent level of significance in only one of the three estimated extended models. The cross-sectional models could not accommodate the corruption variable since yearly national scores on control of corruption were used for all the states in the years covered.

6 CONCLUSION

This study examines whether or not the hypothesis that a transparent budget process results in improved revenue performance has empirical support at the sub-national level in Nigeria. Both state-level cross-sectional and panel data sets are used to test the hypothesis. The descriptive statistics suggest that on the average, both budget transparency and internal revenue mobilisation are low at the sub-national level. However, the findings from the panel data econometric analysis show that overall budget transparency has a positive and significant impact on domestic revenue mobilisation by the states. Thus, the tested hypothesis cannot be rejected, but it appears that socio-economic factors, which include population

PUBLIC SECTOR ECONOMICS
46 (4) 505-531 (2022)

density (urbanisation), poverty and unemployment, are the most consistent and dominant determinants of revenue mobilisation in all the models. The study concludes that domestic revenue mobilisation by a sub-national (state) government in Nigeria depends largely on the extent to which it increases the size of its economic base (volume of economic activities), creates employment opportunities, succeeds in fighting poverty within its jurisdiction and improves in its overall budget transparency. The study also reiterates the need to control corruption in order to make sustainable progress in revenue mobilisation at the sub-national level.

Disclosure statement

The author does not have any financial or substantive conflict of interest that might be construed as influencing the results or interpretation of his manuscript.

REFERENCES

1. Abdu, M., Jibril, A. and Muhammad, T., 2020. Analysis of tax compliance in Sub-Saharan Africa: Evidence from firm-level study. *Econometric Research in Finance*, 5(2), pp. 119-142. https://doi.org/10.2478/erfin-2020-0007
2. Abebe, G. and Fikre, S., 2020. Econometric analysis of the effects of corruption on government tax revenue: Evidence from panel data in developed and developing countries. *European Business and Management,* 6(2), pp. 28-35. https://doi.org/10.11648/j.ebm.20200602.12
3. Ade, M., Rossouw, J. and Gwatidzo, T., 2018. Determinants of tax revenue performance in the Southern African Development Community. *ERSA working paper,* No. 762.
4. Adegboyega, A., 2019. Only three of Nigeria's 36 states can survive without federal allocation – BudgIT. *Premium Times*, October 24, 2019.
5. Ajaz, T. and Ahmad, E., 2010. The effect of corruption and governance on tax revenues. *The Pakistan Development Review,* 49(4), pp. 405-417. https://doi.org/10.30541/v49i4IIpp.405-417
6. Amusa, K., Monkam, N. and Viegi, N., 2020. Can foreign aid enhance domestic resource mobilisation in Nigeria? *Journal of Contemporary African Studies,* 38(2), pp. 294-309. https://doi.org/10.1080/02589001.2020.1774519
7. Andrejovskà, A. and Pulikovà, V., 2018. Tax revenues in the context of economic determinants. *Motenegrin Journal of Economics,* 14(1), pp. 133-144. https://doi.org/10.14254/1800-5845/2018.14-1.10
8. Bastida, F. and Benito, B., 2007. Central government budget practices and transparency: an international comparison. *Public Administration*, 85(3), pp. 667-716. https://doi.org/10.1111/j.1467-9299.2007.00664.x
9. Bisogno, M. and Cuadrado-Ballesteros, B., 2021. Budget transparency and governance quality: a cross-country analysis. *Public Management Review,* 24(10), pp. 1610-1631. https://doi.org/10.1080/14719037.2021.1916064
10. Caamaño-Alegre, J. [et al.], 2013. Budget transparency in local governments: An empirical analysis. *Local Government Studies*, 39(2), pp. 182-207. https://doi.org/10.1080/03003930.2012.693075
11. Carlitz, R., 2013. Improving transparency and accountability in budget process: An assessment of recent initiatives. *Development Policy Review*, 31(S1), pp. s49-s67. https://doi.org/10.1111/dpr.12019
12. CIRDDOC, 2015. *Nigerian states budget transparency survey: 2015 report*. Civil Resources Development and Documentation Centre.
13. CIRDDOC, 2018. *Nigerian states budget transparency survey: 2018 report*. Civil Resources Development and Documentation Centre.
14. CIRDDOC, 2020. *Nigerian states budget transparency survey 2020*. Civil Resources Development and Documentation Centre.
15. Coulibaly, B. S. and Gandhi, D., 2018. Mobilisation of tax revenues in Africa: State of play and policy options. *Africa Growth Initiatives Policy Brief*.
16. Eiya, O. and America, D., 2018. Macroeconomic variables and tax revenue volatility in Nigeria. *Journal of Taxation and Economic Development,* 17(2), pp. 68-80.

17. Estrada, L. and Bastida, F., 2020. Effective transparency and institutional trust in Honduran municipal governments. *Administration and Society*, 52(6), pp. 890-926. https://doi.org/10.1177/0095399719874346
18. Ghura, D., 1998. Tax revenue in sub-Sahara Africa: Effects of economic policies and corruption. *IMF Working Paper,* WP/98/135. https://doi.org/10.5089/9781451855685.001
19. Hausman, J. A., 1978. Specification tests in econometrics. *Econometrica*, 46(6), pp. 1251-1271. https://doi.org/10.2307/1913827
20. Hu, Q. [et al.], 2020. Empirical study on the evaluation model of public satisfaction with local government budget transparency: A case from China. *SAGE Open*, 10(2). https://doi.org/10.1177/2158244020924064
21. IBP, 2019. *Open Budget Survey: Budget transparency scores*. Washington: International Budget Partnership.
22. Iniodu, P., 1999. Fiscal dependence of local governments in Nigeria's fiscal system: The case of Akwa-Ibom State. In B. E. Aigbohan, ed. 1999. *Fiscal Federalism and Nigeria's Economic Development: Selected papers for 1999 Annual Conference.* Ibadan: The Nigerian Economic Society, pp. 289-313.
23. Jahnke, B. and Weisser, R. A., 2019. How does petty corruption affect tax morale in Sub-Saharan Africa? *European Journal of Political Economy*, 60 (December, 2019). https://doi.org/10.1016/j.ejpoleco.2018.09.003
24. Karran, T., 1985. The determinants of taxation in Britain: An empirical test. *Journal of Public Policy,* 5(3), pp. 365-386. https://doi.org/10.1017/S0143814X00003160
25. Ohiokha, F. I. and Ohiokha, G., 2018. Determinants of taxable capacity in Nigeria. *Journal of Taxation and Economic Development,* 17(2), 13-25.
26. Ortega, D., Ronconi, L. and Sanguinet, P., 2016. Reciprocity and willingness to pay taxes: Evidence from a survey experiment in Latin America. *Economía,* 16(2), pp. 55-87.
27. Sun, S. and Andrews, R., 2020. The determinants of fiscal transparency in Chinese city-level governments. *Local Government Studies*, 46(1), pp. 44-67. https://doi.org/10.1080/03003930.2019.1608828
28. Transparency International, 2022. *Corruption perceptions index 2021*. Washington: Transparency International.
29. Yaru, M. A. [et al.], 2014. Budgetary institutions and fiscal discipline in Nigeria: Empirical evidence from Kwara and Kaduna States. In: S. Tella, A. G. Garba, and M. A. Adebiyi, eds. *Institutions, Institutional Reforms and Economic Development: Analytical and Policy Perspectives: Selected Papers from the 2013 Annual Conference.* Ibadan: *The Nigeria Economic Society,* pp. 163-180.
30. Yaru, M. A. [et al.], 2018. Public expenditure and inclusive growth in Nigeria. *Ilorin Journal of Economic Policy,* 5(1), pp. 46-61.
31. Yaru, M. A. and Awodun, M., 2019. Tax administration in informal sector: Kwara State Internal Revenue Service perspective. *Ilorin Journal of Economic Policy*, 6(1), pp. 1-12.

32. Yaru, M. A. and Raji, A. S., 2022. Corruption, governance and tax revenue performance in Sub-Saharan Africa. *African Journal of Economic Review*, 10(1), pp. 234-253.
33. Yaru, M. A., 2015. Buhari's victory in the 2015 presidential election: The role of socio-economic factors. *The Nigerian Journal of Economic and Social Studies,* 57(3), pp. 499-522.
34. Yaru, M., 2020. Determinants of tax collections by the local governments: Empirical evidence from Kwara State. *Journal of Taxation and Economic Development,* 19(2), pp.19-33.
35. Yaru, M. A., 2022. Addressing fiscal challenges through budget transparency: The case of Kwara State. In*:* A. M. Mainoma [et al.], eds. *Taxation for Economic Development.* Lagos. OGE Business School, Lagos, pp. 193-207.
36. Zhang, J., 2017. The illusion and the reality of Chinese budget reforms: Does budgeting influence corruption perception? *Chinese Public Administration Review*, 8(1), pp. 1-22. https://doi.org/10.22140/cpar.v8i1.3
37. Zvereva, T. [et al.], 2021. The impact of budget transparency on tax compliance, *E3S Web of Conferences 284*, 07029 (2021) TPACEE-2021. https://doi.org/10.1051/e3sconf/202128407029

APPENDIX

Table A1

Descriptive statistics for the 17 Southern states

Variable	Obs.	Mean	Std. dev.	Min	Max
SIGR	51	30.36	16.91	8.18	78.33
PDS	51	737.01	785.35	172.39	3885.7
POV	34	38.81	21.55	4.5	82.9
UR	51	30.17	15.13	9.38	57.96
PAC	51	0.61	0.49	0	1
BTI	51	34.10	18.09	7	79
BAI	51	36.24	23.13	5	86
PPI	51	25.80	21.27	0	78
PPRI	51	36.86	21.47	2	100
TERM	51	0.53	0.50	0	1
YEARS	51	3.92	2.18	1	8
COR	51	13.14	0.46	12.5	13.46

Source: Author's computation (2021).

Table A2

Descriptive statistics for the 19 Northern states

Variable	Obs.	Mean	Std. dev.	Min	Max
SIGR	57	17.20	8.16	5.45	44.57
PDS	57	179.94	139.82	52.93	735.81
POV	37	66.92	16.72	20.35	88.5
UR	57	33.41	15.03	8.37	64.75
PAC	57	0.19	0.40	0	1
BTI	57	30.89	18.28	7	90
BAI	57	35.79	21.06	8	91
PPI	57	19.79	20.40	0	100
PPRI	57	30.25	22.38	0	93
TERM	57	0.49	0.50	0	1
YEARS	57	3.81	2.31	1	10
COR	57	13.14	0.46	12.5	13.46

Source: Author's computation (2021).

TABLE A3

Cross-sectional regression results

Explanatory variables	Estimates based on 2020 data set		Estimates based on 2018 data set		Estimates based on 2015 data set	
	Model IA	**Model IIA**	**Model IB**	**Model IIB**	**Model IC**	**Model IIC**
			Dependent variable = SIGR			
Constant Intercept	34.6379*** (7.3127)	37.5208*** (7.3088)	32.0305*** (9.5070)	33.0906*** (10.1008)	28.1200*** (8.6623)	28.3605*** (9.1120)
PDS	0.0115*** (0.0029)	0.0109*** (0.0029)	0.0127*** (0.0034)	0.0122*** (0.0036)	0.0161*** (0.0034)	0.0153*** (0.0038)
POV	-0.1722** (0.0714)	-0.1960** (0.0703)				
UR	-0.2674* (0.1422)	-0.3058** (0.1407)	-0.3740* (0.1937)	-0.3873* (0.2006)	-0.7740* (0.3954)	-0.7755* (0.4120)
PAC	1.0320 (3.9323)	-1.2514 (4.0456)	-4.3758 (4.0154)	-4.7116 (4.1953)	-1.5324 (3.8702)	-1.6115 (4.0812)
BTI	0.0765 (0.1282)		0.1185 (0.1076)		-0.0231 (0.1057)	
BAI		-0.0785 (0.1157)		0.0162 (0.1175)		-0.0660 (0.1262)
PPI		-0.0115 (0.1345)		0.0620 (0.1229)		0.0494 (0.1177)
PPRI		0.2064* (0.1017)		0.0542 (0.1035)		-0.0003 (0.0978)
	No. of obs. = 35 Df (5,29) $R^2 = 0.5624$ Adj. $R^2 = 0.4869$ F(5, 29) = 7.45 Prob > F = 0.0001	No. of obs. = 35 Df (7,27) $R^2 = 0.6201$ Adj. $R^2 = 0.5216$ F(7, 27) = 6.29 Prob > F = 0.0002	No. of obs. = 36 Df (4,31) $R^2 = 0.4820$ Adj. $R^2 = 0.4152$ F(4, 31) = 7.21 Prob > F = 0.0003	No. of obs. = 36 Df (6,29) $R^2 = 0.4877$ Adj. $R^2 = 0.3817$ F(6, 29) = 4.60 Prob > F = 0.0021	No. of obs. = 36 Df (4,31) $R^2 = 0.5503$ Adj. $R^2 = 0.4943$ F(4, 31) = 9.48 Prob > F = 0.0000	No. of obs. = 36 Df (6,29) $R^2 = 0.5546$ Adj. $R^2 = 0.4624$ F(6, 29) = 6.02 Prob > F = 0.0004

*Note: Standard error in parentheses; p-values in brackets; *** p<0.01, ** p<0.05, * p<0.1.*

Source: Author's computation (2021).

PUBLIC SECTOR ECONOMICS 46 (4) 505-531 (2022)

TABLE A4

The 36 states in Nigeria

Sub-sample of 17 Southern States	Sub-sample of 19 Northern States
Abia	Adamawa
Akwa-Ibom	Bauchi
Anambra	Benue
Bayelsa	Borno
Cross River	Gombe
Delta	Jigawa
Ebonyi	Kaduna
Edo	Kano
Ekiti	Katsina
Enugu	Kebbi
Imo	Kogi
Lagos	Kwara
Ogun	Nasarawa
Ondo	Niger
Osun	Plateau
Oyo	Sokoto
Rivers	Taraba
	Yobe
	Zamfara

Source: Compiled by author based on the geographical locations of the states.

Achievements and unfinished agenda of the fiscal equalization system in Croatia

MARKO PRIMORAC, Ph.D.*
JORGE MARTÍNEZ-VÁZQUEZ, Ph.D.*
PEDRO ARIZTI, M.A.*

Article**
JEL: H73, D63
https://doi.org/10.3326/pse.46.4.5

* This paper partially builds on the results of the project "Fiscal decentralization in Croatia" (World Bank, 2021) and more specifically on the main results related to issues of fiscal equalization. However, issues like the existing inequalities in fiscal expenditure needs have been newly added. The authors would like to thank the two anonymous reviewers for their very useful comments and suggestions.

The findings, interpretations, and conclusions expressed in this article are entirely those of the author(s). They do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. Opinions and views in this article do not represent the official position of the Ministry of Finance of the Republic of Croatia, Inter-American Development Bank, European Bank for Reconstruction and Development, European Investment Bank, and World Bank.

** Received: March 16, 2022
Accepted: May 31, 2022

Marko PRIMORAC
CESifo Research Network, Poschingerstr. 5, 81679 Munich, Germany
University of Zagreb, Faculty of Economics & Business, Trg John F. Kennedy 6, 10000 Zagreb, Croatia
e-mail: mprimorac@efzg.hr
ORCiD: 0000-0003-1629-3170

Jorge MARTÍNEZ-VÁZQUEZ
International Center for Public Policy (Georgia State University), 14 Marietta Street NW, Suite557, Atlanta, Georgia, USA
Governance and Economics Research Network (GEN), Campus Universitario As Lagoas s/n, 32004 Ourense, Spain
Georgia State University, 14 Marietta Street NW, Suite557, 0303-3083 Atlanta, Georgia, USA
e-mail: jorgemartinez@gsu.edu
ORCiD: 0000-0003-2230-9204

Pedro ARIZTI
The World Bank, 1818 H Street, NW Washington, DC 20433, USA
e-mail: arizti@worldbank.org
ORCiD: 0000-0003-1312-1306

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

Abstract

Revenue sharing arrangements and the fiscal equalization system in Croatia have long been perceived as inadequate and ineffective. The reform of personal income tax sharing implemented in 2018 was accompanied by a new fiscal capacity equalization system. To date the effects of these reforms have not been empirically analyzed. In addition, the impact of the omission of differences in expenditure needs in the new formula has not been adequately analyzed either. This paper aims to fill those gaps by analyzing the existing disparities in fiscal capacity and expenditure needs across subnational governments in Croatia, testing the effectiveness of the current fiscal equalization mechanisms. Using Gini coefficients and other inequality measures we confirm that the new fiscal equalization does reduce disparities in per capita fiscal capacity. However, its equalizing effectiveness regarding expenditure needs arising from decentralized functional responsibilities remains overall rather weak.

Keywords: equalization transfers, fiscal capacity, expenditure needs, intergovernmental fiscal relations, Croatia

1 INTRODUCTION

Fiscal equalization at the subnational level has not been widely researched in Croatia. Just a few scientific papers have been devoted to this topic. Bajo and Bronić (2007) made one of the first contributions by showing empirically that the allocation of fiscal equalization instruments in Croatia was not associated with the fiscal capacities of local government units (LGUs), and conjecturing that the fiscal equalization system had not been effective. Bronić (2008, 2010) went a step further and empirically confirmed these conjectures, but only at the county (regional) level. Later, Primorac (2014) confirmed that the then-existing model of fiscal equalization was also ineffective at the level of LGUs, i.e., cities and municipalities. However, all this work has been focused mostly on the equalization of fiscal capacity, whereas the disparities in expenditure needs have been mostly neglected. At that time, the equalization of fiscal capacities relied on two main fiscal instruments – tax sharing and the disbursement of several types of grants. Surprisingly, the criteria for applying these instruments were predominantly based on geographical or historical features (based on the beneficial status of the so-called areas of special national concern – ASNC, hill and mountain areas – HMA, islands, etc.)[1], and not so much on economic and fiscal features.[2]

Building on these empirical findings, but based on well-known international contributions (such as Martinez-Vazquez and Timofeev, 2008; Spahn, 2007; Shah, 2007; Boadway, 2004, 2007; Dafflon, 2007; Buchanan and Wagner, 1970; Rao, 2007; Slack, 2007 and Vigneault, 2007), Primorac (2014) called for the restructuring of

[1] For details see Primorac (2014 and 2015).

[2] There are also other significant domestic contributions dealing with similar topics, such as Jurlina Alibegović, Slijepčević and Kordelj-De Villa (2013), Hodžić and Muharemović (2019), Jurlina Alibegović, Hodžić and Bečić (2019), Bronić (2020), Hodžić and Paleka (2020), as well as Škarica (2021).

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

the fiscal equalization system in Croatia, proposing " …a system of partial equalization of fiscal capacities through equalizing the potential revenues from the personal income tax (PIT) and surtax (assuming the maximum surtax rates) and thus putting all local and regional government units (LRGUs) on an equal footing in financing capacity (excepting the City of Zagreb). Equalization is to be carried out vertically – through current general (unconditional) grants from the central government budget."

A variation of this model was actually implemented in 2018 through the amendment of the Law on Financing of Local and Regional Self-Government Units (OG 127/17). That was accompanied with a wider tax reform, with a simpler, more understandable and generally fairer system of distribution of PIT revenues, implemented by applying a uniform allocation scheme for all LRGUs. The main goal of this paper is to test the effectiveness of the new fiscal equalization model and identify potential areas for improvement. Furthermore, keeping in mind that the system has been restructured only from the point of view of fiscal capacity equalization, the paper examines the need and possibilities for restructuring the fiscal needs side of the equalization system as well.

The equalization of fiscal needs in Croatia has been implemented only for the newly decentralized functions (elementary education, secondary education, social welfare, healthcare and firefighting – all functions that were decentralized after 2001) through setting minimum financial standards and disbursing equalization grants for those decentralized functions.[3] However, the effectiveness of this system has never been thoroughly researched. One question examined in this paper is the need for introducing a more comprehensive system of expenditure needs equalization. That is, a system that would include not only the newly decentralized functions but also other services for which LRGUs have been traditionally responsible. We do that from the perspective of the fiscal gap approach, which considers both the disparities in fiscal capacity and expenditure needs.[4] An important effect of including the broader scope of subnational public services is that the new equalization system that includes expenditure needs would apply to all LRGUs and not only to those few (with stronger capacities) that took over the newly decentralized functions.

In order to examine the need for mitigating inequalities in fiscal needs between LRGUs, we calculate fiscal inequalities in per capita expenditure for the most prominent public services for counties, cities and municipalities. Over the years, numerous authors have used a variety of numerical, as well as graphical, methods for measuring fiscal disparities or inequalities across local governments (see, for example, Bird and Tarasov, 2002; Portnov and Felsenstein, 2010 and Cowell,

[3] A more detailed description of this system is provided in section 5, as much of it is still in operation.
[4] Even though the equalization system proposed by Primorac (2014) relied exclusively on mitigating differences in fiscal capacities, it also called for further research with the aim of examining the opportunities and constraints of expanding the system to the equalization of fiscal or expenditure needs.

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

2009 for the elaboration of some of those measures). Overall, Gini coefficients (Gini, 1912, 1921) and Lorenz curves (Lorenz, 1905) turned out to be the most common tools used in the empirical literature (see, for example, Shankar and Shah, 2003; Blöchliger, 2014; UN-Habitat, 2012; Hierro, Atienza and Patiño, 2007 and Spiezia, 2003). We will also employ these measures to analyze fiscal inequalities in Croatia.

The rest of the paper is organized as follows. The second section describes the current system of revenue assignments and tax sharing arrangements. The third section is devoted to analyzing the effectiveness of the current fiscal capacity equalization system in Croatia. Section four reviews the current expenditure assignments and evaluates inequalities in expenditure per capita for selected public functions, while section five analyzes the effectiveness of the current equalization grants for decentralized functions. Section six concludes and contains policy implication and recommendations.

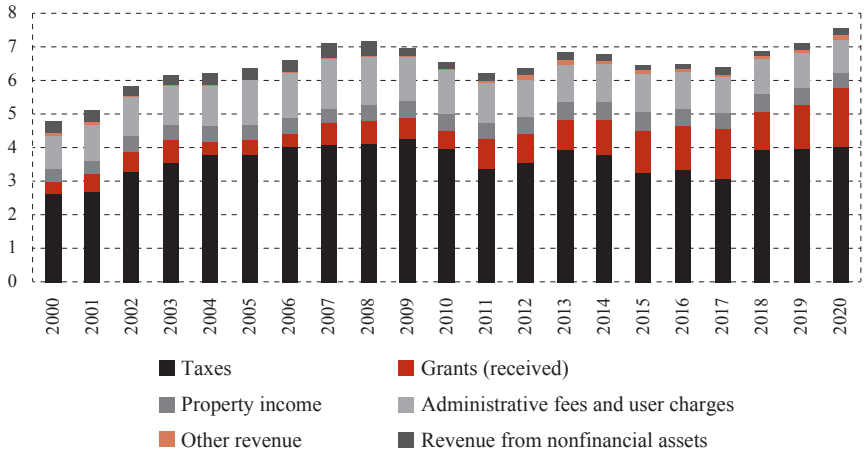
2 REVENUE AND TAX SHARING

The LRGU financing system in Croatia is still developing. Since 2001, when the fiscal decentralization process formally began, LRGU revenue has increased significantly – from 4.8% of GDP in 2000 to 7.6% of GDP in 2020 (figure 1). Current revenues, as expected, mainly dominate the structure of total LRGU revenue, with the share of capital revenues from the sales of non-financial assets almost being negligible. By far the most significant source of LRGU revenue is from taxes (accounting for almost 60 percent of total), followed by administrative fees and user charges (over 15 percent) that relate primarily to utility fees and contributions. Grants or transfers (received) also have a significant share of over 15 percent. Other categories of revenue are less significant (together with revenues from the sale of non-financial assets, they amount to about 10 percent of total LRGU revenue). The fragmented institutional arrangement between larger and smaller units and relatively richer or poorer areas in terms of tax bases has largely been reflected in the LRGU financing systems. Unsurprisingly, the adequacy of current revenue assignments differs significantly across units.

With a combined share of almost 90 percent, PIT (which is basically a central government tax with shared revenues distributed to LRGUs based on a defined tax sharing schedule) and surtax are the main sources of LRGUs' tax revenues (figure 2). Personal income tax became a particularly important source of LRGU financing from 2007 onward. Since then, the central government has entirely renounced its own sharing in any revenue from PIT, but at the same time, it completely (and also very properly) centralized the revenue from corporate income tax (CIT), which had previously been shared among the state, counties, cities, and municipalities.

Figure 1

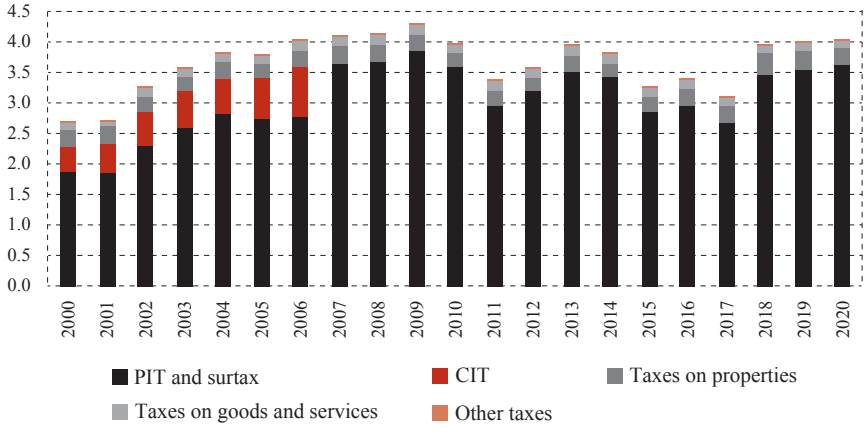
LRGU revenue sources from 2000 to 2020 (in % of GDP)



Source: Authors' calculation, based on the data from the Report on revenues and expenditures, receipts and expenses (Form PR-RAS) for the years 2000-2020.

Figure 2

LRGU tax revenue from 2000 to 2020 (in % of GDP)



Source: Authors' calculation, based on the data from the Report on revenues and expenditures, receipts and expenses (Form PR-RAS) for the years 2000-2020.

Currently, the PIT revenue is shared in such a way that 74% belongs to the municipality or city on a derivation basis (or where the tax is collected), 20% goes to the county in which the local government is located, whereas the remaining share of 6% is allocated (also on a derivation basis) to those LRGUs that have taken over the financing of newly decentralized functions, with different percentages for each transferred function. For elementary education, it is 1.9 percent; secondary education, 1.3 percent; social care, 0.8 percent (centers for social care 0.2 percent, nursing homes 0.6 percent); health care, 1.0 percent; and firefighting, 1.0 percent (public fire departments). Importantly, the revenue collected from the additional PIT

shares for decentralized functions is earmarked for financing the minimum financial standard for each of these functions.[5]

The historical evolution for the general sharing scheme of the PIT is summarized in table 1. It has to be noted that previously, special (favorable or beneficial) tax sharing arrangements existed for LGUs in ASNC and HMA until 2015, as well as for certain LGUs on islands and in what are called supported areas until 2018.

Table 1

General PIT sharing scheme (in %)

Period (d/m/yyy)	Central government	County	City/ municipality	Decentr. functions	Equalization fund for decentr. functions	EU projects
1/1/1994 – 1/4/2000	70	5	25			
1/4/2000 – 1/7/2001	60	8	32			
1/7/2001 – 1/1/2002	29.2	8	32	9.8	21	
1/1/2002 – 1/1/2003	29.6	8	32	9.4	21	
1/1/2003 – 1/1/2007	25.6	10	34	9.4	21	
1/1/2007 – 1/7/2008		15	52	12	21	
1/7/2008 – 1/3/2012		15.5	55	12	17.5	
1/3/2012 – 1/1/2015		16.0	56.5	12	15.5	
1/1/2015 – 1/1/2018		16.5	60	6	16	1.5*
1/1/2018 – 1/1/2021		17	60	6	17**	
1/1/2021 –		20	74	6		

*Notes: * Share for projects co-financed by European structural and investment funds led by municipalities, cities and counties, legal entities under their majority ownership or co-ownership and institutions they founded; ** Share for financing the fiscal equalization system.*[6]

Source: Law on Financing of Local and Regional Self-Government Units (OG 117/93, 33/00, 59/01, 107/01, 117/01, 150/02, 147/03, 132/06, 73/08, 25/12, 147/14, 100/15, 115/16 and 127/17, 138/20).

Through these beneficial tax sharing arrangements, the government was trying to mitigate fiscal inequalities. However, the effectiveness of such arrangements was weak because the criteria for granting the preferential treatment within the tax sharing scheme were inadequate from a fiscal equalization perspective. With the amendments to the Law on Financing Local and Regional Self-Government Units (OG 127/17), a simpler, more understandable and generally fairer system of distribution of PIT has been established. All PIT revenue is left to LRGUs, and the distribution of PIT revenue is simplified by applying a uniform allocation scheme for all LRGUs. There are no exceptions and all units are covered with the same (uniform) tax schedule, including those in HMA, ASNC and islands, as well as those in the supported areas that had previously enjoyed preferential treatment in the PIT revenue sharing system.

[5] The minimum financial standards and the financing of decentralized functions are further discussed in section 5.

[6] Until 2018, funds within this category were used to finance equalization grants for decentralized functions. However, since 2018 the central government has taken over the equalization funding for decentralized functions leaving this share of PIT for funding the newly-established fiscal equalization scheme.

Also, with the new distribution of the PIT, both the share for financing the equalization grants for the newly decentralized functions and the share for financing the newly established fiscal capacity equalization scheme ceased to exist. The fiscal equalization system is now completely financed from the state budget, and that includes the equalization grants for decentralized functions (since 2018) and the fiscal capacity equalization system (since 2021). The appropriation of 1.5% of PIT for EU projects as well as the shares intended for capital projects for the development of the municipalities and cities in the HMA and islands have been abolished. The funds for these purposes have been provided in the state budget from the general budget revenues since 2018.

3 FISCAL CAPACITY EQUALIZATION

Due to the different conditions in which individual areas have developed, local and regional self-government units differ in the degree of economic development, in their tax bases, and therefore in their ability to raise revenues from the taxes that have been assigned to them. In other words, not all LRGUs are able independently (without central government assistance) to provide an adequate level of public services to all their citizens (exercising a comparable level of tax collection effort). The LRGU financing system has undergone significant changes in this regard by the amendment of the Law on Financing of Local and Regional Self-Government Units (OG 127/17), when a completely new model of fiscal equalization was created that allowed for greater levels of fiscal equalization, especially among cities and municipalities.

According to the new Law, municipalities, cities and counties whose capacity to generate tax revenue is less than the reference value for the capacity of generated tax revenue become eligible (or exercise the right) to receive fiscal equalization funds. To allocate these funds, three separate equalization systems have been introduced, each for one group (level) of local government units – counties, cities and municipalities. It is important to point out here that the equalization system for reasons of simplicity (that is, avoiding the difficulty of estimating the fiscal capacity or potential revenues from all own revenue sources[7]) focuses exclusively on PIT revenue sharing and the surtax. Despite the omission of other own revenue capacity, this approach tends to provide satisfactory results because PIT sharing and the surtax account for about 90% of LRGU total tax revenue. However, since the (omitted) fiscal capacity from own revenues is much more important proportionally for relatively richer jurisdictions, this approach tends to "punish" relatively poorer jurisdictions with lower tax bases, which artificially appear to have relatively higher tax capacity than they really do.

The so estimated (partial) fiscal capacity of LRGUs is based on the five-year average of the potentially collected PIT and surtax per capita that would be achieved if the highest surtax rate was applied. The benchmark (i.e., the reference value of the

[7] Own revenue refers to the revenue from county, city or municipal taxes, administrative fees, user charges, revenue from own property, fines and other own revenue sources.

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

capacity of generated tax revenue) is selected as the average fiscal capacity per capita of all government units of the same level. In other words – a separate benchmark has been determined for each group of units – counties, cities and municipalities. The City of Zagreb is – due to its disproportionally high fiscal capacity[8] – excluded from the calculation. In addition, the benchmark for municipalities is adjusted (the average fiscal capacity is increased) by 50% to equalize the huge difference of reference values between cities and municipalities in general.

The fiscal equalization model incorporated in the new LRGU financing system is based on several important variables. The funds distributed to LRGUs through the fiscal equalization system are unconditional or non-earmarked revenues (grants from the central government budget), which is a conventional feature of equalization grants in the vast majority of countries. The distribution formula is based on two criteria: (i) the capacity of the generated tax revenue (based on PIT sharing and surtax only), and (ii) the reference value of the capacity of generated tax revenues.

More specifically, the measure of fiscal capacity is calculated for each LRGU as follows.

The capacity of generated tax revenues of a municipality or city is a five-year moving average of revenue from PIT generated in the territory of a municipality or city, as well as from the surtax that a municipality or city would achieve by introducing the highest allowed rate of surtax per capita of each municipality or city:

$$cgtr_{mu,ci} = \frac{1}{5}\sum_{t=1}^{5} pit_{mu,ci,t} \times (1 + \widehat{st}_{mu,ci,t}) \quad (1)$$

where $cgtr_{mu,ci}$ denotes the capacity of generated tax revenue of a municipality or city per capita, $pit_{mu,ci,t}$ per capita revenue from PIT of municipality or city in the period t and $\widehat{st}_{mu,ci,t}$ potential (estimated) surtax that a municipality or city would achieve by introducing the highest allowed rate of surtax per capita in the period t.

The capacity of generated tax revenues of a county is a five-year moving average of revenue from the PIT generated in the individual county, multiplied by the proportion (currently 20%) that belongs to counties based on the distribution of PIT revenue per capita in that county:

$$cgtr_{co} = \frac{0.20}{5}\sum_{t=1}^{5} pit_{co,t} \quad (2)$$

where $cgtr_{co}$ denotes the capacity of generated tax revenue of a county per capita, $pit_{co.t}$ per capita revenue from the PIT of a county in the period t.

[8] More than one quarter of all LRGUs' current revenue in 2018 is related to Zagreb. All municipalities and counties combined together generated in the same year slightly more current revenue than Zagreb alone. The divergence of Zagreb's fiscal capacity (from that of other LRGUs) is significant also in per capita terms. Fina lly, the unique possibility to introduce surtax of up to 18% (the maximum rate for other cities is 15%) makes Zagreb an outlier in every sense. If Zagreb were included in the calculation of the reference value it would skew the average upwards so most of cities would turn out to be below average.

The reference value of the capacity of generated tax revenues is calculated separately for all municipalities, for all cities, and for all counties as follows.

The reference value of the capacity of generated tax revenues for municipalities is a five-year average of the revenue from PIT generated in all municipalities and of revenues achievable using the highest statutory surtax rate, per capita of all municipalities, which is increased by 50% of the value thus obtained:

$$rv(cgtr)_{mu} = \frac{1.5}{428} \sum_{i=1}^{428} cgtr_i \tag{3}$$

where $rv(cgtr)_{mu}$ denotes the reference value of the capacity of generated tax revenues for municipalities and $cgtr_i$ the capacity of generated tax revenue of a municipality i.

The reference value of the capacity of generated tax revenues for cities is a five-year average of the revenue from the PIT generated in all cities and of revenues achievable using the highest statutory surtax rate, per capita of all cities.

$$rv\left(cgtr\right)_{ci} = \frac{1}{127} \sum_{i=1}^{127} cgtr_i \tag{4}$$

where $rv(cgtr)_{ci}$ denotes the reference value of the capacity of generated tax revenues for cities and $cgtr_i$ the capacity of generated tax revenue of a city i.

The reference value of the capacity of generated tax revenues for counties is the five-year average of the revenue from the PIT generated in all counties, multiplied by the county share of personal income tax revenue, per capita of all counties.

$$rv(cgtr)_{co} = \frac{0.20}{20} \sum_{i=1}^{20} cgtr_i \tag{5}$$

where $rv(cgtr)_{co}$ denotes the reference value of the capacity of generated tax revenues for counties and $cgtr_i$ the capacity of generated tax revenue of a county i.

Municipalities, cities and counties whose generated tax revenue capacity is lower than the reference value of the generated tax revenue capacity are the only ones entitled to fiscal equalization funds. The full fiscal equalization funds for a particular municipality, city or county represent the difference between the reference value of the capacity of generated tax revenues for municipalities, cities or counties and the capacity of generated tax revenues of each municipality, city or county multiplied by the total population of that municipality, city or county. Again, if the generated tax revenues capacity a particular LRGU is greater than the corresponding reference value of the capacity of generated tax revenues, the unit is not entitled to fiscal equalization funds.[9] The sum of all full fiscal equalization funds is the total value (financing) of the fiscal equalization system, as shown below:

[9] Importantly, there is no Robin Hood (or "fraternal" funding) element in the current fiscal equalization system. LRGUs that are not eligible to receive equalization transfers do not have to contribute any of their "surplus" to the pool of equalization funds.

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

$$\widehat{FFE}_{mu} = f(x) = \begin{cases} \sum_{i=1}^{428} \left[rv(cgtr)_{mu} - cgtr_i \right] \times pop_i, \; cgtr_i < rv(cgtr)_{mu} \\ 0, \; cgtr_i \geq rv(cgtr)_{mu} \end{cases} \tag{6}$$

$$\widehat{FFE}_{ci} = f(x) = \begin{cases} \sum_{i=1}^{127} \left[rv(cgtr)_{ci} - cgtr_i \right] \times pop_i, \; cgtr_i < rv(cgtr)_{ci} \\ 0, \; cgtr_i \geq rv(cgtr)_{ci} \end{cases} \tag{7}$$

$$\widehat{FFE}_{co} = f(x) = \begin{cases} \sum_{i=1}^{20} \left[rv(cgtr)_{co} - cgtr_i \right] \times pop_i, \; cgtr_i < rv(cgtr)_{co} \\ 0, \; cgtr_i \geq rv(cgtr)_{co} \end{cases} \tag{8}$$

$\widehat{FFE}_{mu}$, $\widehat{FFE}_{ci}$ and $\widehat{FFE}_{co}$ denote estimates of full fiscal equalization funds for municipalities, cities and counties respectively, $rv(cgtr)_{mu}$, $rv(cgtr)_{ci}$ and $rv(cgtr)_{co}$ reference values of the capacity of generated tax revenues for municipalities, cities and counties per capita, $cgtr_i$ per capita capacity of generated tax revenue of a municipality, city or a county i and pop_i population of a municipality, city or a county i.

The actual amount of fiscal equalization funds that each LRGU will receive depends on the total pool of funds for fiscal equalization *FEC* determined annually by the decision of the minister of finance. This certainly leaves room for improvement. International practice suggests that the better standard is to use a formula-based approach, for example, as a share of total central government revenues, to automatically determine the pool of available funds. The advantage of this approach is in making the funds predictable (and likely more stable), thus helping the LRGUs to plan their budgets better.

The total amount of funds needed for fiscal equalization is equal to the sum of funds needed for fiscal equalization in the full amount of all LRGUs.

$$\widehat{FFEF} = \widehat{FFE}_{mu} + \widehat{FFE}_{ci} + \widehat{FFE}_{co} \tag{9}$$

Where $\widehat{FFEF}$ denotes the total estimated funds required for full fiscal equalization of municipalities, cities and counties, and $\widehat{FFE}_{mu}$, $\widehat{FFE}_{ci}$ and $\widehat{FFE}_{co}$ are estimates of full fiscal equalization funds for municipalities, cities and counties respectively.

The share of funds needed for the fiscal equalization of each LRGU in the total sum of the funds needed for the fiscal equalization of all LRGUs represents the share of each unit on the basis of which it will receive the fiscal equalization grant. That is:

$$FEG_i = FEC \times S_i; \quad S_i = \frac{\widehat{FFE}_i}{\widehat{FFEF}} \tag{10}$$

Where FEG_i denotes the value of the fiscal equalization grant for a LRGU i, *FEC* the actual capacity of the fiscal equalization fund and S_i the share of LRGU i in the fiscal equalization fund.

The funds to be distributed to each LRGU depend, therefore, on the amount of the share calculated for each LRGU and on the funds available for fiscal equalization – determined each year by the decision of the minister of finance (HRK 2 billion in 2021). In other words, when the total pool of equalization funds is not sufficient to cover all the gaps vis-à-vis particular reference levels, then the available funds are distributed proportionally to the size of the gaps across levels of government (groups of units) and within each level also proportionally to the gap for each jurisdiction. The share of funds required for full fiscal equalization of a municipality, city and county in the total required fiscal equalization funds for all municipalities, cities and counties, as well as the capacity of generated tax revenues and the reference value of the capacity of generated tax revenues, is determined for each fiscal year.

LRGUs that are entitled to the funds of fiscal equalization are allocated a monthly payment (before the 15th day in the current month). As noted above, the equalization transfers are non-earmarked grants from the central government budget. Thus, LRGUs have the freedom to direct the funds received for the purposes they identified as most needed.

Interestingly, for 2020, according to the Ministry of Finance's calculations, there are only 82 municipalities, 40 cities and 5 counties outside the fiscal equalization system.[10] This confirms, on the basis of the current formula, a significant asymmetry or large disparities in fiscal capacity between local and regional governments with regard to the possibility of providing a comparable level of public services with a comparable tax burden across all LRGUs.

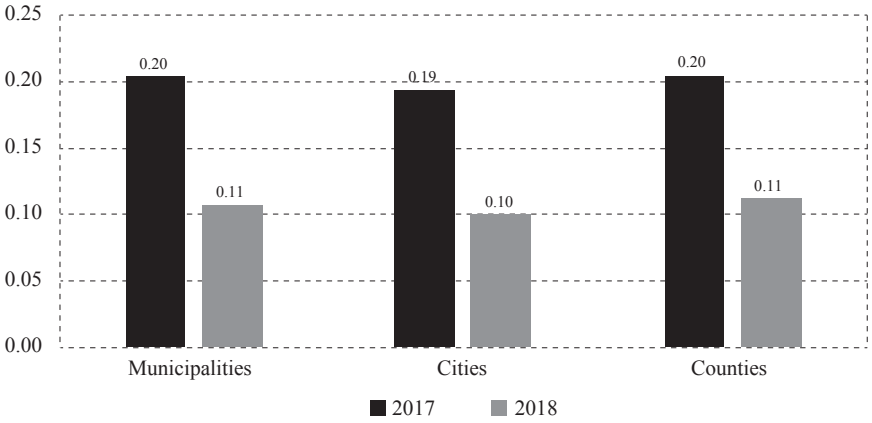
The effectiveness of the new fiscal equalization system in comparison with the old one is presented by Gini coefficients (figure 3). The Gini coefficient is a common measure used to represent (fiscal) inequalities. It ranges from 0 to 1, with 0 indicating complete equality and 1 total inequality. The Gini coefficients compared in the figure 3 are computed for cities, municipalities and counties on the basis of the PIT and surtax, compensatory grants and grants established by the State Budget Execution Law for 2017 (under the old system) and 2018 (under the new system). With the implementation of the new fiscal equalization system, fiscal inequalities in terms of fiscal capacity (defined as currently in the law) have been almost halved at all levels of local and regional public authority.

[10] Table of LRGUs' share for fiscal equalization in 2020 is available at: https://mfin.gov.hr/istaknute-teme/lokalna-samouprava/fiskalno-izravnanje/202.

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

FIGURE 3

Gini coefficients of the distribution of PIT and surtax and fiscal equalization funds per capita in 2017 and 2018

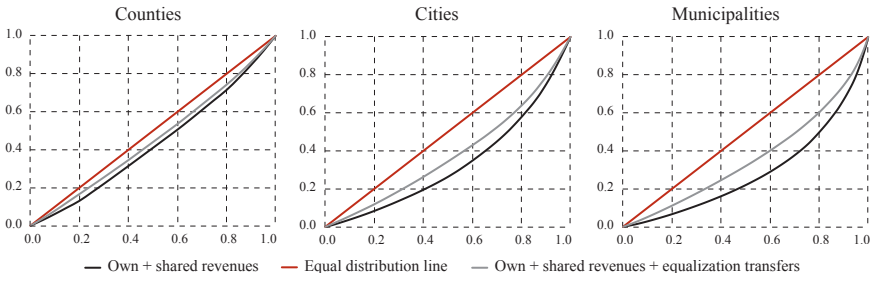


Source: Authors' calculation based on the data from the Report on revenues and expenditures, receipts and expenses (Form PR-RAS) for the years 2017 and 2018.

The effectiveness of equalization transfers can also be presented graphically with Lorenz curves. Figure 4 shows how the distribution of revenues gets closer to the (diagonal) equal distribution line after the disbursement of equalization transfers.

FIGURE 4

Lorenz curves of disparities in per capita fiscal capacities in 2018



Source: Authors.

Although comparisons in figures 3 and 4 give a sense of the relative effectiveness of the new equalization system, the overall results are not completely credible because there might be also other factors influencing different revenue components, for example those currently not being considered in the equalization formula and consequently affecting the computed Gini coefficients. To approximate the presence of this potential issue, table 2 shows various dispersion measures for certain components of LRGU revenues and expenditures. This table enables us to get a better look at what the disparities are with own and shared revenues[11] and

[11] Shared revenues refer here to the PIT revenue (both the PIT revenue collected according to a uniform sharing scheme and the additional part of the PIT revenue for the optional decentralized functions taken over).

how much equalization transfers can reduce those disparities, as well as how these disparities are then maintained or made worse by other transfers.

Table 2

Comparative effects on per capita fiscal disparities in 2018

	Own revenues	(1) + shared revenues	(2) + equalization transfers	(3) + other transfers	Expenditures
	(1)	(2)	(3)	(4)	(5)
Counties					
Min, HRK	156.8	352.5	503.5	999.8	1,049.4
Max, HRK	489.2	956.2	956.2	2,941.7	2,757.0
Range (max – min), HRK	332.4	603.7	452.7	1,941.8	1,707.6
Average, HRK	323.4	595.6	660.2	1,392.8	1,382.2
Median, HRK	329.2	569.5	628.2	1,275.6	1,288.2
Standard deviation, HRK	83.8	156.9	113.3	421.4	376.9
Coefficient of variation (%)	25.9	26.3	17.2	30.3	27.3
Gini coefficient	0.142	0.138	0.088	0.126	0.114
Cities					
Min, HRK	469.5	972.0	2,364.8	2,405.4	2,029.9
Max, HRK	9,538.8	10,912.2	11,042.2	12,031.3	14,053.9
Range (max – min), HRK	9,069.3	9,940.2	8,677.4	9,625.9	12,023.9
Average, HRK	2,440.0	3,803.1	4,571.0	5,401.4	5,316.2
Median, HRK	1,584.4	2,887.4	3,817.9	4,821.5	4,695.0
Standard deviation, HRK	2,096.6	2,469.5	2,115.6	2,213.5	2,502.8
Coefficient of variation (%)	85.9	64.9	46.3	41.0	47.1
Gini coefficient	0.429	0.336	0.233	0.218	0.247
Municipalities					
Min, HRK	104.5	464.5	1,543.7	1,726.0	1,495.4
Max, HRK	13,934.2	15,855.1	15,855.1	26,749.9	29,477.4
Range (max – min), HRK	13,829.7	15,390.6	14,311.4	25,023.9	27,981.9
Average, HRK	1,955.0	2,815.3	3,738.7	4,839.9	4,741.0
Median, HRK	991.5	1,792.0	2,872.4	3,847.6	3,758.1
Standard deviation, HRK	2,313.3	2,616.7	2,310.6	2,995.4	3,167.8
Coefficient of variation (%)	118.3	92.9	61.8	61.9	66.8
Gini coefficient	0.523	0.425	0.277	0.281	0.303

Source: Authors.

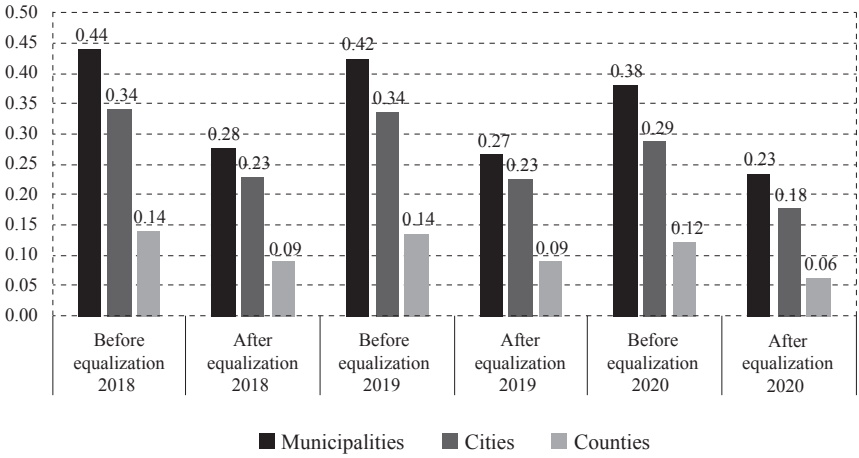
Gini coefficients for all categories of LRGUs (counties, cities and municipalities) significantly decrease with the distribution of the equalization transfers. For counties from 0.138 to 0.088, for cities from 0.336 to 0.233 and from 0.425 to 0.277 for municipalities. This shows that, despite its shortcomings (it ignores, for example, the full fiscal capacity from own revenues), the current fiscal (capacity) equalization system effectively performs a redistributive function. Also of note is that other transfers significantly increase disparities for counties, whereas for cities and municipalities – disparities are, more or less, maintained by other transfers.

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

These results are confirmed also in figure 5, which shows Gini coefficients of fiscal disparities in per capita current own revenues of LRGUs before and after the distribution of the fiscal equalization funds. Current own revenues referred to here, actually include own revenues and shared revenues from table 2 reduced by revenues from the sale of nonfinancial assets (capital revenue), as these are exceptional revenues LRGUs cannot count on each year.

FIGURE 5

Gini coefficients of the distribution of current own revenues and fiscal equalization funds per capita from 2018 to 2020



Source: Authors.

Disparities in LRGU fiscal capacities per capita are significantly reduced after the allocation of the fiscal equalization grants on all levels of government. Moreover, fiscal inequalities (at least from the fiscal capacity perspective) decrease constantly in the observed period each year both before and after the equalization. Whether this is one of the beneficial long-term consequences of the new fiscal equalization system can be confirmed in future research, but the empirical literature covering the experience of other countries has revealed many beneficial as well as several adverse effects of fiscal equalization grants (Lago and Lago-Peñas, 2022). In any case, it might be that the allocation of fiscal equalization grants gives additional fiscal space to otherwise underperforming LRGUs for carrying productive expenditures with a positive impact on their longer-term fiscal capacities.

4 DECENTRALIZED FUNCTIONS AND EXPENDITURE ASSIGNMENTS

After the constitutional changes in 2000, the self-governing scope of Croatia's municipalities, cities, and counties was determined by the application of the general clause for residual powers in expenditure assignments. Contrary to the concept of administrative decentralization adopted in the previous period, the constitutional changes recognized the legal personality and autonomy of subnational authorities in decision making and management of their affairs. State control over LRGUs became limited to verifying the constitutionality and legality of their actions. By introducing

the residual powers general clause, according to which the presumption of authority over local affairs is on the side of subnational units, the range of tasks over which LRGUs have jurisdiction became widely defined. Moreover, LRGUs independently dispose of their own income, are authorized to adopt general acts for their independent internal organization and their administrative bodies, and are given the opportunity to cooperate at the national and international levels. Municipalities and cities perform tasks of local importance, and counties perform tasks of regional significance that otherwise are not assigned to state (central government) bodies. This potentially provides a very wide scope of responsibilities.

The process of fiscal decentralization (since 2001) has enabled LRGUs to take on authority for the provision and financing of significant newly decentralized functions, including health care, education, social welfare, and fire protection services, from the central government. The assignment of newly decentralized functions (expenditure responsibilities) to LGUs has not been mandatory but rather voluntary. This has led to an asymmetric assignment, with different cities and municipalities in charge of different services and some regional government (counties) still in charge of providing many services that in other areas or counties have been effectively decentralized. Only a minority of cities (around one quarter) with higher fiscal capacities have taken on these optional functional assignments. Where the LGUs have not taken over the newly (optional) decentralized functions, the tasks are performed by their respective counties. Thus, in another way of looking at it, there has been a de facto upward delegation among those cities and municipalities that decided not to take on certain types of services. Perhaps the most important policy implication of this asymmetric assignment is that Croatia has indeed found a very effective way (if not necessarily the most correct one) of dealing with the lack of administrative capacity of many small fragmented local governments.

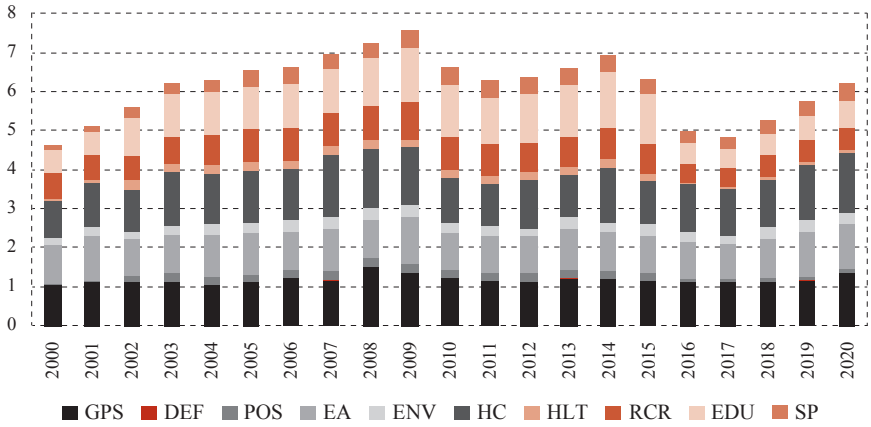
The structure of LRGU expenditure by functional budget classification reveals the intensity of performing various functions and service delivery at the subnational level. This is especially helpful in understanding the respective roles of the different tiers of government in the provision of services where there are concurrent or overlapping responsibilities. The largest share of LRGU expenditures, with regard to functions, is for housing and communal amenities and general public (administrative) services (figure 6). The temporal evolution of LRGUs with regard to decentralized functions also reflects the policy changes in assignments and the corresponding sources of financing. Since 2001, the budget items for decentralized functions have increased considerably, as the financing of the major part of education, health care, social protection, and firefighting was transferred to LRGUs.

As noted, amendments to the Law on Financing of Local and Regional Self-Government Units in 2001 and 2003 and amendments to special laws created the legal preconditions for the decentralization of primary and secondary education, social welfare, health, and firefighting functions (public fire departments) to LRGUs. As already mentioned, these (optional) newly decentralized functions are financed through the increased share of PIT revenue allotted to LRGUs (assigned for each

function assumed) and also through equalization grants for decentralized functions (in the event that LRGUs cannot meet the minimum financial standards).

Figure 6

LRGUs' functional expenditure from 2000 to 2020 (in % of GDP)



Note: GPS: general public services, DEF: defense, POS: public order and safety, EA: economic affairs, ENV: environment, HC: housing and community, HLT: health, RCR: recreation, culture, and religion, EDU: education, SP: social protection.

Source: Authors' calculation, based on the data from the Report on revenues and expenditures, receipts and expenses (Form PR-RAS) for the years 2000-2020.

The functional dimension of expenditures reveals evident disparities among LGUs (table 3). It is surprising that the minimum value for all functional expenditure components is zero, though this is usual for certain naturally centralized functions (such as defense). However, it is difficult to believe that in some LGUs, there is no expenditure for such functions as general public services, economic affairs, or housing and community affairs. It is possible that there are problems in recording these values (functional classification of expenditures) in certain LGUs with weaker administrative capacities. Functional expenditure distribution disparities are less pronounced at the regional (county) level.

In order to create a clearer image of inequalities in service provision at the local level, a separate analysis needs to be conducted for each service because the aggregate figures presented above do not reveal much, since several important functions are reported under each category of functional classification. and in addition, in the case of the newly decentralized functions, naturally those jurisdictions without the decentralized functions cannot be compared with those that have taken them on.

With this aim, below we first decompose functional expenditure for counties, cities and municipalities to find the most significant expenditure items, and then proceed with the calculation of inequality measures for these identified functions. Table 4 shows the most significant functional expenditure categories for counties including: general public services, health, primary and secondary education and social protection.

Table 3

Summary statistics of LRGUs' functional expenditure components per capita in 2018 (in HRK)

	Max	Min	Average	Median	St. dev.	Coeff. of variation (%)
Local government units (cities and municipalities)						
GPS	15,242.7	0.0	1,180.8	935.8	1,066.2	90.3
DEF	211.5	0.0	2.5	0.0	12.9	507.9
POS	2,056.4	0.0	125.6	90.5	140.7	112.0
EA	28,563.0	0.0	936.0	615.1	1,551.9	165.8
ENV	4,575.0	0.0	234.1	85.1	447.5	191.2
HC	9,449.6	0.0	1,184.4	885.2	1,172.9	99.0
HLT	408.4	0.0	18.4	2.5	36.0	195.0
RCR	6,007.4	0.0	381.3	246.3	529.4	138.8
EDU	6,431.5	0.0	281.4	184.8	425.0	151.0
SP	10,840.2	0.0	221.1	134.8	500.0	226.1
Total	29,477.4	1,465.9	4,565.6	3,699.2	2,944.1	64.5
Regional government units (counties)						
GPS	353.7	125.7	207.9	186.4	65.6	31.6
DEF	1.0	0.0	0.1	0.0	0.3	261.9
POS	147.0	3.5	17.5	9.4	30.9	176.1
EA	1,503.5	61.4	238.7	127.8	339.9	142.4
ENV	41.5	0.0	13.5	12.4	11.4	84.4
HC	105.7	0.0	22.9	13.1	29.0	126.7
HLT	145.1	5.5	39.9	30.8	36.3	90.9
RCR	122.5	8.7	47.0	38.3	30.3	64.4
EDU	397.9	32.6	197.6	204.2	99.7	50.4
SP	74.5	29.2	47.5	43.7	13.9	29.3
Total	2,061.2	511.1	832.6	793.3	337.4	40.5

Note: GPS: general public services, DEF: defense, POS: public order and safety, EA: economic affairs, ENV: environment, HC: housing and community, HLT: health, RCR: recreation, culture and religion, EDU: education, and SP: social protection.

Source: Authors' calculation, based on the data from the Report on revenues and expenditures, receipts and expenses (Form PR-RAS) for 2018.

Table 4

Expenditure for selected functions for counties in 2018 (as a % of total)

	General public services	Health	Primary education	Secondary education	Social protection
Share in total	26.1	4.1	8.0	8.5	6.1
Cumulative share	26.1	30.2	38.2	46.7	52.8

Source: Authors' calculation, based on the data from the Report on expenditure according to functional classification (Form RAS-functional) for 2018.

The share of expenditure for these functions in total functional expenditure of counties reaches almost 53%. Considering their relative importance, but also the fact that their cumulative share in total functional expenditure exceeds 50%, we focused on these five functions to analyze the presence of inequalities in service provision across counties. As a reminder, healthcare, primary and secondary education and social protection are among the newly decentralized functions (together with firefighting, which is in terms of decentralization more relevant for LGUs) that were predominantly assumed by counties. Inequalities measured with the Gini coefficients, but also other indicators, reveal significant disparities among counties in per capita expenditure for three out of five functions: healthcare, primary and secondary education (table 5).

Table 5

Summary statistics of per capita expenditure for selected functions of counties in 2018 (in HRK)

	General public services	Health	Primary education	Secondary education	Social protection
Max	353.7	145.1	143.9	220.5	74.5
Min	125.7	5.5	0.0	0.0	29.2
Average	207.9	39.9	49.5	71.8	47.5
Median	186.4	30.8	38.2	68.7	43.7
Standard deviation	65.6	36.3	45.2	69.2	13.9
Coefficient of variation (%)	31.6	90.9	91.2	96.3	29.3
Gini coefficient	0.168	0.431	0.497	0.521	0.158

Source: Authors' calculation, based on the data from the Report on expenditure according to functional classification (Form RAS-functional) for 2018.

LGUs (cities and municipalities), given their natural competences, provide a very different set of services. The most significant functions in terms of functional expenditure for cities and municipalities are: general public services, firefighting, road traffic, waste management, community development, street lights, healthcare, recreation and sport, culture, preschool education, primary education, secondary education and social protection. Expenditure for these functions in 2018 made up more than 73% of total functional expenditure for cities and more than 71% for municipalities (table 6).

Table 6

Expenditure for selected functions of LGUs in 2018 (as a % of total)

	Cities		Municipalities	
	Share in total	Cumulative share	Share in total	Cumulative share
General public services	23.6	23.6	25.1	25.1
Firefighting	1.5	25.1	2.7	27.9
Road traffic	6.9	31.9	9.2	37.1
Waste management	2.7	34.7	2.1	39.2
Community development	10.6	45.2	11.8	51.0
Street lights	2.3	47.6	3.7	54.6
Health	1.3	48.9	0.5	55.1
Recreation and sport	6.4	55.3	2.7	57.8
Culture	3.3	58.6	2.6	60.3
Preschool education	2.1	60.7	4.1	64.4
Primary education	4.9	65.6	1.4	65.9
Secondary education	2.1	67.7	0.4	66.2
Social protection	5.6	73.3	5.0	71.2

Source: Authors' calculation, based on the data from the Report on expenditure according to functional classification (Form RAS-functional) for 2018.

Table 7

Summary statistics of per capita expenditure for selected functions of cities in 2018 (in HRK)

	Max	Min	Average	Median	St. deviation	Coeff. of variation	Gini coefficient
GPS	10,370.13	186.41	1,082.54	863.68	1,000.31	0.92	0.32
FF	418.61	0.00	95.07	62.15	92.42	0.97	0.48
RT	2,393.84	0.00	401.28	322.04	454.64	1.13	0.56
WM	2,089.36	0.00	143.20	42.02	307.99	2.15	0.74
CD	4,480.03	0.00	519.55	234.97	693.88	1.34	0.63
SL	1,592.96	0.00	154.64	128.14	168.39	1.09	0.44
HLT	204.83	0.00	24.95	8.10	36.80	1.48	0.68
RS	1,353.31	0.00	236.25	162.10	242.09	1.02	0.45
CL	2,996.58	0.00	154.27	80.68	294.79	1.91	0.63
PREE	1,065.91	0.00	84.52	50.38	122.88	1.45	0.62
PRIE	3,059.82	0.00	109.67	32.60	321.14	2.93	0.77
SECE	506.40	0.00	11.96	0.00	47.76	3.99	0.85
SP	866.56	0.00	199.61	154.68	145.30	0.73	0.36

Note: GPS: general public services, FF: firefighting, RT: road traffic, WM: waste management, CD: community development, SL: street lights, HLT: health, RS: recreation and sport, CL: culture, PREE: preschool education, PRIE: primary education, SECE: secondary education, SP: social protection.

Source: Authors' calculation, based on the data from the Report on expenditure according to functional classification (Form RAS-functional) for 2018.

Gini coefficients of inequalities in service delivery measured as per capita expenditure for each of the functions selected in table 6 for cities are presented in table 7. Significant inequalities are present for all functions. The highest Gini coefficient is recorded for waste management (0.74), primary education (0.77) and secondary education (0.85). One main reason for such high values recorded for primary education is that some cities here have assumed the decentralized function of primary education and therefore have (*a priori*) higher expenditure but they also receive additional financing (PIT share and equalization grants for decentralized functions) for the assumed function. This is relevant also for firefighting services, although the Gini coefficient for firefighting is much lower than for primary education. In order to control for these effects, a separate analysis is later carried out for cities that took over the financing of primary education and firefighting as newly decentralized functions and those that did not.

Before that, we turn to an analysis of disparities in per capita expenditure for selected functions (according to table 6) for municipalities. The Gini coefficients presented in table 8 confirm significant inequalities in service delivery on a local level for municipalities as well. The most pronounced inequalities are observed in per capita expenditure for waste management (0.85) and secondary education (0.81), but very high Gini coefficients are recorded also for healthcare (0.77), culture (0.77) and community development (0.73).

Since 2001, some municipalities have taken the opportunity to assume the financing and provision of firefighting as a newly decentralized function. This is, in fact, the only newly decentralized function that some municipalities have assumed. In line with previous remarks made for cities, a separate analysis has to be conducted for those units that took over the decentralized functions and those that did not to isolate the impact of asymmetry in expenditure assignments. To cope with this problem, figure 7 presents Gini coefficients of per capita expenditure for primary education and firefighting for cities and municipalities, differentiating between these LGUs that took over the newly decentralized functions and those that did not. It turns out that inequalities are a bit lower for primary education for cities when decomposed into those that took over the decentralized functions and those that did not.[12] The analysis performed for the firefighting services shows similar results but only for cities that did not take over the decentralized functions and municipalities that did. For those two groups Gini coefficients are lower after the decomposition than before (when all the units are considered together).

[12] Note that even those LGUs that did not formally take over the decentralized functions (primary education and firefighting) still show expenditures according to the functional classification for these functions. These expenditures are much lower than for those LGUs that took over the decentralized functions and can include, for example, expenditure for voluntary fire brigades, student transportation, smart boards, computers, and other supplies.

Table 8

Summary statistics of per capita expenditure for selected functions of municipalities in 2018 (in HRK)

	Max	Min	Average	Median	St. dev.	Coeff. of variation	Gini coefficient
GPS	15,242.75	0.00	1,210.30	978.76	1,085.52	0.90	0.36
FF	2,038.27	0.00	124.80	91.22	143.52	1.15	0.47
RT	9,148.88	0.00	476.06	226.20	821.28	1.73	0.67
WM	2,013.74	0.00	89.65	5.07	248.62	2.77	0.85
CD	8,889.66	0.00	533.39	152.55	995.92	1.87	0.73
SL	3,061.17	0.00	174.92	107.95	240.40	1.37	0.57
HLT	408.36	0.00	16.21	0.00	35.00	2.16	0.77
RS	1,645.77	0.00	109.01	62.58	165.75	1.52	0.59
CL	5,968.96	0.00	124.16	36.00	439.87	3.54	0.77
PREE	3,199.89	0.00	172.37	81.84	264.46	1.53	0.64
PRIE	1,366.24	0.00	48.63	24.35	98.95	2.03	0.67
SECE	314.24	0.00	15.57	0.00	33.66	2.16	0.81
SP	10,840.23	0.00	226.21	126.43	563.77	2.49	0.54

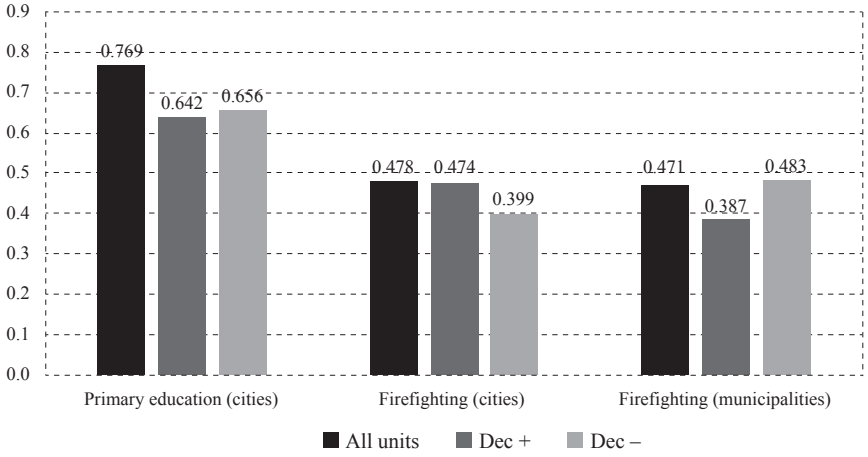
Note: GPS: general public services, FF: firefighting, RT: road traffic, WM: waste management, CD: community development, SL: street lights, HLT: health, RS: recreation and sport, CL: culture, PREE: preschool education, PRIE: primary education, SECE: secondary education, SP: social protection.

Source: Authors' calculation, based on the data from the Report on expenditure according to functional classification (Form RAS-functional) for 2018.

Although the analysis confirms the existence of significant inequalities in per capita expenditures for the provision of selected (among the most important) public services, these results have to be interpreted with caution for several reasons. First, functional expenditures observed here are normalized in per capita terms but some other measures might prove to be more relevant (e.g., per user or per unit of area, i.e., km^2). Furthermore, the expenditures analyzed include expenditures of LGUs (only) without the expenditures of their budgetary and extrabudgetary users. This means that total expenditure of all institutions involved in providing certain services are not presented here, but only the expenditure (transfer) from LGUs' budgets. Importantly, some services are also provided by utility companies (local SOEs). Their expenditures are also not included here as they do not appear in the budget. Such – more comprehensive – analysis should be done in future research, striving to include total consolidated (or, at least, aggregated) expenditures from all service providers. Moreover, only the most important (in terms of per capita expenditure) functions have been analyzed here. In the future, the analysis should be further expanded to all other functions. Lastly, given the specifics involved in the provision of each function, a separate analysis should be conducted for each function (or group of functions) with different indicators and criteria for evaluation tailored to each of those functions.

FIGURE 7

Gini coefficients of per capita expenditure for primary education and firefighting of cities and municipalities in 2018



Note: Dec +: LGUs that took over the decentralized functions, Dec –: LGUs that did not take over the decentralized functions.

Source: Authors' calculation, based on the data from the Report on expenditure according to functional classification (Form RAS-functional) for 2018.

5 EQUALIZATION GRANTS FOR DECENTRALIZED FUNCTIONS

No general expenditure needs equalization system exists in Croatia. Nevertheless, the government performs some sort of fiscal needs equalization, but only for the newly decentralized functions. In its decisions on minimum financial standards[13], the Government determines the minimum amount of funds to be provided to cover expenditure on the decentralized functions of primary and secondary education, social protection, health care and firefighting. If fewer funds than the amount implied by the minimum financial standards are received from the designated share of PIT for decentralized functions, LRGUs are entitled to equalization grants for their decentralized functions in the amount required to reach the minimum financial standards for every decentralized function assumed.

Although all LRGUs have the right to assume the financing of newly (optional) decentralized functions, practice reveals that the majority of these functions are taken over by counties and the City of Zagreb (table 9). They include secondary education, social protection – social welfare centers, homes for elderly and infirm and health care. Primary education has been decentralized also to 35 cities with the strongest fiscal capacities, whereas firefighting – public fire departments – has experienced widespread decentralization. Public fire departments are usually co-owned by LGUs (cities and municipalities) in different proportions and with different numbers of co-founders (e.g., the Zagorje public fire department is co-owned by 23 LGUs – 6 cities and 17 municipalities).

[13] See annex for a more detailed presentation of the criteria used for determining the minimum financial standards for each of the decentralized functions.

TABLE 9

Decentralization of particular public functions in 2020

Function	Decentralized to
Primary education	20 counties and the City of Zagreb, as well as 35 other cities with stronger fiscal capacities
Secondary education	20 counties and the City of Zagreb
Social care – social welfare centers	20 counties and the City of Zagreb
Homes for the elderly and infirm	17 counties and the City of Zagreb*
Health care	20 counties and the City of Zagreb
Firefighting – public fire departments	76 public fire departments co-owned by LGUs

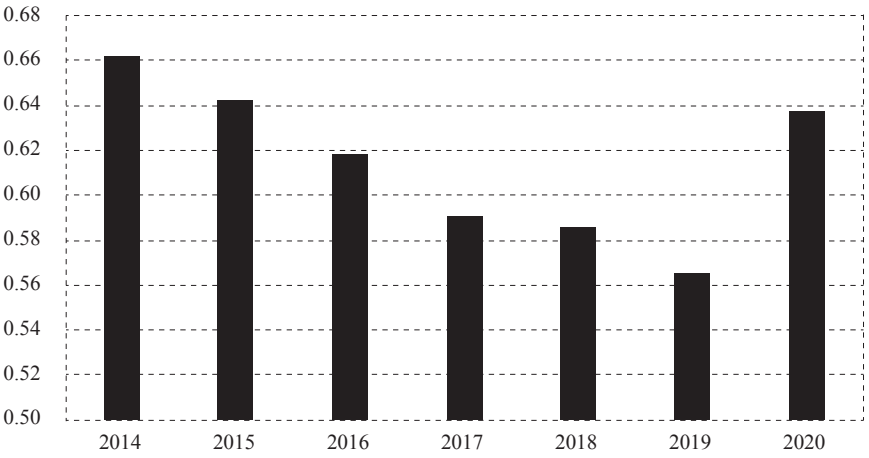
*Note: * In three counties (Virovitičko-podravska, Zagrebačka and Krapinsko-zagorska) there are no homes for the elderly and infirm founded by the state nor the LRGUs.*

Source: Decisions on minimum financial standards for individual public functions (OG 128/19).

The Government determines the manner of the financing of decentralized functions and the method of calculating the amount of equalization grants for decentralized functions for each year by the decree. Equalization grants for decentralized functions are provided in the central government budget to the accounts of ministries responsible for primary and secondary education, social welfare, health and firefighting. The overall amount of the planned pooled funds for all decentralized functions from 2014 to 2020 is shown in figure 8.

FIGURE 8

Expected expenditure for decentralized functions from 2014 to 2022 (in % of GDP)



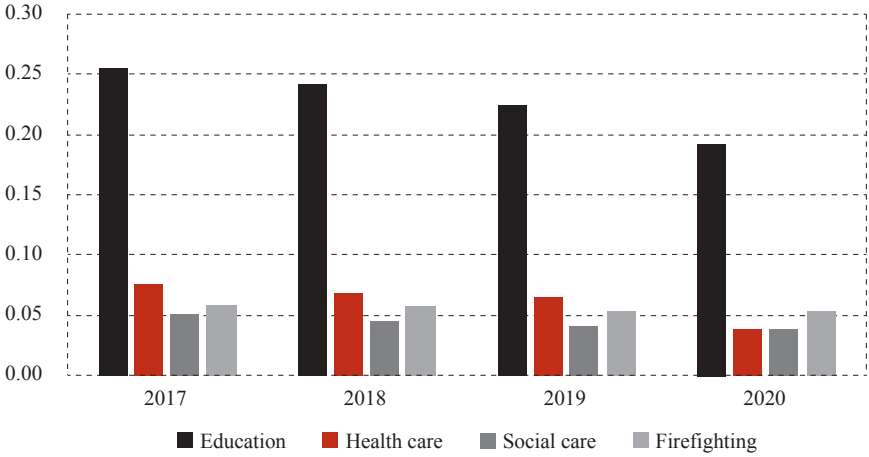
Source: Annual regulations on the financing of decentralized functions and the calculation of the amount of equalization grants for decentralized functions of LRGUs from 2014 to 2020.

The difference between the minimum financial standards (expected expenditure for decentralized functions) and the amount collected through the designated PIT share for each function is covered from the equalization grants for decentralized functions. The total value of equalization grants for decentralized functions has decreased

over time from 0.44% of GDP in 2017 to 0.32% of GDP in 2020 (figure 9). The majority of equalization grants for decentralized functions are devoted to education (almost 60% of total in 2020), whereas the shares for other decentralized functions are more or less equal and amount to slightly above 0.1% of GDP in total.

Figure 9

Equalization grants for decentralized functions from 2017 to 2020 (in % of GDP)



Source: Ministry of Finance – Analytical report of the Budget from 2017 to 2020.

In practice there is an asymmetry on how the two sources of financing (PIT shares and specialized equalization grants) actually work. Any "excess" PIT shares are kept. That is, if LRGUs financing the decentralized functions generate more revenue from the PIT share for decentralized functions than the minimum financial standards set, they can use the excess funds to finance decentralized functions taken over in the amount above the minimum financial standards. However, any "excess" specialized equalization grant has to be returned. That is, if LRGUs financing the decentralized functions receive equalization grants for decentralized functions in excess of the amount established by the minimum financial standards, they have to pay the excess funds back to the state budget within the deadline set by the Government. This surplus of funds is the revenue of the state budget.

Similar to the evaluation of the fiscal capacity equalization, the effectiveness of equalization grants for decentralized functions can be assessed by calculating the Gini coefficient of per capita funds collected through the designated share of the PIT for each function and the coefficient after disbursement of the equalization grants for decentralized functions. The Gini coefficients for 2018 are presented in table 10.

Table 10

Effectiveness of the fiscal needs equalization system for newly decentralized functions in 2018

Decentralized function	Tier of government	Gini coefficient	
		Before equalization	After equalization
Firefighting	Local	0.284	0.454
Primary education	Local	0.186	0.185
Primary education	Regional	0.329	0.148
Secondary education	Regional	0.230	0.097
Social welfare centers	Regional	0.233	0.202
Nursing homes	Regional	0.219	0.262
Health care	Regional	0.230	0.184

Source: Authors based on the MoF data.

The results show that equalization grants for decentralized functions significantly reduce disparities in the provision of primary and secondary education on the regional level. Inequalities are also somewhat reduced in the provision of health care and social welfare centers at the regional and very marginally for primary education at the local level. However, this instrument turns out to increase inequalities when it comes to firefighting at the local level and nursing homes at the regional level. Nevertheless, again, these results have to be interpreted with caution because inequalities are shown in per capita terms, whereas a more appropriate normalization method would be per user, so further research should also analyze that perspective.

In any case, deeper analysis of the amount of equalization grants for decentralized functions, as well as a comparison of this sum with the minimum financial standard and the amount collected through the PIT share for each function (table 11), also reveals other important findings. The total amount of equalization grants for decentralized functions in 2018 appeared to be more than 2 times higher than the amount collected through the PIT share for decentralized functions. This pattern is also pronounced at the level of individual functions. LRGUs collect from 24.5% (for primary education at the regional level) to 46.1% (for primary education at the local level) of the total required revenue (minimum financial standard) through the PIT share for particular functions, whereas the rest comes from the equalization grants for decentralized functions.

This additionally confirms the need to revise the system as it seems that LRGUs are not only faced with the issue of horizontal fiscal inequalities but also vertical fiscal imbalances when it comes to newly decentralized functions. To this end, the government might also consider increasing the PIT shares for decentralized functions as the incentive for assuming the newly decentralized functions appears to be asymmetrical, i.e., the transfer (or decentralization) of expenditure responsibilities is more intense than of the revenue sources.

Table 11

Minimum financial standards and equalization grants for newly decentralized functions in 2018 (in HRK million)

Decentralized function	Tier of government	Minimum standard	Collected from the PIT	Equalization grant for dec. functions
Firefighting	Local	314.9	97.2	223.8
Primary education	Local	353.3	162.8	190.5
Primary education	Regional	649.8	158.9	491.0
Secondary education	Regional	438.1	161.4	276.6
Social welfare centers	Regional	96.1	30.4	65.8
Nursing homes	Regional	164.5	67.1	111.3
Health care	Regional	387.9	125.7	267.0
Total		2,404.6	803.5	1,626.0

Source: Authors.

It is worth repeating here that this analysis should be expanded also to other – and not only the newly decentralized – functions. However, it provides enough evidence for a serious consideration of the inclusion of fiscal needs in the general fiscal equalization formula. The most commonly accepted objective of fiscal equalization is to allow subnational governments to provide to their residents similar levels of access to a standard package of public services when they exercise average levels of tax effort. Our results show that with the (currently partial) equalization of fiscal capacities, this objective might not be achieved, as LRGUs differ in their expenditure needs, in consequence of their different demographic compositions, socioeconomic conditions, or costs of services delivery. International experience provides many different examples of fiscal equalization design where both fiscal capacity and expenditure needs are taken into account.

The state of the art in the design of equalization transfers in the international practice is the "fiscal gap" approach, defined as the difference between estimated expenditure needs and fiscal capacities. An increasing number of countries have adopted this methodology. Among developed OECD countries: Australia, Canada for the Northern Territories, Italy, Japan, Korea, Sweden, United Kingdom, and many U.S. states; among countries in transition: China, Latvia, Russia, Ukraine and Vietnam; and among developing countries: Indonesia, Peru, and Uganda. Closely related, Canada implements equalization for its provinces (as opposed to the territories) only on the basis of fiscal capacity per capita. Germany, Poland and Spain use yet another variation of the methodology by equalizing fiscal capacity per adjusted population (instead of simply per capita), where adjustments to the actual population are made to reflect differences in expenditure needs (Martinez-Vazquez, 2020).

6 CONCLUSIONS (POLICY RECOMMENDATIONS AND OPTIONS FOR REFORM)

There have been advances in subnational fiscal equalization in Croatia but these reforms need to go further. Although a solid system for mitigating disparities among LRGUs' fiscal capacity was finally introduced in 2018, further steps towards greater fiscal equalization should be taken, in particular by incorporating the (potential) existing disparities in expenditure needs into the equalization system, as well as by accounting fully for disparities in fiscal capacity (by incorporating measures for potential revenues from all own sources).

In terms of expenditure needs, one approach would be for the central government to determine what public services should be provided by all local and regional units and at what level (quantity and quality), so that the equalization system can guarantee access to an equal or similar level for those services to all citizens regardless of where they live in the country. A second approach would be to determine the minimum financial standards per client for all the services in the list. This second approach is more practical and it has the precedence of the methodology currently being used for the newly decentralized functions. The difficulty may lie in selecting the proper client base and also the financial standard. But for the latter it would be possible for example to start with actual historical spending per capita. Currently, a comparison of the service provision for many of those functions reveals that there are significant disparities or unevenness among municipalities, cities and counties. Moving forward, it would be necessary to determine the affordable (in budgetary terms) minimum standards of public services to which all citizens are entitled, at least in the forms of minimum financial norms per client (main service users), so that there are no large disparities or more generally unequal coverage or access to public services in different LRGUs, with different staffing and financial opportunities.

Currently, despite the equalization in fiscal capacity, there is still a big difference in the provision of public services, pointing to the need for the introduction of expenditure fiscal needs in the equalization system side by side with fiscal capacity equalization and also the need to account fully for disparities in fiscal capacity by incorporating measures for total potential own revenues. This will not be an easy task. The minimum financial standards should be affordable within existing overall budget constraints; that is, they should correspond to the fiscal reality of the country, and only revised over time as the overall financing and budget constraints allow it. However, there is a wealth of methodologies and experiences at the international level to quantify expenditure needs, from which Croatian authorities could draw to implement these reforms. There is also a variety of methodologies that can be used to measure potential own revenues.

The fiscal equalization system is currently faced with a lack of clarity in the design and effects of a fiscal needs equalization/distribution formula (calculating minimum financial standards, etc.). A sequenced reform should be put in place in order

for the system to evolve and mature in line with EU/OECD country experiences. The initial phase could include studying the reform of the equalization grants to include expenditure needs equalization by means of either adopting the fiscal gap approach to equalization or the fiscal capacity per adjusted population approach (where the adjusted population reflects differences in expenditure needs). The inclusion of the expenditure needs and the full measure of fiscal capacity of LRGUs would bring the current equalization system closer to the best international practices and ensure more equitable outcomes in terms of access to basic public services by Croatian citizens.

Disclosure statement

No potential conflict of interest was reported by the authors.

REFERENCES

1. Bajo, A. and Bronić, M., 2007. Procjene učinkovitosti modela fiskalnog izravnanja u Hrvatskoj. *Financijska teorija i praksa*, 31(1), pp. 1-24.
2. Bird, R. M. and Tarasov, A. V., 2002. Closing the Gap: Fiscal Imbalances and Intergovernmental Transfers in Developed Federations. *Andrew Young School of Policy Studies Working Paper,* No. 02-02.
3. Blöchliger, H., 2014. *Fiscal equalisation – a cross-country perspective*. Paper prepared for the conference on "Fiscal Equalisation", Berlin, 26-27 June 2014.
4. Boadway, R., 2004. The Theory and Practice of Equalization. *CESifo Economic Studies*, 50 (1), pp. 211-254. https://doi.org/10.1093/cesifo/50.1.211
5. Boadway, R., 2007. *Grants in a Federal Economy: A Conceptual Perspective*. In: R. Boadway and A. Shah. *Intergovernmental Fiscal Transfers: Principles and Practice*. Washington, D.C.: The World Bank.
6. Bronić, M., 2008. *Utjecaj fiskalnih kapaciteta i potreba na fiskalne nejednakosti hrvatskih županija*. Doctoral thesis. Faculty of Economics, University of Zagreb.
7. Bronić, M., 2010. Evaluating the Current Equalization Grant to Counties in Croatia. *Financial Theory and Practice*, 34(1), pp. 25-52.
8. Bronić, M., 2020. Economic and Financial Crisis and Local Government Units' Budgets in Croatia. *9th International Scientific Symposium Region, Entrepreneurship, Development*, pp. 116-130.
9. Buchanan, J. M. and Wagner, R., 1970. An efficiency basis for federal fiscal equalization. In: J. Margolis, ed. *Analysis of Public Output*. New York: Columbia University Press, pp. 139-158.
10. Cowell, F. A., 2009. *Measuring Inequality*. London School of Economics and Political Sciences, Distributional Analysis Research Programme.
11. Dafflon, B., 2007. Fiscal Capacity Equalisation in Horizontal Fiscal Equalisation Programs. In: R. Boadway and A. Shah. *Intergovernmental Fiscal Transfers: Principles and Practice*. Washington, D.C.: The World Bank, pp. 361-397.
12. Gini, C., 1912. *Variabilità e mutabilità: Contributo allo studio delle distribuzioni e relazioni statistiche*. Bologna: Tipogr. di P. Cuppini.
13. Gini, C., 1921. Measurement of Inequality of Incomes. *The Economic Journal*, 31(121), pp. 124-126. https://doi.org/10.2307/2223319
14. Hierro, L. A., Atienza P. and Patiño, D., 2007. Inequality and Progressiveness in the Distribution of Revenues of the States in Federal Countries: A Comparative Study. *Andrew Young School of Policy Studies Working Paper,* 07-03.
15. Hodžić, S. and Muharemović, A., 2019. Fiscal Decentralization and Efficiency of Regional Government in Croatia: A Data Envelopment Analysis. *Lex localis,* 17(3), pp. 453-470. https://doi.org/10.4335/17.3.453-470(2019)
16. Hodžić, S. and Paleka, H., 2020. Fiscal Capacities of Large Cities in Croatia – Financial Support for Smart Cities. *Naše gospodarstvo*, 66(2), pp 42-49. https://doi.org/10.2478/ngoe-2020-0010

17. Jurlina Alibegović, D., Hodžić, S. and Bečić, E., 2019. The level of fiscal autonomy: evidence from Croatia, Serbia and Bosnia and Herzegovina. *The NISPAcee Journal of Public Administration and Policy,* 12(1), pp. 91-112. https://doi.org/10.2478/nispa-2019-0004
18. Jurlina Alibegović, D., Slijepčević, S. and Kordej-De Villa, Ž., 2013. Can Local Governments in Croatia Cope with more Responsibilities? *Lex localis*, 11(3), pp. 471-495. https://doi.org/10.4335/11.3.471-495(2013)
19. Lago Manuel, E., Lago-Peñas, S. and Martinez-Vazquez, J., 2002. On the effects of intergovernmental grants: A survey. *International Center for Public Policy (ICePP) Working Paper,* No. 2202.
20. Lorenz, M. O., 1905. Methods of Measuring the Concentration of Wealth. *Publications of the American Statistical Association,* 9(70), pp. 209-219. https://doi.org/10.2307/2276207
21. Martinez-Vazquez, J. and Timofeev, A., 2008. Regional – local dimension of Russia's fiscal equalisation. *Journal of Comparative Economics*, 36, pp. 157-176. https://doi.org/10.1016/j.jce.2007.04.004
22. Martinez-Vazquez, J., 2020. Emerging trends in fiscal transfer systems in selected federations: implications for India. In: S. Yilmaz and F. Zahir, eds. *Intergovernmental Transfers in Federations*. Cheltenham; Northampton: Edward Elgar Publishing. https://doi.org/10.4337/9781789900859.00023
23. Portnov, B. A. and Felsenstein, D., 2010. On the suitability of income inequality measures for regional analysis: Some evidence from simulation analysis and bootstrapping test. *Socio-Economic Planning Sciences*, 44, pp. 212-219. https://doi.org/10.1016/j.seps.2010.04.002
24. Primorac, M., 2014. The Restructuring of the Fiscal Equalization System in Croatia. *Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu*, 32(2), pp. 213-232.
25. Primorac, M., 2015. The effectiveness of fiscal equalisation in Croatia. Economic Research - Ekonomska Istraživanja, 28(1), 299-311. https://doi.org/10.1080/1331677X.2015.1043780
26. Rao, M. G., 2007. Resolving Fiscal Imbalances: Issues in Tax Sharing. In: R. Boadway and A. Shah. *Intergovernmental Fiscal Transfers: Principles and Practice*. Washington, D.C.: The World Bank, pp. 319-338.
27. Shah, A., 2007. A Practitioner's Guide to international Fiscal Transfers. In: R. Boadway and A. Shah. *Intergovernmental Fiscal Transfers: Principles and Practice*. Washington, D.C.: The World Bank, pp. 1-53.
28. Shankar, R. and Shah, A., 2003. Bridging of Economic Divide within Countries: A Scorecard on the Performance of Regional Policies in Reducing Regional Income Disparities. *World Development*, 31(8), pp. 1421-1441. https://doi.org/10.1016/S0305-750X(03)00098-6
29. Škarica, M., 2021. Process of local government fragmentation in Croatia: From a big-bang to a status quo. *Miscellanea Geographica – Regional studies on development*, 25(1), pp. 46-53. https://doi.org/10.2478/mgrsd-2020-0043

30. Slack, E., 2007. Grants to Large Cities and Metropolitan Areas. In: R. Boadway and A. Shah. *Intergovernmental Fiscal Transfers: Principles and Practice*. Washington, D.C.: The World Bank, pp. 453-481.
31. Spahn, P. B, 2007. Equity and Efficiency Aspects of Interagency Transfers in a Multi-government Framework. In: R. Boadway and A. Shah. *Intergovernmental Fiscal Transfers: Principles and Practice*. Washington, D.C.: The World Bank, pp. 75-106.
32. Spiezia, V., 2003. Measuring regional economies. *Statistics Brief*, No. 6.
33. UN-Habitat, 2012. *Fiscal Decentralization in Japan*. Nairobi: The Global Urban Economic Dialogue Series, United Nations Human Settlements Programme.
34. Vigneault, M., 2007. Grants and Soft Budget Constraints. In: R. Boadway and A. Shah. *Intergovernmental Fiscal Transfers: Principles and Practice*. Washington, D.C.: The World Bank, pp. 133-171.
35. World Bank, 2021. *Fiscal Decentralization in Croatia*. Washington: The World Bank Group.

ANNEX

CRITERIA FOR DETERMINING THE MINIMUM FINANCIAL STANDARDS FOR DECENTRALIZED FUNCTIONS

The criteria for determining the minimum financial standards for decentralized functions are determined each year by the Government's decision for each function. Below, we provide the extracts from decisions setting the criteria for decentrlaized functions for 2020.

FIREFIGHTING

LGUs that are the founders and co-founders of public fire departments provide funding for employees and for material and financial expenditures. According to the Decision on Minimum Financial Standards for Performing the Activities of Public Fire Brigades in 2020 (OG 128/2019), the minimum financial standard for 2020 is set at a total of HRK 341,484,990. The criteria and benchmarks for setting minimum financial standards as a basis for planning grants for the decentralized function of firefighting to the founders and co-founders of public fire brigades in 2020 are:

- fixed assets – fixed allowance (20 percent of the total amount);
- classification of the unit according to vulnerability, capability, and resilience (20 percent);
- number of inhabitants in the area of the founder and co-founder that the fire brigade can reach in 15 minutes (25 percent);
- the area of the founder and co-founder that the fire brigade can reach in 15 minutes (5 percent);
- current average of financing from 2003 to 2019 (25 percent);
- other risks, additional activities on command, and correction for personal protective equipment (5 percent).

HEALTH CARE

The Decision on Minimum Financial Standards for Decentralized Functions for Health Care Institutions in 2020 (OG 128/2019) sets minimum financial standards for:

- investment of health care institutions in premises, medical and non-medical equipment, and means of transport;
- investment and current maintenance of health care institutions: premises, medical and non-medical equipment, and means of transport;
- informatization of health care.

The minimum financial standard for 2020 is set at a total of HRK 407,549,130. The amount of funds allocated to an individual county, plus the City of Zagreb, is determined by applying the following criteria:

- the share of the number of insured persons in each county, plus the City of Zagreb, in relation to the total number of insured persons with the Croatian Health Insurance Institute (75 percent of the total amount);
- the share of the number of locations where health care activities take place in each county (and Zagreb) in relation to the total number of locations in Croatia (10 percent);

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

– the share of the number of health care institutions in each county (and Zagreb) in relation to the total number of health care institutions that have a contract with the Croatian Health Insurance Institute (5 percent);
– the share of the number of contracted beds in each county (and Zagreb) in relation to the total number of contracted beds with the Croatian Health Insurance Institute in Croatia (5 percent);
– corrective criterion: the inclusion of projects of priority importance to raising the availability of health care or completing the started investments, taking into account the share of investments in the health care institutions (premises, medical and non-medical equipment, and means of transport) of counties from the state budget in previous years (5 percent).

PRIMARY EDUCATION

The Decision on the Criteria for Determining Balance Sheet Rights[14] for Financing the Minimum Financial Standard for Public Needs of Primary Education in 2020 (OG 128/2019) determines total balance sheet rights of LRGUs for:

– material and financial expenditures;
– expenses for materials and parts for current and investment maintenance, current and investment maintenance services;
– expenditures for the acquisition of produced fixed assets and additional investments in non-financial assets.

The amount of funds allocated to an individual county, plus the City of Zagreb, is determined by applying the following criteria:

– For material and financial expenditures: the amount of these expenditures determined in 2019 (OG 2/2019), in accordance with the Economic and Fiscal Policy Guidelines for the period 2020-22 and the Budget Guidelines for LRGUs for the period 2020-22.
– For expenditures for current and investment maintenance: the number of students, classrooms, and school buildings in the school year 2019/20, based on average calculation prices as follows: per student HRK 62.00 per year, per class department HRK 1,032.77 per year, and per school building HRK 7,564.08 per year.
– For expenditures for the acquisition of produced fixed assets and additional investments in non-financial assets: the number of students, classrooms, and school buildings in the school year 2019/20, based on average calculation prices as follows: per student HRK 189.65 per year, per class department HRK 3,158.95 per year, and per school building HRK 4,990.19 per year.

[14] Balance sheet rights are the funds required to ensure minimum financial standards for a particular decentralized function according to decisions on minimum financial standards.

SECONDARY EDUCATION

The Decision on Criteria for Determining Balance Sheet Rights for Financing the Minimum Financial Standard of Public Needs of Secondary Schools and Student Dormitories in 2020 (OG 128/2019) determines total balance sheet rights for counties and the City of Zagreb for:

- material and financial expenditures;
- expenditures for materials and parts for current and investment maintenance and current and investment maintenance services;
- expenditures for the acquisition of produced fixed assets and additional investments in non-financial assets.

The amount of funds allocated to an individual county, plus the City of Zagreb, is determined by applying the following criteria:

- For material and financial expenditures: amount of these expenditures determined in 2019 (OG 2/2019), in accordance with the Economic and Fiscal Policy Guidelines for the period 2020-22 and the Budget Guidelines for LRGUs for the period 2020-22.
- For expenditures for current and investment maintenance: the number of students, classrooms and school buildings in the school year 2019/20, based on average calculation prices as follows: per student HRK 64.74 per year, per class department HRK 1,246.62 per year and per school building HRK 11,553.76 per year for secondary schools and HRK 492.23 per year per student for dormitories.
- For expenditures for the acquisition of produced fixed assets and additional investments in non-financial assets: the number of students, classrooms and school buildings in the school year 2019/20, based on average calculation prices as follows: per student HRK 177.91 per year, per class department HRK 3,425.65 per year and per school building HRK 6,847.83 per year.

The criterion for determining the balance sheet rights for co-financing in student dormitories in counties and the City of Zagreb is the number of students enrolled in the school year 2019/20. The measure is the average price of HRK 6,300 per student for I-IV class.

SOCIAL CARE – SOCIAL WELFARE CENTERS

The Decision on Minimum Financial Standards and Criteria for Financing Material and Financial Expenditures of Social Welfare Centers and Firewood Costs for Users Heating with Wood in 2020 (OG 128/2019) sets minimum financial standards for counties and the City of Zagreb for material and financial expenditures of social welfare centers headquartered in their area. The criterion for material and financial expenditures is the number of employees in the social welfare center. The measure is the average monthly amount of funds per worker. Counties and the City of Zagreb provide funds for firewood costs to users heating with wood. The criterion for the expenditure of heating costs is the number of users planned in 2019. The measure is the amount of HRK 1,050 per user.

PUBLIC SECTOR ECONOMICS
46 (4) 533-567 (2022)

HOMES FOR THE ELDERLY AND INFIRM (NURSING HOMES)

The Decision on Minimum Financial Standards and Criteria for Decentralized Financing of Homes for the Elderly and the Infirm in 2020 (OG 128/2019) sets minimum financial standards for counties and the City of Zagreb for expenditures for employees, material and financial expenditures, and expenditures for the acquisition of non-financial assets and emergency interventions.

Criteria for financing expenditures for employees are determined by the number of employees, that is, per beneficiary (of permanent accommodation, adjusted coefficient of 20 percent for beneficiaries of home help and delivery and preparation of meals for external beneficiaries), according to:

- a regulation determining the minimum conditions for the provision of social services;
- the law that regulates salaries in public services and, according to the regulation, that determines job titles and coefficients of complexity of jobs in public services;
- the basis for calculating the salary of employees in public services determined by a collective agreement or a decision of the Government of the Republic of Croatia;
- the provisions of the Basic Collective Agreement for Civil Servants and Employees in Public Services and the Collective Agreement for Social Welfare Activities, which apply as legal rules.

The measure for settling material and financial expenditures is the number of beneficiaries.

Criteria for financing the expenditure of non-financial assets are determined per beneficiary according to:

- a regulation laying down minimum conditions for the provision of social services;
- the condition of the space and equipment according to the intensity of investment in previous years and investment per beneficiary.

The counties and the City of Zagreb secure, per home for the elderly and infirm, HRK 150,000 per year for emergency interventions (investment maintenance, equipment and procurement of non-financial assets).

Sustainability aspects of participatory budgeting at the municipal level in Slovenia

NEJC BREZOVAR, Ph.D.*
TATJANA STANIMIROVIĆ, Ph.D.*

Article**
JEL: H72
https://doi.org/10.3326/pse.46.4.6

* The authors would like to thank the two anonymous reviewers for their very useful comments and suggestions.
** Received: April 2, 2022
Accepted: August 30, 2022

Nejc BREZOVAR
University of Ljubljana, Faculty of Public Administration, Gosarjeva ulica 5, 1000 Ljubljana, Slovenia
e-mail: nejc.brezovar@fu.uni-lj.si
ORCiD: 0000-0002-9093-977X

Tatjana STANIMIROVIĆ
University of Ljubljana, Faculty of Public Administration, Gosarjeva ulica 5, 1000 Ljubljana, Slovenia
e-mail: tatjana.stanimirovic@fu.uni-lj.si
ORCiD: 0000-0003-4528-8725

PUBLIC SECTOR ECONOMICS
46 (4) 569–589 (2022)

Abstract

The Local Self-Government Act has given explicit legal ground for the use of optional participatory budgeting (PB) on the municipal level in Slovenia since 2018. This means municipalities and their inhabitants have absolute discretion regarding the nature of proposed and later (if chosen) implemented projects in a certain municipality if the projects fall under municipal authority. The article presents research results that reveal that a legislative soft approach to PB, resulted in small municipal engagement in PB projects. They on average spent up to one percent of budgetary expenses for PB purposes, resulting mostly in inclusive, people-centered projects promoting facilities for socializing, and different kinds of public infrastructure capacities (sports infrastructure, etc.). The projects implemented in Slovenia so far are prevailingly "public infrastructure projects" in line with the municipal social sustainability agenda promoting equality and diversity, social cohesion, democracy and governance, and quality of life in a certain municipality.

Keywords: participatory budget, municipalities, regulation, social sustainability, Slovenia

1 INTRODUCTION

In the last few decades, the participatory budgeting concept has been developed and has spread worldwide as part of a larger field of interest in democratic innovations. These innovations emerged in several different forms, from consensus conferences, deliberative polls, and citizen juries to ideas of empowered participatory governance, countervailing power, participatory publics, fourth power, etc. (Sintomer, Herzberg and Röcke, 2008).

The idea of PB was first introduced in Porto Alegre (Brasil) in 1989 and has spread from Latin America to other parts of the world, especially Europe. Worldwide it has been introduced in several different forms. Consequently, it would be unfounded to give a hard-and-fast definition of the term participatory budgeting, since the sociological essence of a procedure can hardly be unambiguously demarcated, and differences between Latin America and Europe are enormous (Cabanes, 2004; Sintomer, Herzberg and Röcke, 2008). Nevertheless, PB generally refers to an inclusive, deliberative process of incorporating citizen priorities into local government decision-making on public investment (Bland, 2017). Participatory budgeting has been classified as one of the collaborative innovation models contributing to sustainable development, especially in urban areas. Lately, some positive examples can also be found in rural areas (Bednarska-Olejniczak, Olejniczak and Svobodová, 2020). Although the previous studies are not consistent in their separate definitions and dimensions of the term sustainability, it encompasses environmental protection, economic performance, and societal welfare simultaneously (Glavič and Lukman, 2007).

The United Nations Brundtland Commission originally defined sustainability in its Report of the World Commission on Environment and Development: Our

PUBLIC SECTOR ECONOMICS
46 (4) 569-589 (2022)

Common Future (1987) as "Meeting the needs of the present without compromising the ability of future generations to meet their own needs." In the report (chapter 1, p. 43), they called for new approaches that must involve programs of "social development, particularly to improve the position of women in society, to protect vulnerable groups, and to promote local participation in decision making."

Participatory budgeting practices and projects can therefore be used as a tool promoting different types of sustainability. For the purpose of this paper, we shall try to determine which of the three types of sustainability (social, environmental, and economic) is most supported by municipal PB projects and at the same time take a glance at the organizational aspects of PB sustainability that can lead to such results.

Our research accordingly focuses on two main research questions connected to different aspects of sustainability regarding PB practices and projects:

1) What kind of practices have developed among Slovenian municipalities regarding the organizational aspect (mechanisms for proposal, voting practice, etc.) of PB after the legalization of the PB concept?
2) What is the prevailing nature of implemented PB projects and consequently which of the three types of sustainability (social, economic, and environmental) is predominately promoted?

Since PB presents a new method of citizen engagement in Slovenia our motivation was to determine the organizational and other prevailing sustainability aspects connected to various PB practices in Slovenian municipalities. This will be achieved by presenting the effects state-imposed PB legal grounds have on the practical (organizational) implementation of PB practices when we are dealing with a soft legal approach. Special emphasis will be given to presenting where such an approach leads, regarding the nature of adopted PB projects and the type of sustainability they predominately promote. Such a combined approach to analyzing the nature of PB projects and their connection to a certain type of sustainability in Slovenian municipalities brings new insight into academic assessments of PB.

2 LITERATURE REVIEW OF THE DEVELOPMENT OF THE PARTICIPATORY BUDGETING AND SUSTAINABILITY CONCEPTS

The idea of sustainability has been promoted for more than 30 years (Brundtland report) by the UN, although the idea itself has been criticized for its vagueness and lack of clarity. The 2030 Agenda for Sustainable Development (UN, 2015) has confirmed global commitment to the general sustainability concept, which has been upgraded with the Framework for Strategic Sustainable Development (FSSD) (Broman and Robèrt, 2017) to create a unified structure for strategic sustainability actions. The main idea behind this is to develop a vision framed by principles for social and ecological sustainability, focusing mainly on a broad, systematic perspective of sustainability challenges. Since the socio-ecological system is complex and adaptive, and sustainability issues are interlinked, the results are hard to predict, and consequently, the systems should be considered

holistically (Leminen et al., 2021). In this context, the concept of social sustainability has developed as a result of the discontent with the dehumanized prioritization between people and the environment in previous models of sustainability (Littig and Grießler, 2005). Organizational sustainability on the other hand is mostly seen and researched into in connection with corporate and business organizations while some of its components include social justice and inclusion (Vargas-Hernández, 2021). Since municipalities themselves are in general seen as systems of local government organizations, the organizational sustainability of a municipality regarding PB practices will be understood as a means of promoting the goal of implementing functioning and repeatable PB practices and projects at the municipal level.

Societies are still searching for solutions for sustainable development, although it is clear that good governance is a critical tool and element to be incorporated into sustainable development strategies. It should contribute to long-term and strategic objectives, to the coherence of policy with horizontal and vertical coordination, and to open and transparent practices of involving stakeholders, especially in local communities (Umar et al., 2018). This public participation can support and improve public governance, by providing more effective and representative outputs, called also public goods (Stortone, 2010; Kardos, 2012).

Participatory budgeting has been introduced in various forms in the last three decades in different parts of the world, the authors have taken the definition that fits the Slovenian model most. PB is a form of optional direct budgetary democracy, which offers citizens above all the opportunity to learn about the work of the local executive bodies, participate in consultations and discussions, and affect the use of public funds. It is also a tool for learning, collaboration, training citizens, and strengthening the requirements of good governance. Increasing transparency and accountability, provided by the use of PB, can also reduce managerial inefficiencies, and limit clientelism, patronage, and corruption (Sgueo, 2016).

An important part of the literature used PB to explore democratic theory, focusing on themes of participation, deliberation, accountability, social capital, and civic engagement (McCarthy, 2021). On the other hand, several studies (Spada, 2014; Kim, 2016) have been analyzing PB diffusion processes. The literature review has revealed that the studies considering cases from the Latin America and Europe are much more numerous, while other regions are less represented. For instance, in the last couple of years, PB has appeared also in Central and Eastern European countries (CEE). There are several papers witnessing the experiences of CEE countries, but also other European countries (Milosavljević et al., 2020; Boc, 2019; Oross and Kiss, 2021), among which the book *International Trends in Participatory Budgeting* (De Vries, Nemac and Špaček, 2022) predominates in several of the countries covered. The book reveals that the critical drivers of the development of PB differ among countries, although NGOs and other civic initiatives are major accelerators of the PB trend. The promotors of civil society

PUBLIC SECTOR ECONOMICS
46 (4) 569-589 (2022)

promote the idea to politicians, who probably only use the idea for their political marketing. Except for Slovenia and Poland, none of the research countries (Belarus, Croatia, Czech Republic, Hungary, Romania, Russia, Serbia, Slovakia) have enacted PB in law, while all are having some similar implementation problems; starting with problems of project submission, the organization of voting, the efficiency of the process and decisions about eligibility to vote.

In this wide range of relatively new literature, the lack of PB interconnection is evident. Features like multidimensionality, guidance to policy-making, sharing, objectivity, relevance, and, from our perspective the very important participation, have been revealed to be important. It has turned out that the choice of indicators must be the outcome of a bottom-up process that produces the measurement tool and valid evaluations that all the stakeholders understand and accept (Scipioni et al., 2009). Such indicators could be of some use when concretizing the sustainability concept at the level of municipalities. The research results have revealed that the decisions made by local governments are mostly intended to increase financial and social sustainability. It turned out that such progress generates a high level of satisfaction and collaboration and restores "citizens' trust in government". However, municipal authorities must be aware that financial and social sustainability could be conflicted under certain conditions, since high-quality levels of social services and/or high investments in social infrastructure may adversely affect financial sustainability (Caldas, Dollery and Marques, 2020). What happens in cases where local authorities decide to give the power, to decide on the nature of implemented local projects – which are in a way aimed at promoting a certain type of sustainability – to "the people"? Do they predominately promote social, ecological or financial sustainability aspects and projects? Our paper tries to address such and similar issues regarding PB practices in Slovenia.

3 LEGAL FRAMEWORK FOR AND DEVELOPMENT AND EFFECTS OF PARTICIPATORY BUDGETING IN SLOVENIAN MUNICIPALITIES: ORGANIZATIONAL ASPECT

Slovenia is a small country with two million inhabitants and one-level local self-government with two hundred and twelve municipalities. The use of PB in Slovenia has not been prohibited by national legislation, yet it was not used until a few years ago. In 2015 a pilot project was tested in one urban municipality. Later, in May 2018, the Local Self-Government Act (LSGA), which regulated (among other issues) the concept of PB, was adopted. A new Article 48a was added saying that, "in the process of preparing the draft budget, the municipality may determine the amount of funds intended for funding of projects proposed by citizens. The municipality carries out citizen consultation regarding proposed projects consultations, no later than the submission of the budget to the municipal council for adoption". The proposition of the LSGA explicitly stated that one of the main purposes of the proposed solutions of the new legislature was "regulation of participatory budgeting as a form of citizen participation".

In the explanatory notes to the proposal of amendments to the LSGA, the government shed light on the government's understanding of PB as a form of citizen participation that is increasingly becoming the standard in modern local government. The proposal stated that examples of good practice, not only foreign but increasingly domestic, show that it is a relatively simple but effective mechanism for citizen participation in deciding on the financing of projects concerning the quality of life of the inhabitants of a certain area of the municipality. It was added that the proposed solution is not obligatory for municipal bodies, but it is regulated if, or when, municipal authorities decide to use it. The LSGA stipulates that the municipality determines the share of municipal funds, to be allocated for the projects to be proposed and voted on by the population, by budget decree. At the same time, the municipality is obliged – when they decide on such a solution – to consult the citizens. Because the LSGA neither prescribes any (obligatory) share of the municipality budget intended for the participatory procedure nor predetermines a methodology for citizen cooperation in the process, those issues are left to municipalities. They get to decide about the share of budgets, voting practice on proposed projects, etc. LSGA does not stipulate the voting procedure, etc., and therefore leaves many decisions regarding PB to municipal discretion. As a consequence, different voting practices have been established in Slovenian municipalities, for example; it is not uncommon for residents over the age of fifteen to be invited to participate even though they do not have the right to vote in general (or local) elections. While the reasoning for lowering the voting age (even for local elections) is often disputable (Franklin, 2020), the ability of young people to propose or vote on PB projects is not. In practice, Slovenian young people often have the opportunity to vote, given that the municipalities often use special PB mechanisms when deciding about youth projects. Notwithstanding the participation of the wider community in the budget procedure enacted at the municipality level, it should be emphasized that the only and exclusive proposer of the budget decree is the mayor of a concrete municipality, while the adoption of the budget decree is left to the municipal council. Since the amount of funds in the PB procedure is determined by the budget decree, activities for the inclusion of projects in the budget decree need to be carried out in advance. After the official proposal of the draft budget by the mayor, there is generally not enough time to carry out public consultation or gather proposals and vote on them. Some municipalities changed their statutes to the level that the statutes themselves determine the mandatory share of budget funds that need to be used via the PB mechanism each year, and the mandatory involvement of citizens by the municipalities in the preparation of the municipal budget in the form of a PB. For example, they did so in the municipality of Ajdovščina. In addition to the general provision on citizen participation in decision-making procedures, the statute of the municipality of Ajdovščina article 103 states that "the mayor is responsible for the preparation and submission of the municipal budget to the municipal council for adoption. The mayor prepares the draft budget by allocating part of the budget funds to the financing of projects directly proposed and selected by the citizens. Unless otherwise provided by another regulation of the municipality, funds in the amount of not less than 0.5 percent and not more than 1 percent of the annual budget of the municipality shall

be allocated for the financing of these projects." The Rules of Procedure of the Municipal Council of the municipality of Ajdovščina were also adjusted to this in the chapter on the adoption of the municipal budget and the chapter on occasional and permanent working bodies. While municipalities are free to change their statutes if they wish, such a commitment is very strong, since it must be honored every year, without exception. Additionally, for the change of the statute, a two-thirds majority in the municipal council is required, so it needs a broad political consensus. The mayors are therefore the main promotors of PB in their municipalities if they so choose. Mayoral discretion is the result of LSGA's understanding of PB as a facultative tool for citizen engagement.

Finally, the budgeting procedure at the municipal (budget) level is subject to the Public Finance Act (Article 18), according to which the municipal administration responsible for finance provides direct budget users with instructions for preparing the municipal budget, which also contains a framework proposal for two years. Within this scope, the municipality will also be able to determine the number of funds used to finance projects proposed by citizens. To include projects proposed by citizens, the populace must be consulted no later than the submission of the budget to the municipal council for adoption. By including projects proposed by citizens, the draft budget will then be drawn up using the applicable regulations governing the drawing up and preparation of the budget. Procedural rules regarding PB, if a municipality decides to use it, include some relatively strict rules and deadlines, and as such present an area in which municipalities enjoy less freedom in decision-making since they are connected to the state budget and state financing rules and regulations.

4 METHODOLOGY

The paper presents an in-depth content analysis of the Slovenian model of PB and the organizational and other prevailing sustainability aspects it promotes, as well as implementation results a few years after the enactment of the LSGA. The research descriptive methodology choice was based on the specifics of the research field and the fact that PB in Slovenia is at the early development stage of PB practices. The latter methodological approach provided insight into the current theoretical and legislative starting points on one hand and, later, an empirical review of practice on the other. Since PB is one of the collaborative, innovation models contributing to direct democratization, the paper contributes to a wider scientific area comprising sociology, public finance, public administration and local government.

A recent paper on Slovene PB practices defined a conceptual model that contains four determinants based on previous research: political, sociodemographic, economic, and municipal capability, stating among other things there is still room for research in areas such as mayors' attitudes towards PB and the adopted national legislation (Klun and Benčina, 2021: 202). In our research, we consequently focused in part on the organizational sustainability agenda of municipalities within PB practices, by gathering empirical evidence on the influence mayors' attitudes

and the adopted national legislation have on PB practices and the nature of the projects implemented. Municipal PB practices implementing inclusive, functioning, and continuous PB practices are in line with the organizational sustainability agenda. The second focus was on other types of sustainability of PB projects, and we analyzed the nature of implemented PB projects to try and determine if they are intended to improve the quality of life, are inclusive (intended for all the municipal inhabitants, with a possible special focus on vulnerable groups), participatory and therefore have a prevailingly social agenda in comparison to the economic and environmental dimensions of sustainable development.

The methodology is based on the review of secondary sources such as adopted legislation and available practice concerning PB in Slovenia, existing interviews, and research and analysis of data obtained from all municipal websites in Slovenia. We found out that 30 – out of 212 – municipal governments, have been engaged in PB projects at some time during the period from 2015 until 2021. In the first step, different reports on PB status in Slovenia were reviewed, and the websites of 212 municipalities and municipal associations were reviewed to determine which municipalities have implemented PB at any stage. In the second step, for the municipalities (or their parts) using the PB concept, the predetermined data were collected, such as the amounts of budget funds available for PB, the mechanisms used for the collection of citizens' proposals, the area of application (parts of the municipality or the whole), tools/mechanisms used for proposal voting, and the data about the impact of Covid-19 on voting practice. Special emphasis was given to the nature of projects implemented with respect to the type of sustainability they promote. The collected data and some research results are presented in tables 1-3.

5 RESEARCH RESULTS

5.1 THE ESTABLISHED PRACTICE OF PARTICIPATORY BUDGETING IN SLOVENIAN MUNICIPALITIES FROM 2015 TO 2021

Our research has revealed that the prevailing PB mechanism (supported also by municipality associations) is a 5-phase mechanism: (1) gathering project proposals, (2) evaluation of proposals by the municipal administration, (3) voting, (4) project implementation, (5) monitoring and communication of results. Focusing on the amount of funds used for the PB by concrete municipalities, and taking into consideration municipal total yearly budget expenditure, we concluded, that the amount used for PB projects is less than one percent on average. On the other hand, in the last few years, projects within PB were being in different ways in different municipalities. Some of the municipalities required a form on paper, which was brought in person or sent by mail, while some have digitalized the process either by use of different online tools (applications) or by sending the form by e-mail. Very similar procedures were obtained in the voting phase of the proposed project – people voted in person (in the same way as in general or local elections), in the general assembly of municipal residents, via different online tools (applications), by ordinary mail or email. Periodical dynamics of PB in the Slovenian municipalities and PB dimensions are presented in tables 1 and 2.

Table 1

Periodical dynamics of participatory budgeting in Slovenian municipalities

	2015	2016	2017	2018	2019	2020	2021
Number of municipalities	1	2	3	2	13	20	27

Source: Authors (2022).

Table 2

Participatory budgeting dimensions in Slovenia

Categories of observation		No. of municipalities (of 212 total)
PB mechanisms for proposals (some municipalities had multiple choices)	Form via e-mail	24
	E-form	11
	Form via ordinary mail	7
	Form on site	25
PB used for part or whole of the municipality area	More than 2 areas	26
	1 area	4
Voting practice (some municipalities had multiple choices)	Ballot on site	20
	Ballot by e-mail	4
	Ballot by ordinary mail	2
	Ballot in e-form	13
	SMS	1
Voting practice during the Covid-19 epidemic	In 2020 and 2021 voting took place	13

Source: Authors (2022).

Table 2 shows that the practice of Slovenian municipalities' PB processes differs among municipalities. The great majority (26) of 30 municipalities that introduced PB at some point in the last seven years have their municipalities divided into areas (single or combined local communities) for deciding on proposed local projects. Such a decentralized way enabled every part of the municipality to participate in development through projects meant to improve the quality of life in a specific area of the municipality. Usually, only projects targeting a specific population, e.g., youth, are decided (voted) on in a municipality as a whole. Additionally, the results revealed that the voting practice also differs significantly. The common ground is that municipalities use a wide variety of possible ways for local citizens to be able to propose projects to be voted on in a certain municipality, ranging from the use of special online tools (applications) to different forms sent to the municipality by ordinary post or e-mail or giving proposals on-site (at the seat of a municipality). Voting practices also differ between municipalities. The prevailing voting methods are (in the following order): (1) on-site, (2) via a special form sent by e-mail or ordinary mail to municipal or local community seat, (3) use of online tools (application, municipal internet site), (4) voting at a municipal (local community) assembly, (5) voting with the use of mobile phones (SMS). Regarding the effects the Covid-19 pandemic had on the use of the municipal PB

in Slovenia, we can conclude that it did not have much effect on most of the municipalities already practicing PB, yet some mayors used the epidemic as an excuse not to implement PB or even to discontinue its practice. Mayors promoting PB, used the epidemic period to implement new, innovative, and democratic ways to engage and include citizens (voting via e-mail, mobile phone (SMS), municipal internet site, use of online tools (applications)), while others used the epidemic to exclude citizens from participating in decision-making (e.g., the projects were chosen by an appointed committee).

5.2 ON (NON) EXISTING TENDENCIES TO INTRODUCE A (REPETITIVE) PARTICIPATORY BUDGETING PROCESS

Having already mentioned that only 30 municipalities (out of 212) practiced PB at one point between 2015 and 2021 and looking at the data for 2021, where only 27 municipalities practiced PB, we can conclude we lost some municipalities in the process. Since one of the criteria for PB is that it should be a continuous or a recurring process, we can state that a legislative soft approach to PB, which promotes PB as an optional tool, opens the doors wide to the possibility of discontinuing the PB process, as a result of a change in representatives or administration in a certain municipality. Such a change is usually a result of elections. In November 2018, regular local elections were held in Slovenia. All the candidates for mayors were sent a questionnaire[1], about whether they would support and implement PB in their municipality if elected – 57 of the mayors elected later replied they would. Four years later only 26 of these 57 candidates had kept their promise and implemented PB in their municipality. Looking at the data for 2021, provided by the Association of Municipalities and Towns of Slovenia (municipal representative association), there are 27 or 13 percent (out of 212) municipalities that use PB as a mechanism of redistributing municipal budget funds.[2] On the brighter side, there seem to be some mayors who did not pledge to implement the PB but later changed their minds. Although different practices exist worldwide regarding the implementation of municipal PB, certain criteria do exist, such as that it must include the whole or sometimes at least part of the budget, citizens must be included in the phase of proposing projects as well as the phase of deciding/voting on their implementation and that the practice of PB is a lasting one. Some Slovene municipalities do not implement the use of a PB since they believe they are already using PB, although the way they do it, does not comply with the presented criteria, and cannot be considered PB in practice – consultation with citizens and the use of different "open door" policies do not amount to PB. Two years after the local elections – in 2020 – an ex-post analysis was carried out to find out how many mayors kept

[1] The questionnaire was prepared and the answers analyzed by the NGO "Danes je nov dan", who are very active in the field of PB. They also adapted and upgraded for Slovenian needs an IT tool called Consul (it is an open source platform for the implementation of participatory budgeting.

[2] Municipalities of Ajdovščina, Bohinj, Brežice, Dol pri Ljubljani, Dravograd, Hrastnik, Hrpelje-Kozina, Komen, Izola, Koper, Kranjska gora, Krško, Logatec, Lovrenc na Pohorju, Maribor, Medvode, Nova gorica, Postojna, Radovljica, Renče – Vogrsko, Ruše, Semič, Sevnica, Slovenske konjice, Sveta Trojica v slovenskih goricah, Šentilj, Škofja loka, Tolmin. One municipality is not on the list although they carried out a PB in only one of its districts – municipality of Laško and municipality of Tolmin, which started with PB in 2021 but project will be carried out in 2022 and is aimed at youth projects.

their promise to use PB mechanisms in their municipalities if elected. How many did, was already presented, but more interesting are the answers received from municipalities and mayors who did not keep their promise and their explanations as to why not. Some of the more interesting answers are that (1) the idea itself is fine, but in our case, the responsiveness of the young people was below expectations, (2) we are of the opinion that the annual presentations of what has been done and planned at the nine village councils in the municipality are sufficient; both then and several times during the budget preparation process, residents are urged to submit proposals, which are ultimately decided on by the municipal authorities, (3) given current practice and modest budgets, PB will not be introduced, (4) we decided to transfer funds to municipal local communities (e.g., part of municipality) mainly because of the epidemic, but the interest in introducing real PB remains, (5) one municipality explained that they had already wanted to exchange good practices with representatives of another municipality, but then the epidemic deterred them from implementing PB; however, they intend to continue with its introduction in the next budgets, (6) another municipality explained that due to other project financial burdens, they are currently allocating money to village communities or city districts that decide on spending, however, they add that they are aware of the importance of cooperation and that the intention remains to introduce PB in the future, (7) since last year representatives of municipal local communities spoke out against the implementation of PB, which was then taken into account by the municipal administration, (8) one mayor explained that he supports PB, but sees a precondition for it in the consent of the parties in the municipal council, (9) another mayor assessed that the experience in the nearby municipalities, which undertook PB, was negative, and the implementation itself expensive, (10) yet another mayor estimates that PB involves marketing more than genuine participation, (11) one municipality explained that they carried out all the preparations last year, but then failed to carry out initial information workshops due to the epidemic. They currently plan to implement these next year, if necessary online, as funds are reserved in the draft budgets for 2021 and 2022, etc.[3] The given answers mostly show a misunderstanding of the basic concept of PB as being expensive, a burden, and not interesting enough to cause a high voter turnout. One of the (supposed) reasons (if not the prevailing one) behind the lack of implementation of PB is also the Covid-19 epidemic. On the other hand, if we would look at the experience of municipalities that are using PB mechanisms we can see they have mostly positive experiences. Even though the arguments received from different mayors and municipalities might not persuade us, it is their discretion as mayors, since they are exclusive proposers of the municipal budget, not to propose measures for the implementation of a PB in their municipality. PB is an optional and voluntary measure on the municipal level in Slovenia and no mayor can be legally forced to use it. That is why only 30 out of 212 municipalities (gradually) implemented it. The mayors are therefore the main promotors of PB in

[3] More answers of municipal representatives can be found on the home page of NGO "Mešanec" (https://mesanec.si/participativni-proracun-v-obcinah-krepi-se-zaupanje/), who made the ex post analysis.

PUBLIC SECTOR ECONOMICS
46 (4) 569-589 (2022)

their municipalities if they so choose. Mayoral discretion is the result of LSGA's understanding of PB as an optional tool for citizen engagement. As for now, these results show a lack of organizational sustainability since municipal PB practices are not mandatory or repetitive.

5.3 THE APPROVED PROJECTS WITHIN PARTICIPATORY BUDGETING OF SLOVENIAN MUNICIPALITIES: PREVAILING SOCIAL SUSTAINABILITY ASPECT

The analysis of the collected data about the municipal projects proposed in PB procedures has revealed certain similarities and common characteristics of those proposals. Projects suggested by citizens (and later carried out) in all analyzed municipalities in Slovenia are mostly projects aimed at improving the quality of life and living of the local population and visitors, implementation of the principle of PB in the municipality, promotion of active participation and involvement of citizens, and community building.

Citizens in Slovenia have suggested different projects ranging from building facilities for young or elderly people with specific socializing needs, different kinds of public infrastructure (bicycle and footpaths, public parking spaces, public lighting, etc.) to providing equipment supplies (drinking fountains, security fences, garbage bins, benches, heart defibrillators, etc.) and promoting culture, tourism and local heritage. Most of them, such as community events, are known to promote social sustainability in local communities (Stevenson, 2021). A closer look at the 23 (out of 27) municipalities implementing PB in 2021 and 2022 shows that there were 518 projects chosen for implementation.[4] The amount eligible for a single PB project varied from a few hundred (small projects such as seminar organization) to twenty thousand euros (usually PB projects related to infrastructure, e.g., new children's playground, putting, overlaying, or resurfacing a street with asphalt). There were even some PB projects valued at no cost such as putting up a new speed limit sign. Taking into account the nature or field of impact of these projects, all of them can be divided into four groups: (1) environmental projects (e.g., landscaping and upgrades of public areas, public parks, water areas, rest areas, picnic areas improvement, animal care), (2) recreational infrastructure projects (e.g., children's playgrounds, basketball courts, tennis courts, climbing walls, outdoor fitness), (3) public infrastructure projects (installation of fences, asphalting of paths, rest stops, public toilets, ecological waste disposals, sidewalks, installation of drinking fountains, arrangement of cemeteries, public lighting, traffic infrastructure (speed regulation), purchase of public events equipment, defibrillators), and (4) projects promoting tourism and culture (e.g. promotion of municipality, community events, installation of information boards, renovation of

[4] Municipalities and the number of projects carried out via PB mechanisms in 2021/2022: Ajdovščina (33), Bohinj (5), Brežice (14), Dol pri Ljubljani (11), Dravograd (19), Hrastnik (10), Hrpelje-Kozina (9), Komen (NDA), Izola (9), Koper (70), Kranjska gora (NDA), Krško (26), Logatec (10), Lovrenc na Pohorju (18), Maribor (44), Medvode (32), Nova gorica (33), Postojna (21), Radovljica (25), Renče – Vogrsko (NDA), Ruše (2), Semič (14), Sevnica (22), Slovenske konjice (29), Sveta Trojica v slovenskih goricah (NDA), Šentilj (28), Škofja loka (34).

PUBLIC SECTOR ECONOMICS
46 (4) 569-589 (2022)

tourist and cultural attractions, arrangement of cultural heritage, arrangement of village centers, organization of events/festivals, center' for intergenerational cooperation, education, socializing, culture and tourism promotion, outdoor entertainment facilities) (table 3). All of the four groups of PB projects, to a certain extent, promote social sustainability in the local environment.

Social sustainability as such, has been – in the last two decades – evoked to highlight the interdependence between social, economic, and environmental goals. Later a growing concern has arisen about the lack of implementation of policies aimed at eradicating poverty and social exclusion. There are calls for wider citizen participation, to provide local communities with new conditions to improve their quality of life (Falanga, Verheij and Bina, 2021). Social sustainability refers to equality, well-being, and balance across the quality of life indicators between sociocultural groups over time and from one generation to the next (Ross, 2013).

It is difficult to measure social sustainability since social sustainability indicators are contentious (Hale et al., 2019: 4). They can be individual (openness to new ideas, level of adoption of certain practices, usage of infrastructure, equipment), relational (level of trust between citizens and local administration, level of recognition of achievements), or institutional (level of promotion and civic engagement in PB processes and projects). One of the indicators for social sustainability in a municipality could therefore be citizen involvement (PB voter turnout), which differs in Slovene municipalities from up to one percent to almost forty percent. Low social sustainability indicators were often used by mayors and municipal administration as reasons for not implementing, or even discontinuing PB practices. Another could be the share of inclusive (available to everyone) PB projects. Parks and other public areas, infrastructure, and recreation facilities serve and are available to everyone – no matter your background, ethnicity, gender, or financial status – and all promote social sustainability in local communities.

Social sustainability is understood as a positive condition within communities, and a process within communities that can achieve that condition (McKenzie, 2004), determining the well-being of people and their right to be members of the community with the purpose of improving their living conditions, including human capital development, job creation, health, and safety. The development of the term "social sustainability" has gone through intensive academic discussion reflecting several different approaches and perspectives, resulting in the consensus that social dimensions and implications of sustainability undoubtedly connect with broader environmental (named also bio-physical) and economic issues and challenges (Eizenberg and Jabareen, 2017; Vallance, Perkins and Dixon, 2011).

Table 3

Most frequently planned or carried out projects in municipalities with implemented participatory budgeting practices

Nature of PB project	Environmental	Recreational infrastructure	Public infrastructure	Promotion of tourism and culture
Number and percent of chosen PB projects (of 518 total)	45 8.7%	146 28.2%	236 45.6%	91 17.5%

Source: Authors (2022).

The participatory budgeting projects in different municipalities share some common characteristics, which can be combined in the term "socially oriented". It is more than obvious that citizens prefer projects with intensive social components, covering quality of life, public spaces, social infrastructure, basic needs, social capital, justice, equity, etc. Interestingly, those needs are still more essential (e.g., public and recreational infrastructure projects represent almost three quarters of all PB projects), while needs addressing cultural, environmental, humanitarian, and other aspects, lag behind. The municipal PB projects implemented do not address some typical social sustainability goals such as ending poverty and hunger, employment, health issues, which seem to be reserved for the state or even international level. The municipal PB projects rather reflect the peoples' tendencies of understanding the role of municipalities in providing a certain local-level public infrastructure in local communities which is available to everybody for general use and in turn heightens the quality of life by providing safety, access to goods, leisure and sports activities, etc. in a community. These results can be interpreted as showing that citizens' awareness about the high quality of life has increased; they also point out that people in smaller/rural/less developed municipalities do not want to fall behind larger/urban more developed municipalities in terms of social infrastructure, quality of life, etc. The result is that PB is predominantly understood among the local population as a tool for implementing different "public infrastructure projects", aimed at increasing a variety of already presented social sustainability goals.

6 DISCUSSION

Even though the LSGA does not directly mention the term PB, there is no doubt that it gives explicit legal ground for the use of optional PB on the municipal level. Referring to the financial autonomy of municipalities on the expenditure side, the legislature did not decide to regulate PB as a mandatory tool in the budget preparation and execution process. However, the optional PB concept was legally adopted in 2018, while the first PB pilot project was conducted in 2015. Such regulation implements a constitutional understanding of the financial autonomy of municipalities and acknowledges their discretion when deciding on the use of PB measures. Some discretion is left to municipalities even with respect to the definition of funds intended for PB, deciding on who can propose projects, and how, and vote on them, etc. as long as public finance rules are obeyed.

Numerous positive effects of PB mechanisms have been identified, such as information sharing, oversight, accountability, knowledge, and the creation of policy networks, to increased efficiency of the spending of funds, faster economic growth, more balanced development of urban and rural municipalities, reducing social disparities, better management, and identification of infrastructure, increased confidence in democratic processes, increased activation of the population, etc. (Touchton and Wampler, 2014; Mathebula, 2015; Radu, 2019). Some of those can be confirmed also for Slovenia, such as increased activation of the population, and better identification of (social) public infrastructure. Nevertheless "a soft approach" to PB regulation does not seem to have brought the desired results in the short period, which can be confirmed by our results and the fact that three years after the legislation enactment, only fourteen percent of municipalities have used PB. It is clear that the share of municipalities applying PB is low, and consequently, the overall impact is lacking. What is the reason for this?

Probably, among other reasons, it can be found in the views of some mayors, who see PB as expensive, burdensome, and not interesting enough to cause a high voter turnout. As a result, they decided not to propose PB, due to the discretion they have in managing the municipal budget area. On the other hand, the mayors with positive attitudes towards PB stated that it should be left to the individual municipality to develop a tailor-made "systemically, financially, personnel and technically sustainable model for the implementation of PB". All of the above leads us to the conclusion that municipal autonomy, mayoral discretion, promotion of democracy, transparency, and positive examples seem to be the right organizational model for the prevailing number of municipalities in Slovenia. The soft state-established legal-ground approach for practicing PB, therefore, has not resulted in a widespread PB practice at the municipal level and is not in line with the organizational sustainability concept of municipal PB as an inclusive, functioning, and repeatable process.

As far as the prevailing social sustainability aspect is concerned, the challenges of the Slovenian PB model are much more complex and must be thoroughly reconsidered. The numerous and varied scientific contributions have led to a certain degree of conceptual and terminological chaos, which compromises the usage of the term social sustainability. While some authors are clearly focused on basic needs and primarily address the "underdevelopment" of the general sustainability concept, others consider changing the behavior of the affluent elite and promoting stronger environmental ethics. This wide spectrum of views is spread also among those who see social sustainability more in terms of maintaining or preserving preferred ways of living or protecting particular socio-cultural traditions (Vallance, Perkins and Dixon, 2011).

The results of our research showed that the social sustainability term is understood only in part, and interpreted by partial (own) interests and ideological predispositions, on local as well as national levels. The accelerated and efficient development of this concept requires a deeper understanding of the social dimensions of the term sustainability and its potential conflicts with environmental and economic aspects.

PUBLIC SECTOR ECONOMICS
46 (4) 569–589 (2022)

Does PB play an important role in promoting social sustainability projects? With a closer look at the nature of the projects selected by local inhabitants participating in the PB process in Slovenia, it would seem small(er), less expensive projects play a greater role than one might think. One of the reasons is that municipalities grant a limited amount of funds to be used for PB projects, usually ranging from a couple of hundred or thousand euros to a few ten thousand euros – up to one percent of the municipal budget. The second would seem to be that citizens choose projects and topics directly connected to their free time and personal interests (leisure, recreation, health, security, etc.). Such needs of the local population living in a certain community can be mostly satisfied with simple measures and investments which improve the quality of life in a certain area. For example, the goals of social sustainability regarding small public transport infrastructure projects are that the infrastructure is fair and equitable, respects human safety, security and health, promotes community development, and cultural heritage preservation (Lozano, Dueñas-Osorio and Padgett, 2014). The diversity of projects is a natural result of the different interests of the local population. Some interests are probably common and those projects addressing such interests get the most votes. To satisfy all of the local population, at least to some extent, a multitude of different projects must be proposed and chosen, addressing different topics. That is why some municipalities organize special youth PB projects, having in mind the younger population has specific needs and interests.

As long as we understand the municipal social sustainability aspect as one promoting PB projects aimed at improving the quality of life and living of the local population in every municipality, we can conclude that in municipalities where PB is practiced, it is used in line with the municipal social sustainability agenda.

Referring to research starting points and the results of our analysis, holistic and critical assessments of the role and significance of the PB concept from different perspectives are needed in Slovenia. The basic platform for an objective assessment of the PB concept success in Slovenia (and probably also in other countries of the world) should focus on reflections and potential responses to the following questions and findings:

- What share of municipalities' budgets should be planned for PB?
- Should the PB procedure be uniform and centralized for all municipalities in the country?
- Can the explicit benefits and costs of the procedure be assessed and what are the concrete weaknesses of the concept?
- Should transparent (separate) financial reports be published?
- How is one to balance and harmonize the interests and wishes of citizens with the interests of economic initiatives and the broader socio-political community?
- How can one decide about projects in which the professional judgments in line with municipal authority and citizens' wishes conflict?

– One possible area of research should also focus on the fact that many municipal PB projects are localized. In small municipalities, this poses a challenge since PB is not understood as an inter-municipal tool, while public infrastructure often crosses municipal borders (roads, bicycle paths, parks, etc.). For such public infrastructure to be truly inclusive and improve the quality of living of local residents, projects should be implemented to their fullest possible extent. Similar is the situation with bordering municipalities in different countries. Some tools of cross-border cooperation do exist but do not include multi-municipal PB practices. Issues regarding cross-municipal and state need to be put on future research agendas.

Because previous research papers have not comprehensively addressed these issues and dilemmas, future research projects in the field of PB should focus on a thorough analysis of the related problems and effects of PB in the municipal environment, as well as an investigation of wider implications of PB on socio-political development on the national level.

7 CONCLUSIONS

Participatory budgeting has developed as one of the collaborative innovation models contributing to sustainability and participatory politics improvement. Starting in Latin America, it has spread into Europe and other parts of the world. This trend reached Slovenia as a pilot project in 2015.

Our research results show that only fourteen percent of municipalities started the practice of PB in the last seven years. For some, it was only a one-time thing, and they did not repeat the practice. There were different tools for the citizens' project proposals used as well as different possibilities of voting for those. As far as PB funds are concerned there are no major differences among municipalities using PB practices, e.g., up to one percent of municipality funds were allocated to PB, while some differences can be identified in other areas. For instance, more than one-third of municipalities' decided on implementing limitations regarding the exercise of the right to vote during the Covid-19 pandemic, e.g. voting in 2020 was possible only with the use of a digital application.

The results of our research also indicate that the PB concept is not widely spread among Slovenian municipalities. In this aspect, the Slovenian PB concept enables an optional approach and flexible forms of participatory democracy and PB practices at a local level, which can adapt to changing circumstances and demands of specific municipalities.

Our results can serve as reminders to legislators in other countries that a soft legislative approach promoting the understanding of municipalities as "self-governing", leaving discretion regarding the implementation of municipal PB procedures to municipal authorities does not bring about the desiderated results of widening the use of inclusive, repetitive PB practices.

Municipalities themselves have discretion, to decide (1) whether they will use PB or not, (2) what amount of funds they will set aside for PB projects, (3) who can participate in the project proposal and selection process (different voting age limitations), (4) where PB will be organized – part of a municipality or a municipality as a whole. Such a soft approach supported by flexible state legislation of the PB concept is in line with the constitutionally accepted understanding of the financial autonomy (self-government) of municipalities and mayoral discretion. As such it had little effect on the intensity of implementing functional and repeated/sustained PB practices in Slovenian municipalities and on the organizational aspects of PB, which are left to the discretion of municipal authorities. This understanding of the PB concept allows municipalities to be better equipped – if they choose to – at addressing different challenges in the future and promoting projects of social sustainability in the municipal competence area. As far as social sustainability is concerned, existing municipal PB practices are in line with the social sustainability agenda and there is potential for development and growth, if the use of PB practices extend to other municipalities.

Disclosure statement

All authors declare that they have no conflicts of interest.

REFERENCES

1. Bednarska-Olejniczak, D., Olejniczak, J. and Svobodová, L., 2020. How a Participatory Budget Can Support Sustainable Rural Development – Lessons from Poland. *Sustainability*, 12(7), 2620. https://doi.org/10.3390/su12072620
2. Bland, G., 2017. Sustainability as a measure of success: Externally promoted participatory budgeting in El Salvador 10 years later. *Public Administration and Development*, 37(2), pp. 110-121. https://doi.org/10.1002/pad.1788
3. Boc, E., 2019. The Development of Participatory Budgeting Processes in Cluj-Napoca. *Transylvanian Review of Administrative Sciences*, 15(58), pp. 38-51. https://doi.org/10.24193/tras.58E.3
4. Broman, G. I. and Robèrt, K. H., 2017. A framework for strategic sustainable development. *Journal of Cleaner Production*, 140, pp. 17-31. https://doi.org/10.1016/j.jclepro.2015.10.121
5. Cabannes, Y., 2004. Participatory budgeting: a significant contribution to participatory democracy. Environment and Urbanization, 16(1), pp. 27-46. https://doi.org/10.1177/095624780401600104
6. Caldas, P., Dollery, B. and Marques, R. C., 2020. Measuring what matters in local government: a Municipality Sustainability Index. *Policy Studies*, 43(4), pp. 738-758. https://doi.org/10.1080/01442872.2020.1726311
7. De Vries, M. S., Nemec, J. and Špaček, D., 2022. *International Trends in Participatory Budgeting*. Cham: Palgrave Macmillan.
8. Eizenberg, E. and Jabareen, Y., 2017. Social sustainability: A new conceptual framework. *Sustainability*, 9(1), pp. 68. https://doi.org/10.3390/su9010068
9. Falanga, R., Verheij, J. and Bina, O., 2021. Green(er) Cities and Their Citizens: Insights from the Participatory Budget of Lisbon. *Sustainability*, 13(15), 8243. https://doi.org/10.3390/su13158243.
10. Franklin, M. N., 2020. Consequences of Lowering the Voting Age to 16: Lessons from Comparative Research. In: J. Eichhorn and J. Bergh, eds. *Lowering the Voting Age to 16*. Cham: Palgrave Macmillan. https://doi.org/10.1007/978-3-030-32541-1_2
11. Glavič, P. and Lukman, R., 2007. Review of sustainability terms and their definitions. *Journal of cleaner production*, 15(18), pp. 1875-1885. https://doi.org/10.1016/j.jclepro.2006.12.006
12. Hale, J. [et al.], 2019. Social sustainability indicators as performance. *Geoforum*, 103, pp. 47-55. https://doi.org/10.1016/j.geoforum.2019.03.008
13. Kardos, M., 2012. The reflection of good governance in sustainable development strategies. *Procedia – Social and Behavioral Sciences*, 58, pp. 1166-1173. https://doi.org/10.1016/j.sbspro.2012.09.1098
14. Kim, S., 2016. Participatory governance and policy diffusion in local governments in Korea: Implementation of participatory budgeting. *KDI Research Monograph*, No. 2016-01.
15. Klun, M. and Benčina, J., 2021. Predictors, Determinant Groups, and Participatory Budgeting. *Slovak Journal of Political Sciences*, 21(2), pp. 186-208. https://doi.org/10.34135/sjps.210204

16. Law on Amendments to the Local Self-Government Act (The proposal, EVA 2016-3130-0016).
17. Leminen, S. [et al.], 2021. Collaborative innovation for sustainability in Nordic cities. *Journal of Cleaner Production*, 328, 129549.
18. Littig, B. and Grießler, E., 2005. Social sustainability: a catchword between political pragmatism and social theory. *International Journal of Sustainable Development,* 8(1), pp. 65-79. https://doi.org/10.1504/IJSD.2005.007375
19. Lozano, L., Dueñas-Osorio, L. and Padgett, J., 2014. The Social Sustainability Index for Small Infrastructure Projects: A Proposition. *International Journal of Social Sustainability in Economic, Social and Cultural Context*, 11(1), pp. 27-38. https://doi.org/10.18848/2325-1115/CGP/v11i01/55252
20. Mathebula, N., 2015. Community participation in the South African local government dispensation: a public administration scholastic misnomer. *International Public Administration Review*, 13(3-4), pp. 185-199. https://doi.org/10.17573/ipar.2015.3-4.08
21. McCarthy, L. I., 2021. *Participation, Deliberation, and Local Government: The Connection Between Cambridge Participatory Budgeting and Civic Engagement*. Doctoral dissertation. Tufts University.
22. McKenzie, S., 2004. Social Sustainability: towards some definitions. *Hawke Research Institute Working Paper Series,* No. 27.
23. Milosavljević, M. [et al.], 2020. Participatory Budgeting in Serbia: Lessons Learnt from Pilot Projects. *Lex Localis*, 18(4), pp. 999-1021. https://doi.org/10.4335/18.3.999-1021(2020)
24. Oross, D. and Kiss, G., 2021. More than just an experiment? Politicians arguments behind introducing participatory budgeting in Budapest. *Acta Politica*. https://doi.org/10.1057/s41269-021-00223-6
25. Public Finance Act (Official Gazette of the Republic of Slovenia, No. 11/11 – official consolidated text, 14/13 – amended, 101/13, 55/15 – ZFisP, 96/15 – ZIPRS1617, 13/18 and 195/20 – US).
26. Radu, B., 2019. The Impact of Transparency on the Citizen Participation in Decision-Making at the Municipal Level in Romania. *Central European Public Administration Review*, 17(1), pp. 111-130. https://doi.org/10.17573/cepar.2019.1.06
27. Ross, D., 2013. Social Sustainability. In: S. O. Idowu [et al.], eds. *Encyclopedia of Corporate Social Responsibility*. Berlin; Heidelberg: Springer. https://doi.org/10.1007/978-3-642-28036-8_58
28. Scipioni, A. [et al.], 2009. The Dashboard of Sustainability to measure the local urban sustainable development: The case study of Padua Municipality. *Ecological indicators*, 9(2), pp. 364-380. https://doi.org/10.1016/j.ecolind.2008.05.002
29. Sgueo G., 2016. *Participatory Budgeting: An Innovative Approach*. https://doi.org/10.2139/ssrn.2712213
30. Sintomer, Y., Herzberg, C. and Röcke, A., 2008. Participatory budgeting in Europe: potentials and challenges. *International Journal of urban and regional research*, 32(1), pp. 164-178. https://doi.org/10.1111/j.1468-2427.2008.00777.x

31. Spada, P., 2014. The diffusion of participatory governance innovations: a panel data analysis of the adoption and survival of participatory budgeting in Brazil. *Latin American Studies Association*, 32, pp. 1-53.
32. Stevenson, N., 2021. The contribution of community events to social sustainability in local neighbourhoods. *Journal of Sustainable Tourism*, 29(11-12), pp. 1776-1791. https://doi.org/10.1080/09669582.2020.1808664
33. Stortone, S., 2010. Participatory Budgeting: Heading Towards a 'Civil' Democracy? In: M. Freise, M. Pyykkasnen and E. Vaidelyte, eds. *A Panacea for all Seasons?: Civil Society and Governance in Europe*, pp. 99-121. https://doi.org/10.5771/9783845222417-99
34. Touchton M. and Wampler B., 2014. Improving Social Well-Being Through New Democratic Institutions. *Comparative Political Studies*, 47(10), pp. 1442-1469. https://doi.org/10.1177/0010414013512601
35. Umar, M. A. [et al.], 2018. Public governance quality and tax compliance behaviour in developing countries: the mediating role of socioeconomic conditions. *International Journal of Social Economics*, 46(3), pp. 338-351. https://doi.org/10.1108/IJSE-11-2016-0338
36. United Nations, 1987. *Report of the World Commission on Environment and Development*. New York: United Nations.
37. United Nations, 2015. *The Sustainable Development Agenda*. New York: United Nations.
38. Vallance, S., Perkins, H. C. and Dixon, J. E., 2011. What is social sustainability? A clarification of concepts. *Geoforum,* 42(3), pp. 342-348. https://doi.org/10.1016/j.geoforum.2011.01.002
39. Vargas-Hernández, J. G., 2021. Strategic Organizational Sustainability. *Circ. Econ.Sust.* 1, pp. 457-476. https://doi.org/10.1007/s43615-020-00003-y

National institutional arrangements for implementation of the Sustainable Development Goals: A five-year stocktaking, World Public Sector Report 2021

UNITED NATIONS
Division for Public Institutions and Digital Government,
Department of Economic and Social Affairs, New York, 2021, pp. 186
https://publicadministration.un.org/en/Research/World-Public-Sector-Reports

Book review by DAGMAR RADIN*
https://doi.org/10.3326/pse.46.4.7

* Received: February 25, 2022
Accepted: February 27, 2022

Dagmar RADIN, Ph.D.
Faculty of Political Science, University of Zagreb, Lepušićeva 6, 10000 Zagreb, Croatia
e-mail: dagmar.radin@fpzg.hr
ORCiD: 0000-0002-8636-9516

PUBLIC SECTOR ECONOMICS
46 (4) 591–596 (2022)

To assess progress towards the goals of the United Nations 2030 Agenda for Sustainable Development, the Department of Economic and Social Affairs (DESA) has issued the 2021 World Public Sector Report with a focus on the national institutional arrangements in twenty-four countries. The 2021 Report differs from the 2019 one as it focuses on the evaluation of the progress made since the beginning of the implementation in 2016. It takes into consideration the challenges set forth by the COVID 19 pandemic and its effects on the ability of public institutions to respond while upholding the principles and adjustments needed for the achievement of the SDGs. The Report focuses on: the evolution of institutional arrangements for SDG implementation; the development and performance of monitoring and evaluation systems for the SDGs; and evaluation of the efforts made by governments and other stakeholders to boost public servants' capacity for SDG implementation.

Five years into the implementation of the 2030 Agenda on Sustainable Development, the UN DESA has completed the *2021 World Public Sector Report,* which focuses on the evaluation of national institutions in their ability to move towards the achievement of the Sustainable Development Goals (SDGs). Institutions represent a key element in countries' abilities to achieve the SDGs as they represent the framework for, and one of the first steps in, the successful achievement of the goals as strong institutions are a necessary precondition for economic and political development resistant to exogenous shocks.

Given that 2021 marks one-third of the way into the implementation process of the Agenda, evaluation of the progress of the institutional arrangements is timely and appropriate, particularly because, since the last Report, of 2019, the emergence of the COVID 19 pandemic is likely to represent a significant disruptor of this process. Thus, it is extremely important to take stock of the progress that has been made as the Report can be used by countries to self-assess and recalibrate their own progress while taking into consideration the new lessons to be learned from the pandemic shock.

The Report is focused on three areas of SDGs implementation: the first chapter evaluates the development of institutional arrangements, the second one evaluates the progress and development, in addition to the strengths and weaknesses of the monitoring strategy, while the third chapter analyses the efforts by governments and other stakeholders to increase the capacity of public servants. The fourth, and final, chapter looks at the impacts of COVID-19 on national institutional arrangements for SDGs implementation.

The Report focuses on a sample of 24 countries and was created by a desk review based on multi-sourced, tiered approaches that relied significantly on voluntary national reports, national sustainable goal strategies, legal and policy documents, academic articles, reports and evaluations produced by NGOs in different languages. Thus, the level of analysis is at the national level. The countries were then

PUBLIC SECTOR ECONOMICS
46 (4) 591-596 (2022)

compared using a matrix that made it possible to compare the diverse data and sources. For the area of monitoring and review evaluation, the team additionally administered a questionnaire filled out by international organizations active in these fields.

The Report begins with the Executive Summary presenting, in a concise but provocative manner the main outline of the chapters and their findings but without giving too much away in terms of the conclusion, thereby inviting the reader to delve deeper. The first chapter evaluates the institutional settings and their changes and developments since 2016. It outlines the diversity of the paths that countries have taken in their institutional progress, pointing out that there is no specific right or wrong path or pattern to the approach to institutional framework development. Some similarities are noted, such as the need to identify and establish high-level coordination structures, but in order to compare different cases, the authors focus on the following: adaptation of legal and regulatory frameworks at the national level; the integration of the SDGs into national strategies; the development of the SDG implementation roadmaps; the creation of piloting governmental structures; and the development of national monitoring and reporting including SDG evaluation frameworks and hubs. Other areas included are SDG implementation financing and capacity building, both important as they indicate the level of commitment national governments have to supporting the successful implementation of the Agenda. While the Report uses graphs and charts to depict the level of progress and how countries measure against one another on this issue, the textual part of the Report depicts more in-depth examples in order to illustrate different approaches to institutional development, through the explanation of the development of a particular legal framework, which allows for a direct comparison of two countries. Such is the case of Colombia and Spain, which both established a high-level body by executive decree. In addition, the Report makes use of separate and highlighted text boxes to identify country cases: Mongolia's Law on Development Policy and Planning as a basis for the implementation of the SDGs, Brazil's executive actions, coordination structure examples from different countries, and so on. These cases provide great examples. detailing the otherwise macro level view of the Report and contributing to a better understanding of the countries in the study. The second chapter focuses on the analysis of the countries' monitoring, follow up and review system integration into existing structures to avoid parallel structures. The analysis shows the different degrees of countries' institutionalization, how they inform policy makers in the progress towards the goals, and where there is room for improvement. The resources for the chapter come from secondary literature as well as from an in-depth analysis of audits, evaluations, and other assessments. The chapter defines the key concepts measured (monitoring, evaluation, follow-up, review, and reporting) to clarify the starting points. In the process of analysing the structures of the monitoring and evaluation (M&E) system, they make distinctions among the four different models of mechanism that most of the 24 countries fall into, differentiating them with respect to level of complexity and institutionalization. In evaluating the progress of the M&E systems over time, the

PUBLIC SECTOR ECONOMICS
46 (4) 591–596 (2022)

Report indicates that most countries have been significantly focused on the identification of indicators for M&E, which has taken considerable time and is still ongoing. Thus, the level of maturity of the SDG monitoring and evaluation indicators is at different stages, with several countries having no indicator framework set up as of 2019. The chapter further details segments of the analysis for each country as well as the level of progress achieved in tables and charts showing that the most progress (in 96% of countries) has been made in the assessment of the availability of national indicators. What makes the chapter rich in content and diverse in its approach is the variety of examples of countries and samples of countries for M&E segments: the disaggregation of indicators for various SDGs in Costa Rica, the challenges of mainstreaming SDGs in Colombia and the Voluntary National Reviews (VNRs) by region, as well as the illustration of the detailed VNR process in Finland. What is notable at the end of each section of the second chapter is the special reference made to how the COVID 19 pandemic has affected each segment of the analysed M&E process. Among many of the interesting findings of this chapter, the authors remark that federal and highly decentralized states present a more institutionalized monitoring system, while some unitary or highly centralized states present examples of strong subnational monitoring frameworks and highlight the increasing development of the subnational monitoring systems.

While the previous chapters look at the institutional framework and capacity to implement and to monitor such implementation of the SDGs, the third chapter looks at the progress in public servant capacity building at the national level. The objectives of the chapter are to describe the environment of actions undertaken to build capacity of public servants, and to evaluate the results and impacts of such actions in the meeting of the country needs. When talking about capacity building, the chapter focuses on actions targeting public servants implemented by any actor at the international and national level, rather than the financial aspects of SDG implementation. The chapter relies on information published by key institutions and focused on different thematic areas of the activities. The first part of the chapter looks at the assessment of the needs for national capacity where it seems that the biggest capacity gaps as reported by the VNRs are in the above-mentioned monitoring and reporting capacity, followed immediately by institutional capacity. The section that follows analyses the national strategies for capacity building for SDG implementation in public administration, focusing on the case of Spain which seems to clearly stand out as country with the adoption of a government-wide approach to strengthening the capacity of public administration. Looking at the actors involved in capacity building, the chapter highlights both national and international actors that have taken important roles in collaborating and operating at different levels such as the collaboration of the UNDP and other UN agencies with other national and international organizations, as well as the collaboration between civil society organizations and development agencies. The analysis of capacity building extends to other subnational actors such as the university and school level capacity assessment in terms of their pedagogical inclusion, raising awareness of the SDGs among public servants, and incorporating the SDGs into

continued public servant training. Finally, the chapter assesses the guidelines for the achievement of long term development planning with the inclusion of the SDGs at the domestic level, as also addressing how to localize the efforts of SDG implementation, strengthen the national statistics with respect to SDG reporting, and other things. This chapter, in line with those before it, includes numerous country-specific examples at different stages of the analysis, as well as a toolkit and examples on how to strengthen capacity building of public servants in specific segments, such as raising awareness. The chapter concludes with a set of recommendations targeted towards various actors.

The fourth thematic chapter of the Report focuses on the impact of the COVID 19 pandemic on the progress made by public institutions in implementing the SDGs. More specifically, the Report looks at how the pandemic has disrupted progress towards the implementation of the SDGs from the perspective both of the ability of governments to prioritize SDG implementation in light of the crisis and of the support and steering national governments are able to provide to institutional arrangements in moving towards the goals. The first part of the chapter looks at the risk of the loss of salience of the SDGs at the international level, the impact on governmental capacity to manage and monitor progress towards the SDGs and the risk of losing the financing to accomplish it. The second part of the chapter focuses on how the pandemic has affected the work of public institutions given the limitations on the availability of public servants which, in some cases, forced the public administration to adopt new methods of participatory processes to ensure involvement of all stakeholders, such as the case of Ankara, Turkey, and the way public administration managers operate in other countries. The pandemic has also affected the science-policy relationship, as well as the communication between the government and citizens which has been crucial in establishing a relationship of trust. However, the section concludes with an analysis of the limitations that digital governance has had across different parts of the world, given limited communication infrastructures. The next section looks at horizontal policy integration during and after the pandemic, and its impact on inequality and intergenerational equity. In analysing the impact on vertical policy integration during the pandemic and its impact on the tensions among the different levels of government and on stakeholder engagement, the general conclusions point to the need to persevere in creating a public space to integrate civic engagement in decision making as well as to increase accountability. The next part of the chapter, in fact, focuses on national accountability in terms of transparency and access to information, both in evaluating the movement towards an open government as well as the assessment of the risk of increased corruption that the pandemic has introduced. The Report recommends increased public participation, greater transparency and openness as tools that can reduce the corruption risk associated with the processes of the COVID 19 pandemic. The last part of the fourth chapter addresses the importance of trust in public institutions to promote societal change and sees the extraordinary situations brought about by the pandemic as an opportunity to strengthen the societal contract and trustworthy institutions. Norway is presented as an example of a

PUBLIC SECTOR ECONOMICS
46 (4) 591–596 (2022)

way in which social trust was able to be preserved during the pandemic. The chapter closes with a focus on the need to strengthen the capacity of the public service to foster societal change.

The brief conclusion to the Report lists a number of short- and medium-term recommendations. It offers a tabular summary of the strengths and challenges for each analysed dimension, including institutions, data and indicators, subnational levels of government, VNR processes, national reporting, stakeholder engagement, policy coherence and integration, and feedback loops.

To summarize, the World Public Sector Report 2021 represents a useful assessment of the state of the SDG implementation process since its inception. It gives a broad perspective, while incorporating snapshots of different countries, on the state of the progress in the light of the COVID 19 pandemic which on the one hand added a challenge to the existing implementation difficulties, but on the other, has also highlighted the weak links of the process and the need to remain adaptable in policy implementation.

Institute of
Public Finance