OECD Fiscal Federalism Studies

Fiscal Decentralisation and Inclusive Growth

Edited by Junghun Kim and Sean Dougherty

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Foreword

The rules and practices that govern fiscal relations among different levels of government administration, such as their respective responsibilities in tax, spending and debt management, have a bearing on economic efficiency and ultimately growth. A growing body of evidence also links intergovernmental fiscal arrangements with income distribution within countries.

For example, investment in education and skills affects the performance of students and the accumulation of human capital, which are essential drivers of growth and important determinants of individuals' earnings potential. At the same time, responsibility for education and skills programmes, including design, financing and service delivery, is assigned to different levels of government. Understanding how intergovernmental fiscal relations affect performance — in these and other policy areas — can therefore do much to inform policymaking in pursuit of more efficient and inclusive outcomes.

This volume provides insights and experiences from academics and practitioners on key aspects of intergovernmental fiscal relations and how they can influence economic growth and the distribution of income. In addition to several cross-country studies, empirical analysis of the Dutch, Korean, Indian and English experiences are included.

The discussions in this book are based on a workshop in May 2017 including discussants and participants from the four constituent directorates of the OECD Network on Fiscal Relations Across Levels of Government. We are grateful to the authors who revised their conference presentations to make this publication possible. We also thank the delegates of the Fiscal Network for participating in the conference, and to Bonifacio Agapin for assistance in editing the conference papers. Financial support from Korea to cover the cost of this publication is gratefully acknowledged.

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Table of contents

Tables

Figures

Executive summary

Fiscal decentralisation and inclusive growth

Over the last decade or more, many countries have experienced slowing productivity growth and a rising concentration of income. Concerns about these developments have motivated a broadening of the policy discussion about how to ensure that economic growth is made more inclusive and multidimensional. One important channel for addressing these concerns is through intergovernmental fiscal relations. By providing the "right" incentives and improving rules and practices in policy making, these institutions can shape fiscal policy and multidimensional outcomes at all government levels.

Design of decentralisation, reform options and the impact on outcomes

Earlier work published in the Fiscal Federalism Studies has shown that the stage of economic development and political economy constraints play important roles in determining the success of fiscal decentralisation. Rather than rely on unique prescriptions, policymakers should consider the importance of institutional complementarities to reap the full potential of fiscal decentralisation. The volume reinforces this message, and demonstrates the importance of considering country specificities in addition to policy design principles when reforming intergovernmental institutions and transfer systems.

Several chapters herein address the basic design of fiscal federalism and associated reforms. One overarching finding is that balanced decentralisation – that is, when the various policy functions are decentralised to a similar extent – is conducive to growth. Similarly, the efficiency of public service delivery in education and health is found to be conditional on sufficient political and institutional capacity. Balanced decentralisation allows sub-national governments to better co-ordinate policy and to reap economies of scale and scope across functions. Moreover, a country's scope for achieving growth that is also inclusive varies widely depending on its characteristics and its public finance mix.

Spending and revenue decentralisation tends to boost economic growth for economies that have a relatively higher degree of globalisation, based on the analysis in this book. Fiscal decentralisation has a more ambiguous effect on inequality than on growth, especially for economies with a higher degree of openness. Moreover, for some countries, there is an apparent trade-off between growth and equity, when it comes to the "optimal" degree of spending and revenue decentralisation. A potential trade-off between efficiency and inequality is also examined in an analysis of education financing decisions, which looks at the link between local education funding and inequality. However, a range of country-specific policies tend to offset potential trade-offs.

"Design is in the details"

Given the complexity of cross-country results, the chapters include detailed examinations of various aspects of intergovernmental relations in Korea, the Netherlands, India and the United Kingdom. These analyses broadly mirror the cross-country findings, yet they also qualify them in terms of the difficulties in achieving various objectives. For instance, the analysis of Korea's education financing system finds that it could benefit from more decentralised financing, both in terms of overall outcomes and equity. Empirically, heightened inequality tends to induce more spending on educational opportunitites for lower income populations. This analysis also finds that lower-scoring populations benefit the most from enhanced public educational investment.

Modelling of the Netherlands' tax system shows that the design of local revenue collection, such as on immovable property, can have substantial distributional effects. Policy scenarios in which the tax burden is shifted towards immovable property show that the tax shift can yield a moderately positive impact on employment, minimising the distributional effects.

Empirical estimates of India's transfer system suggests that special transfers do not achieve the objective of providing a more comparable level of public services across states at different income levels. While special purpose transfers are intended to ensure a minimum standard, the analysis finds that there are too many specific purpose transfers, and these are poorly targeted. A reform of the fiscal transfer system is suggested.

In a simulation of the UK's local finances, not only the mix of funding sources matters for incentives, but the rules around tax and fee policy matter. Even if revenues are initially fully equalised relative to assessed spending needs, significant fiscal disparities can re-emerge in just a few years. Examining the trade-offs between equalisation and incentives inherent in sub-national finance reveals the importance of design choices.

The volume includes both cross-country studies and insights into reforms from individual countries, with several chapters written by experts closely involved in both institutional reform and the day-to-day operation of fiscal relations. The studies show how much the design of policy and institutions matters, even if reforms often happen slowly. The book is a sequel to *Institutions of Intergovernmental Fiscal Relations: Challenges Ahead* (OECD and KIPF, 2015), broadening and deepening the issues covered there. It also provides insights and experiences from academics and practitioners on key aspects of intergovernmental fiscal relations and how they contribute to inclusive growth. Discussions were fostered by the annual meetings of the OECD Network on Fiscal Relations Across Levels of Government.

Chapter 1

Fiscal decentralisation and inclusive growth: An overview

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Inclusive growth is now high on government agendas in many countries. This chapter provides an overview of the role of fiscal decentralisation for inclusive growth. Considering the large size of sub-national spending, the potential of fiscal decentralisation to enhance efficiency and equity is significant. But there are competing theories on the effect of fiscal decentralisation: according to normative public finance theory, fiscal equalisation has an important role to play for equity and efficiency. On the other hand, political economy theory suggests that reducing the vertical fiscal gap is good for government performance and economic growth. The empirical literature also shows mixed results. However, many empirical studies show that the interaction between fiscal decentralisation and institutions, the stage of economic development and political economy constraints exercise important roles in determining the success of fiscal decentralisation. Rather than rely on "one size fit all" prescriptions, policymakers should consider the importance of institutional complementarities to reap the full potential of fiscal decentralisation.

Introduction

In recent years, there has been an increased attention to the issues of inequality. The traditional economic thinking on inequality has been based on the concept of an efficiency-equity trade-off, which was proposed by Okun in his seminal book *Equality and Efficiency: The Big Tradeoff* (Okun, 1975). However, this paradigm has been recently challenged by leading scholars such as Stiglitz and Piketty. In discussing the relevance of the so-called Okun's law, Stiglitz (2016) stipulates that "one of the ways that our understanding of growth and development has changed is that we now see equality, growth, and stability as *complements*". The central theme of Piketty (2014) is that widening income and wealth inequality threatens the long-run prosperity and stability of the market economy. The new view on the relationship between inequality and economic prosperity is now widely shared by international organisations as well, as discussed by the World Bank (2009), IMF (Ostry, 2011, 2014), OECD (2011) and WEF (2015).

In recent years, the OECD has been particularly active in discussions on inclusive growth. According to the OECD, "We are at a critical crossroad. For years, we counted on economic growth as the only engine of prosperity, failing to realise that this model was leaving many behind" (OECD, 2017). With the recognition of the limitations of traditional thinking on economic growth and inequality, the OECD launched the Inclusive Growth Initiative in 2012. Obviously the scope of the discussion on inclusive growth is broad. OECD (2014a) defines Inclusive Growth as "economic growth that creates opportunity for all segments of the population and distributes the dividends of increased prosperity, both in monetary and non-monetary terms, fairly across society". Following this broad definition, the OECD has conducted extensive research on three key policy themes of inclusive growth: multidimensionality of inclusive growth, equal opportunity (regardless of gender, place of residence or ethnic origin), and policy relevance.[1]

Although there has been extensive research on inclusive growth, one key area that has not yet been dealt with in depth is the relationship between inclusive growth and fiscal decentralisation. The traditional literature on fiscal decentralisation has mainly focused on the efficiency benefits of fiscal decentralisation. The seminal paper by Tiebout (1956) demonstrates that the mobility of residents creates a market-type mechanism that induces an efficient provision of local public services by allowing residents to choose communities that best meet their demand for local public services. Oates's (1972) famous decentralisation theorem states that an efficient level of public services is provided at the lowest level of government because there is a better match between the preferences of residents and the provision of public services at this level.

While the traditional literature on local public finance focuses on the efficiency of public service provision, another strand of the literature has focused on the effects of fiscal decentralisation on economic growth. Starting from the pioneering studies of Zou (1996), Devarajan et al. (1996), and Davoodi and Zou (1998), there has been a vast empirical literature testing the effect of fiscal decentralisation on economic growth. However, the relationship between fiscal decentralisation and economic growth has not been found to be conclusive, according to recent surveys (see Baskaran et al., 2016 and Martinez-Vazquez et al., 2016). The empirical evidence on the relationship between fiscal decentralisation and economic growth is not clear-cut, because the success of fiscal decentralisation very much depends on the design of fiscal decentralisation, which is often influenced by politics and institutions as well as economic considerations. Therefore, as discussed in detail in this volume, the nature of fiscal decentralisation and

the interaction between fiscal decentralisation and institutions are crucial factors for the success of fiscal decentralisation.

Another important question regarding fiscal decentralisation is its effects on disparities across regions and communities. As discussed by, for example, Oates (2006) and Sellers et al. (2017), an implication of the Tiebout model is that the residential sorting that occurs as a result of the "voting with feet" mechanism results in fiscal disparities across communities. This means that the efficiency and equity trade-off may arise not only in the context of Okun's law, but also in the context of Tiebout's sorting mechanism. Even in the absence of the residential mobility that underlies the Tiebout model, disparities across communities and regions occur for many other reasons such as geographical advantages (historical agglomeration), natural resources or ethnic segregation. Since spatial disparities often give rise to as much economic and political tensions as disparities across individuals, discussions on how to lessen spatial disparities have a long tradition in the literature on fiscal decentralisation.

Although interregional and interpersonal disparities are closely related, there is an important theoretical difference between interregional and interpersonal redistribution as discussed in detail by Boadway (2001, 2004). Including the seminal works by Mirrlees (1971) and Okun (1975), the efficiency cost of interpersonal redistribution has been one of the key topics in the public economics literature, although Okun's law has recently been challenged by the argument for inclusive growth. On the other hand, there is a theoretical basis for the argument that interregional redistribution doesn't involve trade-offs between efficiency and equity. This is because the income segregation (spatial disparities of income) predicted by the Tiebout hypothesis does not in itself aggravate the individual income distribution. In other words, a more unequal distribution of income across geographical space, *ceteris paribus*, does not imply a more unequal distribution of income across individuals.[2] Therefore, while the reduction of interpersonal income inequality requires redistributive fiscal policies that involve progressive taxation and redistributive public expenditures, reduction of spatial inequality requires ensuring the equal treatment of equals regardless of the place of residence. The proposition that horizontal equalisation across localities enhances *both* equity and efficiency was put forward as early as the 1950s by the seminal papers of Buchanan (1950, 1952). Important later papers include Buchanan and Goetz (1972), Flatters, Henderson and Mieszkowski (1974), Boadway and Flatters (1982), and Albouy (2012).[3] A key insight from these studies is that a household's locational choice is affected not only by labour productivity but also by the fiscal capacity of sub-national governments. In the case when households choose their locations by taking into consideration not only wages and productivity but also the fiscal capacity of sub-national governments, migration between localities is not efficient in the sense that the total productivity of the economy is not maximized. Thus, if a household faces differences in the local tax burden or benefits from public services across localities, migration leads to inefficient resource allocation. Therefore fiscal equalisation that ensures the equal treatment of equals also eliminates differential net fiscal benefits so that both efficiency and equity are enhanced. As Boadway (2001) puts it, "there is no conflict between horizontal equity and efficiency either: in fact, the two are complementary". It is noteworthy that the literature on fiscal equalisation established a theoretical framework that shows the possibility of the complementarity between equity and efficiency long before the recent discussions on inclusive growth.

The theoretical argument related to differential net fiscal benefits and fiscal equalisation is interesting and important because it implies that, from the perspective of achieving both efficiency and inclusiveness (equity), a strong theoretical basis exists for

redistribution across localities. However, the extent to which fiscal incentives drive mobility across localities is an empirical question. Unfortunately, there are only a few empirical studies that estimate the magnitude of fiscally-induced migration (see Watson, 1986; Wilson, 2003; Day and Winer, 2006). Moreover, the results of these studies are mixed. Boadway (2001) notes that there are at least two reasons why the empirical evidence on fiscally-induced migration is not conclusive. Firstly, the empirical results depend on whether one takes a flow perspective (*e.g.*, one-year migration as in Watson (1988)) or a stock perspective (*e.g.*, multiple-year migration as in Wilson (2003)) in estimating the impact of fiscal equalisation on migration. Secondly, although the literature on fiscally-induced migration focuses on labour migration, differences of net fiscal benefits between localities have an impact not only on labour migration but also on business activities (Boadway, 2001). Therefore, the impact that differential net fiscal benefits have on the inefficiency of resource allocation across localities can be much larger when the economy as a whole rather than just the labour market is considered. Finally, although not explicitly discussed by Boadway (2001, 2004), the central government's location-specific investments are another type of fiscal incentives that influence the household's locational choice, especially in developing countries. For example, in many developing countries and even in some developed countries, "primate" city favouritism, discussed by Ades and Glaeser (1995), Kim (2011), and Duranton (2008, 2015), is a much more direct fiscal incentive that causes inefficient fiscally-induced migration of labour and capital.[4]

The discussion so far focused on the role of fiscal equalisation to prevent inefficient migration of persons and businesses. However, in the absence of mobility, the case for fiscal equalisation can be purely based on an equity rationale, as discussed in Boadway (2001, 2004). In many countries, the responsibilities of providing important redistributive expenditure such as education, health, and welfare are shared between the central and local governments. Therefore, the principle of horizontal equity implies that local governments should be able to provide a standard package of these redistributive expenditure at standard tax rates so that individuals can get access to a standard level of public services regardless of their residence. The fiscal equalisation system of the Nordic countries is a good example (see Kim and Lotz, 2008).

Seen from these perspectives, there is a strong inclusive growth rationale for the role of fiscal equalisation. However, the implementation of intergovernmental transfers in practice faces many challenges because of incentive problems. For example, intergovernmental transfers create an incentive for recipient local governments to manipulate local tax bases and spending needs in order to increase the amount of transfers they receive. Also, when local public services are largely provided by intergovernmental transfers rather than own-source revenue, the accountability of local governments is weakened because local residents do not pay attention to the fiscal management of local governments. So, although from the perspective of normative public finance theory ("first generation" fiscal federalism theory based on the hypothesis of benevolent government), fiscal equalisation can enhance both equity and efficiency, from the political economy viewpoint ("second generation" fiscal federalism theory that focuses on political economy constraints), it faces a trade-off between equity and efficiency.[5] As discussed by, for instance, Boadway (2004) and Blöchliger and Charbit (2008), and OECD/KIPF (2016: Chapter 4), there are ways to mitigate such incentive problems. However, due to the information asymmetry between central and local governments and political and institutional constraints, many countries have challenges in having a well-designed system of intergovernmental transfers.

In an empirical study on the effects of intergovernmental transfers or the "vertical fiscal gap", Sorens (2016) contrasts the above two divergent views on fiscal equalisation and calls the positive view the *public finance perspective* and the negative one the *political economy perspective*. Based on a meta-analysis of the econometric literature conducted on the effects of intergovernmental transfers, Sorens concludes that the results of empirical studies are more consistent with political economy perspective. In particular, he finds that, in federal democracies, vertical fiscal gaps lead to higher government debt and spending as well as undermine voter knowledge and public-sector efficiency.

The fact that empirical studies generally find negative effects of vertical fiscal gaps on economic and government performance suggests two policy options: improvement of the design of intergovernmental transfers or reduction of the vertical fiscal gap. As discussed by Alber and Valdescalici (2012), 'mature federations' with a strong federal political culture are less linked to the growth of power decentralisation. In those countries, the purpose of fiscal reform tends to be improving the coherence of the existing intergovernmental fiscal relations. The 2008 fiscal reform in Switzerland, which involved rearrangement of competences between the confederation and the cantons and the reorganization of the equalisation system is such an example. However, as discussed by Karpowicz (2012), in 'emerging federations' such as Spain, Italy and Belgium, the purpose of fiscal reform tends to be the reduction of vertical fiscal gaps.[6]

In the case when a country pushes for the reduction of vertical fiscal gaps by replacing intergovernmental transfers with an increase of local governments' own sources of revenues, horizontal equity might be sacrificed according to the traditional (normative) public finance theory (Boadway, 2001, 2004). However, as Sorens (2016) discusses, second generation fiscal federalism theory (the political economy perspective) advocated by Weingast (2009) predicts that the reduction of vertical fiscal gap enhances the accountability of local governments and mitigates the problem of soft budget constraints so that the productivity of the public sector increases. In addition, the reduction of intergovernmental transfers may create stronger incentives for workers in a low-wage region to migrate to a high-wage region. As the size of the labour force in the high-wage region increases, the level of wage in the high-wage region decreases and the opposite is true for the low-wage region. Also, firms have incentives to move to the location where the labour force and land are less expensive. Thus the convergence hypothesis put forward by Barro and Sala-i-Martin (1991, 1992) implies that the reduction of vertical fiscal gaps does not necessarily widen spatial disparities.

Given that different theories predict different effects of fiscal decentralisation, whether and how fiscal decentralisation affects growth and inclusiveness is an empirical question. As discussed in detail by Baskaran et al. (2016), Martinez-Vazquez et al. (2016) and Sorens (2016), the results of empirical studies on the effects of fiscal decentralisation on economic growth, government performance, regional convergence, and regional disparities vary significantly. However, a key insight from these empirical studies is that institutional complementarities matter. In an empirical study on the effect of fiscal decentralisation on economic growth based on a sample of OECD countries, Filippetti and Sacchi (2014) find that fiscal decentralisation has a positive effect on economic growth when tax decentralisation is coupled with administrative and political decentralisation. On the other hand, Enikolopov and Zhuravskaya (2007) find that political centralisation significantly improves outcomes of fiscal decentralisation such as economic growth, quality of government, and public goods provision in an empirical study based on developing and transition countries. In a study on the effect of fiscal decentralisation on regional disparities, Rodríguez-Pose and Ezcurra (2010) and

Lessmann (2012) find that fiscal decentralisation tends to reduce regional disparities in developed countries, but increases disparities in developing countries. In a study on the interaction between fiscal decentralisation and governance quality, Kyriacou et al. (2015) find that fiscal decentralisation promotes regional convergence in countries with high government quality but leads to wider regional disparities in countries with poor governance.

The relationship between fiscal decentralisation and institutional complementarities implies that, for the success of fiscal decentralisation, its design needs to be evaluated from a broad perspective of the political and economic institutions and the development stage of a country. In this regard, Bardhan (2002) notes that the implications from the classical literature on fiscal decentralisation such as Tiebout (1956) do not apply to developing countries because of several factors such as lack of mobility especially among poor people, weak institutions of local democracy and lack of political accountability, importance of poverty alleviation by targeted programmes, a built-in tendency toward vertical fiscal imbalances, and the lower quality of staff in local bureaucracies. The relationship between different dimensions of decentralisation in developing countries investigated by Enikolopov and Zhuravskaya (2007) is a particularly important issue. Blanchard and Shleifer (2001) argued that China's economic success was achieved by fiscal decentralisation combined with – unlike Russia – political centralisation. Bardhan (2016) describes the economic success of China as a "unique hybrid institutional case" and notes that this balance has been difficult to achieve in other countries. What is noteworthy in the case of China is that it significantly increased rather than decreased the vertical fiscal gap in the 1994 fiscal reform. This might need to be changed in the future, but the experience of China which has the record of sustained economic growth for more than forty years illustrates the complex nature of institutional complementarities related to fiscal decentralisation.

In sum, seen from a broad perspective, whether or not fiscal decentralisation promotes inclusive growth is a moot question. In many OECD countries, sub-national governments collect a large amount of tax revenue and assume the responsibility of providing essential public services such as health, education, and welfare. Even in countries where the size of local government revenue is relatively small (such as the United Kingdom and the Netherlands), the size of local spending is much larger due to intergovernmental transfers. As documented by Boadway and Shah (2009), local governments in developing countries also play an important role in providing infrastructure, education, health and social services. Therefore, given the potential of fiscal decentralisation to improve both efficiency and equity, the success of fiscal decentralisation is one of the keys to inclusive growth of any country. The challenge lies in understanding the complex and country-specific nature of fiscal decentralisation.

The chapters in this volume address fiscal decentralisation and inclusive growth from several different angles: two chapters (Blöchliger and Akgun, Dougherty and Akgun) investigate the effects of fiscal decentralisation on economic growth; three chapters (Vermuelen, Kim, and Sow and Razafimahefa) on education and public service delivery (infant mortality rates and school enrolment rates); and three chapters address country cases (Rao on India, Smith et al. on England, and Eijkel and Vermeulen on the Netherlands) related to reforming intergovernmental fiscal relations. The wide range of issues covered in this volume demonstrates the diverse nature of fiscal decentralisation. The chapters also show that institutions, economic development stages, and political economy constraints are key elements of fiscal decentralisation.

Notes

1. See, for example, OECD (2011), OECD (2012), OECD (2014a), OECD (2014b), and OECD (2017).
2. This is under the assumption that income segregation does not involve political and ethnic tensions. Spatial inequality may reinforce interpersonal inequality when political and ethnic discrimination are at play (Kanbur and Venables, 2005; Ezcurra and Rodríguez-Pose, 2017).
3. See Boadway (2001, 2004) for detailed discussions.
4. "Primate city favouritism harms the favoured primate city by making it larger than it should be. It also harms smaller cities, which are, in effect, heavily taxed" (Duranton, 2015: 63).
5. For a review on the evolution of the theory of fiscal federalism, see Oates (2005, 2008).
6. It should be noted that China took a different route. The fiscal reform in 1994 drastically increased vertical fiscal gap (see, e.g., Shen and Zou, 2012).

References

Ades, A. and E. Glaeser (1995), "Trade and Circuses: Explaining Urban Giants", *The Quarterly Journal of Economics*, 110(1), 195-227.

Alber, E. and A. Valdescalici (2012), "Reforming Fiscal Federalism in Europe: Where Does the Pendulum Swing?", *L'Europe en Formation* 2012/1 (n° 363), 325-365.

Albouy, D. (2012), "Evaluating the Efficiency and Equity of Federal Fiscal Equalization", *Journal of Public Economics*, 96(9–10), 824-839.

Bardhan, P. (2002), "Decentralisation of Governance and Development", *Journal of Economic Perspectives*, 16(4), 185-205.

Bardhan, P. (2016), "State and Development: The Need for a Reappraisal of the Current Literature", *Journal of Economic Literature*, 54(3), 862–892.

Barro, R. and Sala-i-Martin, X. (1991), "Convergence across States and Regions", *Brookings Papers on Economic Activity*, 1, 107–182.

Barro, R. and Sala-i-Martin, X. (1992), "Convergence", *Journal of Political Economy*, 100: 407–443.

Baskaran, T., L.P. Feld and J. Schnellenbach (2016), "Fiscal Federalism, Decentralisation and Economic Growth: Survey and Meta-Analysis", *Economic Inquiry*, 54(3), 1445–1463.

Blanchard, O. and A. Shleifer (2001), "Federalism With and Without Political Centralization: China Versus Russia", *IMF Staff Papers*, 48, 171–179.

Blöchliger, H. and C. Charbit (2008), "Fiscal Equalisation", *OECD Economic Studies*, 44(1), 1–22.

Boadway, R. and A. Shah (2009), *Fiscal Federalism: Principles and Practice of Multiorder Governance*, New York: Cambridge University Press.

Boadway, R. and F. Flatters (1982), "Efficiency and Equalization Payments in a Federal System of Government: A Synthesis and Extension of Recent Results", *Canadian Journal of Economics*, 15, 613-633.

Boadway, R. (2004), "The Theory and Practice of Equalization", *CESifo Economic Studies* 50, 211-254.

Boadway, R. (2001), "Financing Confederation Revisited: The Economic State of the Federation", in P. Grady and A. Sharpe (eds.), *The State of Economics in Canada: Festschrift in Honor of David Slater*, Kingston: John Deutsch Institute for the Study of Economic Policy, 37-56.

Buchanan, J. and C. Goetz (1972), "Efficiency Limits of Fiscal Mobility: An Assessment of the Tiebout Model", *Journal of Public Economics*, 1, 25-43.

Buchanan, J. (1950), "Federalism and Fiscal Equity", *American Economic Review*, 40, 583-599.

Buchanan, J. (1952), "Central Grants and Resource Allocation", *Journal of Political Economy*, 60, 208-217.

Davoodi, H. and Zou, H. (1998), "Fiscal Decentralisation and Economic Growth: A Cross-country Study", *Journal of Urban Economics*, 43, 244-257.

Day, K. and S. Winer (2006), "Policy-induced Internal Migration: An Empirical Investigation of the Canadian Case", *International Tax and Public Finance*, 13(5), 535-564.

Devarajan, S., V. Swaroop, and H. Zou (1996), "The Composition of Public Expenditures and Economic Growth", *Journal of Monetary Economics*, 37, 313-344.

Duranton, G. (2015), "Growing through Cities in Developing Countries", *The World Bank Research Observer*, 30(1), 39-73.

Duranton, G. (2008), "Viewpoint: From Cities to Productivity and Growth in Developing Countries", *Canadian Journal of Economics*, 41(3): 689–736.

Enikolopov, R. and E. Zhuravskaya (2007), "Decentralisation and Political Institutions", *Journal of Public Economics*, 91(11-12), 2261-2290.

Ezcurra, R. and A. Rodríguez-Pose (2017), "Does Ethnic Segregation Matter for Spatial Inequality?", *Journal of Economic Geography*, 17(6), 1149–1178.

Filippetti, A. and A. Sacchi (2016), "Decentralisation and Economic Growth Reconsidered: The Role of Regional Authority". *Environment and Planning C: Politics and Space*, 34(8), 1793-1824.

Flatters, F., V. Henderson and P. Mieszkowski (1974), "Public Goods, Efficiency, and Regional Fiscal Equalisation", *Journal of Public Economics*, 3, 99–112.

Kanbur, R, and A. Venables (2005), *Spatial Inequality and Development*, Oxford: Oxford University Press.

Karpowicz, I. (2012), "Narrowing Vertical Fiscal Imbalances in Four European Countries", *IMF Working Papers*, IMF, Washington, D.C.

Kim, J. and J. Lotz (2008), *Measuring Expenditure Needs – The Copenhagen Workshop 2007*. The Korea Institute of Public Finance and the Danish Ministry of Social Welfare.

Kim, J. (2011), "Non-market Effects on Agglomeration and their Policy Responses: Can We Overcome the Mismatch?", *OECD Regional Outlook 2011*, pp. 195-201.

Kyriacou, A.P., L. Muinelo-Gallo, and O. Roca-Sagalés (2015), "Fiscal Decentralization and Regional Disparities: The Importance of Good Governance", *Papers in Regional Science*, 94(1), 89-108.

Lessmann, C. (2012), "Regional Inequality and Decentralization: An Empirical Analysis", *Environment and Planning A*, 44, 1363–1388.

Martinez-Vazquez, J., S. Lago-Peñas, and A. Sacchi (2017), "The Impact of Fiscal Decentralization: A Survey", *Journal of Economic Surveys*, 31(4), 1095-1129.

Mirrlees, J. (1971), "An Exploration in the Theory of Optimal Income Taxation", *Review of Economic Studies*, 38, 175-208.

Oates, W. (2005), "Toward a Second-Generation Theory of Fiscal Federalism", *International Tax and Public Finance*, 12, 349-373.

Oates, W. (2006), "The Many Faces of the Tiebout Model", in W.A. Fischel (ed.), *The Tiebout Model at Fifty*, Cambridge, MA: Lincoln Institute of Land Policy, pp. 21-45.

Oates, W. (1972), *Fiscal Federalism*, New York: Harcourt Brace Jovanovich.

Oates, W. (2008), *On the Evolution of Fiscal Federalism: Theory and Institutions*, *National Tax Journal*, 61, 313-334.

OECD (2011), *Divided We Stand: Why Inequality Keeps Rising*, OECD Publishing, Paris.

OECD (2012), "New Approaches to Bring All on Board!", *OECD Observer*, No. 290-291, OECD Publishing, Paris.

OECD (2014a), *All on Board: Making Inclusive Growth Happen*, OECD Publishing, Paris.

OECD (2014b), "Inclusive Growth", Meeting of The OECD Council at Ministerial Level, Paris 6-7 May. OECD Publishing, Paris.

OECD (2017), "Time to Act: Making Inclusive Growth Happen", *OECD Policy Briefs*, OECD Publishing, Paris.

OECD/KIPF (2016), *Fiscal Federalism 2016: Making Decentralisation Work*, OECD Publishing, Paris.

Okun, A. (1975), *Equality and Efficiency: The Big Tradeoff*, Washington, DC: Brookings Institution.

Ostry, J.D., A. Berg, and C.G. Tsangarides (2014), "Redistribution, Inequality, and Growth", *IMF Staff Discussion Notes*, No. 14/2.

Ostry, J.D. and A. Berg (2011), "Inequality and Unsustainable Growth; Two Sides of the Same Coin?", *IMF Staff Discussion Notes*, No. 11/08.

Piketty, T. (2014), *Capital in the Twenty-first Century*, Harvard University Press, Cambridge, MA.

Rodriguez-Pose, A. and R. Ezcurra (2010), "Does Decentralisation Matter for Regional Disparities? A Cross-country Analysis", *Journal of Economic Geography*, 10(5), 619-644.

Sellers, J., M. Arretche, D. Kübler, and E. Razin (eds.) (2017), *Inequality and Governance in the Metropolis: Place Equality Regimes and Fiscal Choices in Eleven Countries*, Basingstoke: Palgrave Macmillan.

Shen, C. and H. Zou (2012), "Fiscal Decentralisation in China: History, Impact, Challenges and Next Steps", *Annals of Economics and Finance*, 13(1), 1-51.

Sorens, J. (2016), "Vertical Fiscal Gaps and Economic Performance: A Theoretical Review and Empirical Meta-Analysis", *Mercatus Working Papers*, February.

Stiglitz, J.E. (2016), *The State, the Market, and Development*. 2016/1. Helsinki: UNU-WIDER.

Tiebout, C. (1956), "A Pure Theory of Local Expenditures", *Journal of Political Economy*, 64, 416-424.

Watson, W. (1986), "An Estimate of the Welfare Gain from Fiscal Equalization", *Canadian Journal of Economics*, 19, 298-308.

Weingast, B. (2009), "Second Generation Fiscal Federalism: The Implications of Fiscal Incentives", *Journal of Urban Economics*, 65(3), 279–93.

Wilson, L. (2003), "Equalization, Efficiency and Migration: Watson Revisited", *Canadian Public Policy*, 29(4), 385-395.

World Bank (2009), *What is Inclusive Growth?*, World Bank, Washington, DC.

World Economic Forum (WEF) (2015), *The Inclusive Growth and Development Report 2015*.

Zou, H. (1996), "Taxes, Federal Grants, Local Public Spending, and Growth", *Journal of Urban Economics*, 39, 303–317.

Chapter 2

Fiscal decentralisation and economic growth

by
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This chapter deals with the relationship between fiscal decentralisation and economic growth. Using a novel empirical approach, the analysis suggests that decentralisation tends to be supportive of economic growth. Decentralisation of tax revenues tends to have a stronger impact than spending decentralisation, especially when government is small. Intergovernmental transfers, covering a large part of sub-central spending in most countries, are associated with slower growth, which could point at common-pool problems and a lack of incentives for own-source development. Balanced decentralisation – i.e. when the various policy functions are decentralised to a similar extent – is conducive to growth. Balanced decentralisation allows sub-national governments to better co-ordinate policy and to reap economies of scale and scope across functions. While public investment tends to have a positive growth effect overall, its decentralisation is negatively associated with growth.

Introduction and main findings

Sub-national governments are responsible for around 33% of OECD government spending and collect 19% of tax revenues, with considerable scope to affect their country's fiscal and economic outcomes. Sub-national policies are one determinant of how households and firms save, invest, spend, innovate and pay taxes; and, by encouraging productivity in the public sector, sub-national governments help increase the productivity of businesses. Competitive pressure and policy benchmarking drive jurisdictions to factor in the demands and preferences of households and firms. As such, sub-central fiscal autonomy and intergovernmental fiscal frameworks shape fiscal outcomes and finally also affect growth.

This chapter shows empirically that the design of fiscal decentralisation matters for growth. The chapter is organised as follows: the next section provides a short overview of decentralisation trends over the last two decades and a literature review portraying the channels linking decentralisation to growth; the third section presents the growth model and the data for the empirical investigation; and the last section shows the results, divided into a sub-section on overall decentralisation measures and one on decentralisation of individual spending items. Finally, the role of decentralisation for inclusive growth will be shortly assessed, in particular, whether decentralisation creates synergies or trade-offs between growth and inequality.

The chapter relies partly on a newly constructed dataset on public spending and taxation across OECD countries, which combines various existing data sources in a consistent manner (Bloch et al., 2016). Given that data availability varies – in particular, the time series for the tax side is longer than for the spending side – different specifications are used for estimating the effects of tax and spending decentralisation.

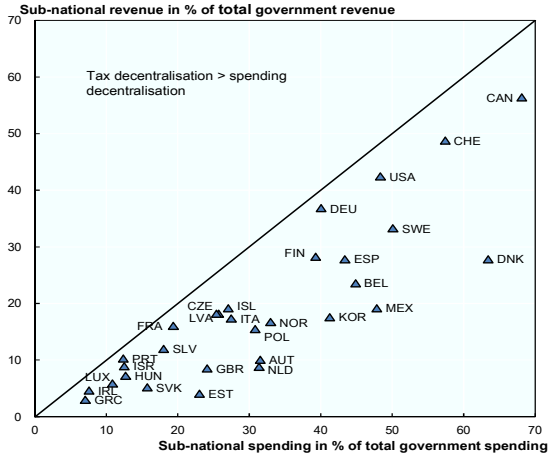
Decentralisation and economic performance

A bird's-eye view of fiscal decentralisation

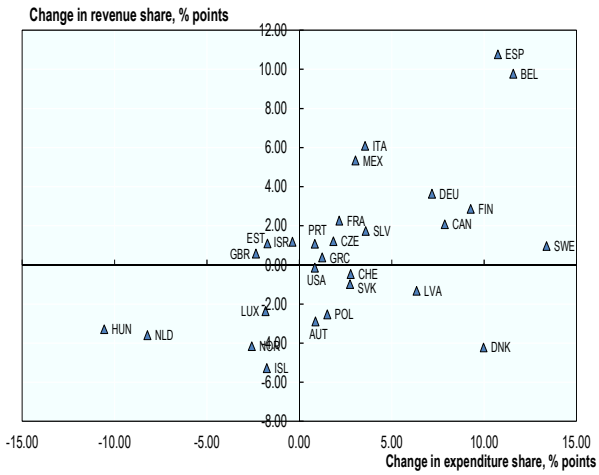
Fiscal decentralisation – the role of sub-national government in overall public finance – varies strongly across countries, but has changed relatively little over time. A commonly used indicator measuring decentralisation is the sub-central revenue or spending share. OECD-wide, in 2014, sub-central governments (SCGs) were responsible for around 33% of general government spending on an unweighted average, while the sub-central share of own revenue – own taxes, user fees and property income – averaged 19% (Figure 2.1, Panel A). Both the sub-central share of spending and revenue increased a bit since 1995 (Figure 2.1, Panel B). The difference between sub-central spending and own revenue – the vertical fiscal imbalance –hovered between 14% and 16% of general government spending over the last two decades. Decentralisation reforms that have profoundly changed intergovernmental fiscal frameworks were rare and confined to a few countries on a secular decentralisation path (OECD/KIPF, 2016).

Figure 2.1. **Revenue and spending assignment vary widely across countries**

A. Decentralisation ratios, 2016 or latest available year



B. Decentralisation ratios, 1995-2016 or latest

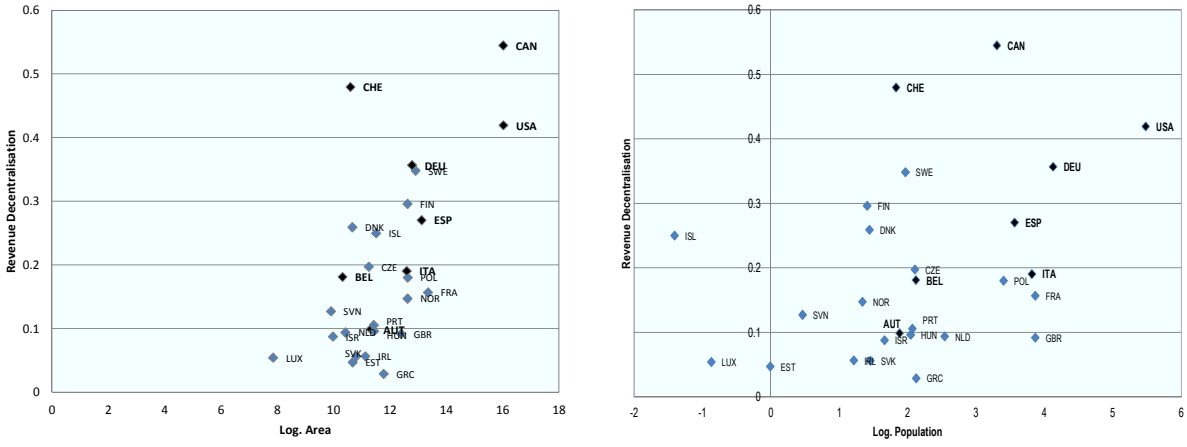


Note: Sub-national spending includes intergovernmental grants, while sub-national revenues do not.

Source: OECD Fiscal Network database, http://oe.cd/fiscalnetwork.

Decentralisation owes much to country size. Larger countries are more decentralised than smaller ones, with a few outliers confirming the rule: Denmark and Switzerland are small and highly decentralised, while France is large and quite centralised (Figure 2.2). The relationship is independent of whether decentralisation is measured by the sub-central revenue or spending share, or whether area or population is the gauge for size. Geography plays a role, suggesting that some benefits of decentralised policy making – taking better account of heterogeneous preferences, lower information and co-ordination cost, fewer diseconomies of scale and scope – are related to space and distance. As such, reforms to intergovernmental fiscal frameworks often have a spatial or territorial component as seen when jurisdictions merge or when an intermediate (regional) government layer is created or abolished.

Figure 2.2. **Larger countries are more decentralised than smaller ones**
Area, population, and the share of sub-central in general government revenue, 2014



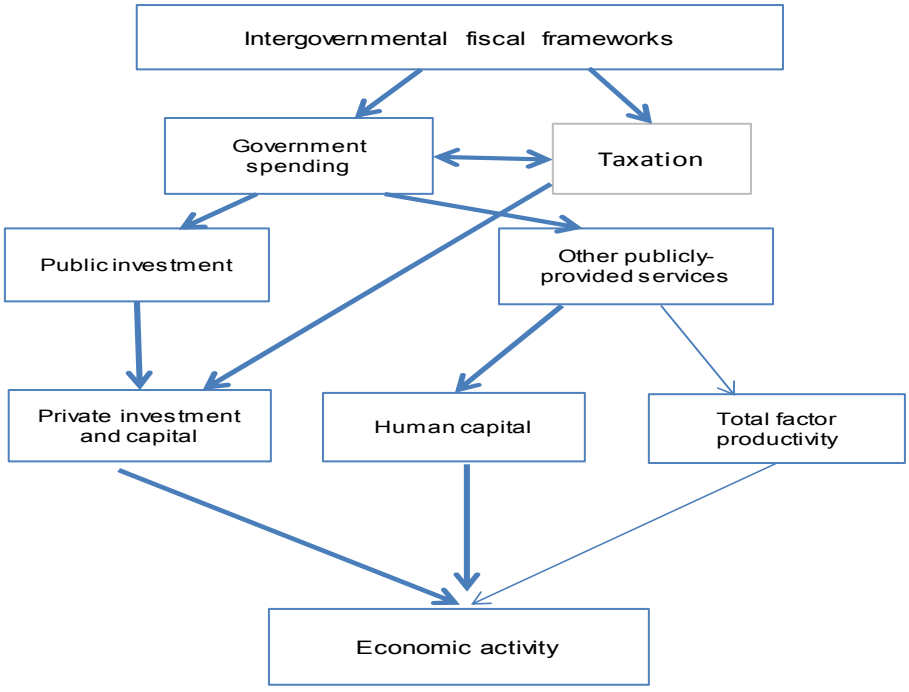
Note: Federal countries are shown in black.

Source: OECD Economic Outlook and OECD Regional Database.

Channels from decentralisation to growth

The link from decentralisation to economic outcomes can be portrayed by a macroeconomic production function, where output is determined by physical and human capital and the productivity of these factors. Productivity, in turn, is affected by institutions and policy design, including fiscal frameworks. The productivity of firms and the well-being of households depend on the taxes sub-national governments levy and the money they spend on the various policy functions. More specifically, private investment may rely on investment by the public sector, and the taxes levied. Finally, decentralisation in specific sectors such as education or healthcare may directly affect their effectiveness, which in turn may affect human capital formation or productivity. Channels, shown as *thick arrows*, will be analysed in more detail in this chapter (Figure 2.3).

Figure 2.3. **Channels from decentralisation to economic activity**



Note: Channels, shown by thick arrows, are analysed in more detail in this chapter.

Source: Authors' elaboration.

The effect of intergovernmental fiscal frameworks on economic performance works through several channels. Decentralisation can have both a positive or negative long-term impact on growth, so the overall effect is indeterminate on theoretical grounds, as discussed below.

Decentralisation can be conducive to growth

- **Inter-jurisdictional competition and public sector efficiency**: The growth-promoting channel most often cited is inter-jurisdictional competition for mobile production factors (Tiebout, 1956). The interaction between locational choices of households and firms and the policy choices of sub-national governments are thought to make for a more productive public sector, which in turn would promote productivity in the private sector. Also, peripheral jurisdictions may lift their growth prospects by competing against the gravitational pull of agglomerations (Baldwin and Krugman, 2004).

- **Political economy and the preservation of markets**: This channel relates to the political economy of intergovernmental fiscal frameworks. Decentralisation may restrain the power of special interests and reduce spending on non-productive items such as on subsidies (Besley and Coate, 2003). Decentralisation may also help reduce regulation and preserve open markets (Weingast, 1995). Finally, decentralisation may encourage policy innovation and yardstick competition, improving the productivity of the sub-central public sector and hence foster private investment (Besley and Case, 1995).

Decentralisation can be harmful to growth

- **Economies of scale and scope**: The lack of size may increase the cost of public services (Spolaore, 2015). A typical case in point is infrastructure and network industries whose cost decreases with growing size and where insufficient scale and/or the lack of co-ordination between jurisdictions or across government levels may fail to take account of network externalities and diminish the impact of infrastructure investment.

- **Spending and tax externalities**: The individual policy choices of jurisdictions may harm growth prospects of others or those of the entire country. Externalities may induce an undersupply of public goods and especially of public investment and infrastructure (Zodrow and Mieszkowski, 1986). It may also distort the tax structure and lead to excessively low sub-national tax rates (Wildasin, 1989). Such tax externalities could hamper growth.

Empirical investigations linking decentralisation and growth have provided mixed results so far. A meta-analysis of around 30 studies concludes that there is no strong support for either a positive or negative effect of intergovernmental fiscal frameworks on growth (Baskaran et al., 2016). Single-country studies provide more significant – and positive – results than cross-country studies, likely because the institutional and policy environment can be better controlled for in an individual country study. Revenue decentralisation tends to be associated with more positive results than spending decentralisation (Asatryan and Feld, 2014). An earlier study by the OECD Fiscal Network finds that decentralisation has a positive but economically weak effect on productivity (Blöchliger et al., 2013). Finally, some recent research finds that decentralisation is associated with less income inequality (Stossberg and Blöchliger, 2017).

Finally, the overall results suggest that the effect of decentralisation on growth depends on the broader policy environment and the quality of the institutional framework

within which sub-national governments operate (Enikopolov and Zhuravskaya, 2007). In general, the link from decentralisation to growth seems to be more robust for developed countries than for emerging economies (Martinez-Vazquez and McNab, 2006), suggesting that institutional quality plays a role. However, adding indicators of government effectiveness tends to reduce rather than improve significance in several studies that use them as controls, probably because decentralisation is closely associated with government quality (Baskaran, Feld and Schnellenbach, 2016).

Empirical set-up and data

Model and specifications

The empirical approach builds on the neo-classical growth theory. In a human capital augmented Solow model, in the steady state, the logarithm of gross domestic product (GDP) per capita depends linearly on the logarithm of the stock of human capital and the logarithm of the investment rate (Mankiw, Romer and Weil, 1992). This long-term relationship is embedded in a convergence growth equation where the potential growth rate of GDP per capita depends on the past potential GDP per capita level, production factors and a set of structural variables influencing growth. The sample is restricted to OECD countries because these countries provide better data on decentralisation.[1] The convergence growth equation is augmented by the size of government and the decentralisation variables and embedded in an error-correction model, following Barro (2015):

$$\begin{aligned}\Delta \ln(Y_{i,t}/POP_{i,t}) = \quad & a-\phi\,[\ln(Y_{i,t-1}/POP_{i,t-1})-a_1\ln(schooling_{i,t-1}*PISA_{i,t-1})-a_2\ln(I_{i,t-1}/Y_{i,t-1})-\ldots \\ & .a_3X_{i,t-1}-a_4G_{i,t-1}-a_5D_{i,t-1}]+b_1\Delta\ln(schooling_{it}*PISA_{i,t})+b_2\Delta\ln(I_{i,t}/Y_{i,t})+v_t+c_i+\varepsilon_{i,t}\end{aligned} \quad (1)$$

where i indicates the country, t is time, Y is potential GDP in 2010 purchasing power parity, POP is the working-age population (age 15 to 74), schooling is the average years of schooling of the working age population, PISA is the mean PISA (Programme for International Student Assessment) score in 2006, I/Y is the cyclically-adjusted total investment rate[2] and X is a set of control variables including openness (measured as the sum of exports and imports to GDP), rule of law, employment protection legislation, inflation (measured by consumer price inflation), population size, old-age dependency ratio and financial development (proxied by the credit to GDP ratio). G is the size of government (cyclically-adjusted primary spending or revenue to potential GDP), and D are the sub-central spending or revenue variables, measured in terms of GDP or general government spending/revenue. v_t is a time fixed effect and c_i a country fixed effect. The standard errors are adjusted for country clusters to allow for serial correlation of the residuals. In this set-up, a decentralisation reform affects GDP growth in the short run and GDP levels in the long run. Since it can take decades to reach the new long-run GDP level after a reform, the temporary growth effect lasts for a long time.

The model is run both with and without country-fixed effects. The specification without country-fixed effects helps to capture the impact of fundamental cross-country differences in intergovernmental fiscal frameworks on growth. As mentioned above, most decentralisation ratios change slowly over time, while cross-country heterogeneity is much more significant (Table 2.1 and Figure 2.1). For instance, the estimated decentralisation coefficient in the growth equation may capture critical structural differences in the design of decentralisation across countries such as a persistently high (e.g. Denmark) or low (e.g. Greece) share of sub-central in overall spending or taxation.

As the specification without country-fixed effects exploits both the cross- *and* within-country variability, the standard errors of the coefficient estimates are smaller.

Table 2.1. **Most variation in decentralisation ratios is across countries**

	Share of between variance in total variance (in %)	
	Share of general government expenditure or revenue in GDP	Share of sub-central expenditure or revenue in GDP
Spending	84.0	95.2
Revenue	88.9	97.9
Tax revenue	92.1	92.0
Grants	--	90.9
Education	88.5	95.9
Health	84.3	89.2
Social protection	93.7	98.9
Investment	54.8	69.5
Wage	92.9	96.4
Subsidies	71.9	96.8

Source: Authors' calculations.

Data and measurement

The decentralisation data are taken from the *OECD Fiscal Decentralisation Database*. To account for differences in decentralisation design, altogether four different indicators are selected to enter *alternatively* into otherwise identical equations: spending decentralisation; revenue decentralisation; tax decentralisation; and intergovernmental transfers (OECD/KIPF, 2013). While revenue and tax revenue decentralisation are similar in highly decentralised countries, they tend to differ in fiscally centralised countries where sub-national governments rely on user fees rather than tax revenues. Spending, revenue and tax decentralisation indicators are available for the period 1970 to 2011 for a few OECD countries; for the period 1985 to 2014 for around half of the countries; and for the period 1995 to 2014 for most countries.

The control variables stem from various databases. Most macroeconomic variables are taken from the *OECD Economic Outlook November 2015 database*. The quality of education is measured as the average of reading, science and math PISA scores in 2006.[3] Average years of schooling of the working-age population are from the *OECD Long-term Economic Outlook database*. The rule of law indicator stems from the *Worldwide Governance Indicator (WGI) database* of the World Bank. Employment protection legislation (EPL) is the protection for regular contracts based on the second edition of this OECD indicator. For these two slow-moving indicators, the average value over the available years is used in the regressions.[4] The credit to GDP ratio is from the *World Bank Global Financial Development database*, with some adjustments made, as in Cournède and Denk (2015). Individual spending items by function (education, healthcare, etc.) and transactions (wages, investment, subsidies, etc.) are taken from Bloch et al. (2016) (see Annex Table 2.A1.1). The tax composition is taken from the *OECD Revenue Statistics*.

Certain decentralisation indicators are sensitive to the business cycle.[5] To obtain a measure of decentralisation net of cyclical movements, the various decentralisation shares are cyclically adjusted following the methodology of Price, Dang and Botev (2015).

GDP is measured as potential GDP, and the size of government is expressed as cyclically adjusted primary spending to potential GDP. The use of cyclically adjusted variables is novel as research on decentralisation and growth has used non-adjusted variables so far (Baskaran, Feld and Schnellenbach, 2016). The final baseline sample for the growth regressions covers 797 country-year observations from 1987 to 2014, where the main restriction for the coverage of the sample is the availability of cyclically adjusted data. When the decentralisation variables are inserted, the sample size shrinks to between 400 and 550 observations. Descriptive statistics are provided in Annex Table 2.A1.1.

Results

Baseline results

The baseline regressions cover the production function incorporating physical and human capital and the control variables but without the fiscal decentralisation variables (Table 2.2). The regression is run on three panels: a parsimonious one, featuring investment and human capital only; a rich one, featuring many control variables; and an intermediate one excluding some controls. Each panel is run using both time-fixed effects and time- and country-fixed effects. Human capital is measured by PISA results rather than education spending as this reflects the quality of education. The regressions were also run with years of schooling and interacting PISA results with years of schooling, with results becoming a bit weaker.

Table 2.2. **Growth regression: Baseline results**

	(1)	(2)	(3)	(4)	(5)	(6)
Long term						
$\ln(Y_{it-1}/POP_{it-1})$	-0.024***	-0.041***	-0.020***	-0.039***	-0.026***	-0.039***
	(0.0042)	(0.0085)	(0.0065)	(0.013)	(0.0062)	(0.0093)
$\ln(PISA_i * schooling_{it-1})$	0.020**	-0.015	0.0029	-0.021	0.012	-0.019
	(0.0080)	(0.021)	(0.0093)	(0.023)	(0.0082)	(0.017)
$\ln(I_{it-1}/Y_{it-1})$	0.014*	-0.0013	0.023***	0.012	0.017***	0.0094
	(0.0071)	(0.0097)	(0.0058)	(0.0095)	(0.0058)	(0.0088)
Short term						
$\Delta\ln(PISA_i * schooling_{it})$	0.27	0.33*	0.25	0.27	0.39	0.30
	(0.29)	(0.18)	(0.29)	(0.29)	(0.32)	(0.27)
$\Delta\ln(I_{it}/Y_{it})$	0.019***	0.0073	0.0069	0.0021	0.0097*	0.0018
	(0.0062)	(0.0047)	(0.0052)	(0.0057)	(0.0056)	(0.0049)
Additional variables						
ln(population size)$_{it-1}$	-0.0014	0.035*	0.00094	0.034*	0.0010	0.031*
	(0.00095)	(0.019)	(0.00086)	(0.018)	(0.0011)	(0.016)
Average rule of law$_i$			0.0069**		0.0074**	
			(0.0031)		(0.0032)	
Average employment protection$_i$			-0.0032			
			(0.0031)			
Openness$_{it-1}$			0.011**	0.012*	0.010**	0.0099
			(0.0042)	(0.0064)	(0.0047)	(0.0063)
Inflation$_{it-1}$			-0.026**	-0.030***	-0.020***	-0.031***
			(0.010)	(0.0079)	(0.0074)	(0.0073)
Credit ratio$_{it-1}$			-0.0052**	-0.0068	-0.0038	-0.0070
			(0.0023)	(0.0054)	(0.0025)	(0.0049)
Old-age dependency ratio$_{it-1}$			-0.013	0.00086		
			(0.030)	(0.047)		

Table 2.2. Growth regression: Baseline results *cont.*

	(1)	(2)	(3)	(4)	(5)	(6)
Observations	797	797	592	592	627	627
R-squared	0.563	0.606	0.662	0.672	0.645	0.674
Country-fixed effects	No	Yes	No	Yes	No	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: Asterisks (*, **, ***) indicate the significance level (10%, 5%, 1%) of the coefficients. The standard errors are adjusted for country clusters. The long-run steady state coefficients can be calculated based on these short-run coefficients as ratios of the short-term coefficient to the negative of the convergence coefficient Φ.

Source: Authors' calculations.

Table 2.2 presents the baseline regression with significant and positive effects of the production factors on growth and plausible convergence rates. The effect of education is more significant in the parsimonious specifications than in those with many control variables, suggesting that some control variables indirectly capture the effect of education. Indeed, some controls such as the rule of law or openness might be affected by better education. As such, better education lifts growth both directly and indirectly, the latter by improving the quality of institutions. According to the "iron law of convergence", countries are expected to converge to the productivity frontier at a 2% rate per year (Barro, 2015), which is roughly the rate estimated here. The estimation suggests that it takes about 30 years to close half of the initial GDP per capita gap.

Different sets of control variables are used to investigate the robustness of the production function effect. The specifications in Table 2.2 include three different sets of control variables that are unlikely to be directly affected by investment and education. Most controls have the expected sign and are significant, except the credit ratio, where the effect is negative and significant. Overall, the most parsimonious regression tends to provide more significant results for investment and education, again suggesting some interaction between the production factors and the controls. Finally, the results are mostly unchanged when the sample is restricted to the pre-crisis years.

The effect of spending and revenue decentralisation on growth

The empirical results with the decentralisation variables inserted suggest that the design of fiscal decentralisation matters for growth (Table 2.3). Columns 1-6 present the findings with time-fixed effects and columns 7 to 12 with both time- and country-fixed effects. Columns 2 and 8 report the results of a simultaneous estimation of spending decentralisation and of the size of the system of intergovernmental transfers. All regressions control for the overall size of government as measured by the public spending-to-GDP ratio. Using the share of sub-national spending or revenue in general government rather than in GDP does not change the result, although they become a bit less significant. All regressions include a large set of control variables to avoid omitted variable bias, and most of them enter significantly and with the expected sign.[6]

The overall estimation results suggest that tax decentralisation is more conducive to growth than spending decentralisation. In the country-fixed effects specification, increasing tax decentralisation by 10 percentage points is associated with around 0.09 percentage points more growth or, in the long run, with around 1.75% higher GDP per capita. The insignificant effect of revenue decentralisation could be explained by its composition as sub-national tax revenues are often a substitute for other sub-national

resources such as user fees or property income. The constitutional set-up also matters: in federal countries the negative effect of spending decentralisation is significant, while tax decentralisation exerts its (positive) significant effect in unitary countries only (Table 2.4). These results suggest that unitary countries would gain most from tax decentralisation, while federal countries might have to address the sub-national spending side more seriously.

Intergovernmental transfers could explain the weak or sometimes negative association between spending decentralisation and growth. Transfers tend to diminish spending financed by own-source revenue and discourage the development of the economic and fiscal base. As such, spending decentralisation could be subject to two countervailing forces: while spending covered by own sources is growth-enhancing, transfers and transfer-funded spending are growth-dampening. Recent empirical research also found opposite effects for spending and tax revenue decentralisation with the role of intergovernmental transfers (Bartolini, Stossberg and Blöchliger, 2016; Baskaran, Feld and Schnellenbach, 2016), Using the vertical fiscal imbalance – the difference between spending and revenue decentralisation – rather than intergovernmental transfers delivers similar results.[7] Overall, transfers may slow down overall GDP growth. Some recent research also suggests that while transfers reduce differences in regional *income* levels, they might be responsible for growing differences in *GDP* (Bartolini, Stossberg and Blöchliger, 2016). Also, decentralisation is associated with less income inequality, suggesting that it can contribute to inclusive growth (Stossberg and Blöchliger, 2017).

Table 2.3. **The effect of decentralisation on growth: Main results**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Long term												
$\ln(Y_{it-1}/POP_{it-1})$	-0.022***	-0.021***	-0.019***	-0.019***	-0.020***	-0.014**	-0.020	-0.023	-0.039**	-0.048***	-0.023	-0.048***
	(0.0054)	(0.0053)	(0.0056)	(0.0054)	(0.0049)	(0.0051)	(0.017)	(0.017)	(0.016)	(0.012)	(0.018)	(0.012)
$\ln(PISA_i * schooling_{it-1})$	-0.00038	-0.00051	-0.0058	-0.00030	-0.00057	-0.0039	-0.025	-0.037	-0.063	-0.037	-0.030	-0.034
	(0.0083)	(0.0083)	(0.0097)	(0.0086)	(0.0074)	(0.0073)	(0.037)	(0.037)	(0.046)	(0.033)	(0.037)	(0.033)
$\ln(I_{it-1}/Y_{it-1})$	0.015**	0.016**	0.014**	0.014**	0.018***	0.016***	0.012	0.011	0.0089	0.014	0.012	0.014
	(0.0058)	(0.0057)	(0.0061)	(0.0056)	(0.0054)	(0.0048)	(0.011)	(0.011)	(0.0098)	(0.0091)	(0.011)	(0.0090)
Short term												
$\Delta\ln(PISA_i * schooling_{it})$	-0.15	-0.16	-0.15	0.10	-0.14	0.022	0.10	0.071	-0.16	-0.021	0.077	-0.012
	(0.19)	(0.19)	(0.21)	(0.23)	(0.16)	(0.19)	(0.21)	(0.20)	(0.25)	(0.26)	(0.23)	(0.26)
$\Delta\ln(I_{it}/Y_{it})$	0.0061	0.0062	0.0028	0.0030	0.0070	0.0038	0.0024	0.0024	-0.0032	0.00067	0.0018	0.00087
	(0.0053)	(0.0052)	(0.0044)	(0.0047)	(0.0053)	(0.0050)	(0.0086)	(0.0086)	(0.0085)	(0.0063)	(0.0088)	(0.0064)
Additional variables												
ln(population size)$_{it-1}$	-0.00033	-0.00037	-0.00017	0.0010	0.00023	0.0012	0.094***	0.089**	0.070**	0.049**	0.096***	0.048**
	(0.00079)	(0.00078)	(0.00084)	(0.00085)	(0.00088)	(0.00088)	(0.033)	(0.032)	(0.034)	(0.022)	(0.033)	(0.021)
Average rule of law$_i$	0.0058**	0.0059**	0.0064*	0.0050*	0.0069**	0.0044*						
	(0.0028)	(0.0029)	(0.0033)	(0.0025)	(0.0029)	(0.0025)						
Average employment protection$_i$	-0.0040**	-0.0040**	-0.0054**	-0.0014	-0.0042**	-0.0023						
	(0.0019)	(0.0018)	(0.0020)	(0.0027)	(0.0016)	(0.0022)						
Openness$_{it-1}$	0.0050*	0.0043	0.0068*	0.010**	0.0048*	0.010***	0.011	0.011	0.012*	0.015**	0.012	0.015**
	(0.0026)	(0.0030)	(0.0034)	(0.0039)	(0.0024)	(0.0027)	(0.0073)	(0.0071)	(0.0064)	(0.0064)	(0.0074)	(0.0061)
Inflation$_{it-1}$	-0.044*	-0.044*	-0.047**	-0.015	-0.041	-0.0080	-0.048***	-0.046***	-0.040***	-0.026*	-0.049***	-0.026*
	(0.024)	(0.024)	(0.023)	(0.027)	(0.025)	(0.024)	(0.016)	(0.016)	(0.014)	(0.015)	(0.016)	(0.015)
Credit ratio$_{it-1}$	-0.0042	-0.0044	-0.0057*	-0.0061**	-0.0052*	-0.0075**	-0.0049	-0.0046	-0.0073	-0.0079	-0.0046	-0.0080
	(0.0028)	(0.0029)	(0.0031)	(0.0027)	(0.0029)	(0.0030)	(0.0058)	(0.0058)	(0.0060)	(0.0058)	(0.0058)	(0.0057)
Old-age dependency ratio$_{it-1}$	-0.0029	-0.0046	-0.0036	-0.039	-0.0038	-0.024	0.17**	0.16**	0.14**	0.0046	0.16**	0.0035
	(0.031)	(0.032)	(0.031)	(0.026)	(0.029)	(0.023)	(0.074)	(0.073)	(0.065)	(0.048)	(0.076)	(0.048)

Table 2.3. **The effect of decentralisation on growth: Main results** *(cont'd.)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Decentralisation												
Government size	-0.021	-0.021	-0.023	-0.024	-0.032**	-0.049**	-0.034*	-0.041**	-0.0044	-0.019	-0.045*	-0.017
	(0.018)	(0.018)	(0.017)	(0.018)	(0.015)	(0.018)	(0.017)	(0.018)	(0.030)	(0.029)	(0.023)	(0.029)
Spending decentralisation	-0.019	-0.023			-0.036***		0.030	0.086*			0.045	
	(0.013)	(0.018)			(0.0097)		(0.040)	(0.048)			(0.033)	
Intergovernmental transfers		0.011						-0.080*				
		(0.025)						(0.041)				
Revenue decentralisation			-0.027						0.11			
			(0.019)						(0.082)			
Tax decentralisation				0.017		-0.010				0.084*		0.065
				(0.028)		(0.020)				(0.049)		(0.056)
Spending decentralisation X government size					0.44***						-0.25	
					(0.12)						(0.27)	
Tax decentralisation X government size						0.88***						0.27
						(0.19)						(0.41)
Observations	404	404	410	553	404	553	404	404	410	553	404	553
R-squared	0.758	0.759	0.760	0.727	0.782	0.766	0.885	0.887	0.884	0.870	0.886	0.871
Country-fixed effects	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Asterisks (*, **, ***) indicate the significance level (10%, 5%, 1%) of the coefficients. The standard errors are adjusted for country clusters. The long-run steady state coefficients can be calculated based on these short-run coefficients as ratios of the short-term coefficient to the negative of the convergence coefficient Φ.

Source: Authors' calculations.

Table 2.4. **The effect of decentralisation on growth: federal versus unitary countries**

Results by country type

	% of GDP			% of overall exp. or rev.		
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(Y_{it-1}/POP_{it-1})$	-0.016***	-0.015**	-0.012**	-0.015***	-0.014**	-0.011**
	(0.0049)	(0.0055)	(0.0052)	(0.0046)	(0.0055)	(0.0054)
Government size	-0.044**	-0.045**	-0.045**	-0.049***	-0.047***	-0.039**
	(0.017)	(0.016)	(0.018)	(0.015)	(0.015)	(0.017)
Spending decentralisation X federal country indicator	-0.027***			-0.013***		
	(0.0078)			(0.0040)		
Spending decentralisation X unitary country indicator	0.0067			0.0048		
	(0.010)			(0.0054)		
Revenue decentralisation X federal country indicator		-0.035***			-0.015***	
		(0.012)			(0.0054)	
Revenue decentralisation X unitary country indicator		0.017			0.0085	
		(0.016)			(0.0088)	
Tax decentralisation X federal country indicator			-0.021			-0.0072
			(0.017)			(0.0058)
Tax decentralisation X unitary country indicator			0.069***			0.025**
			(0.021)			(0.0092)
Observations	404	410	553	404	410	553
R-squared	0.788	0.782	0.766	0.797	0.785	0.762
Country-fixed effects	No	No	No	No	No	No
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: Indicators and their interactions are added to the baseline equation. Asterisks (*, **, ***) indicate the significance level (10%, 5%, 1%) of the coefficients. The standard errors are adjusted for country clusters. The long-run steady state coefficients can be calculated based on these short-run coefficients as ratios of the short-term coefficient to the negative of the convergence coefficient Φ.

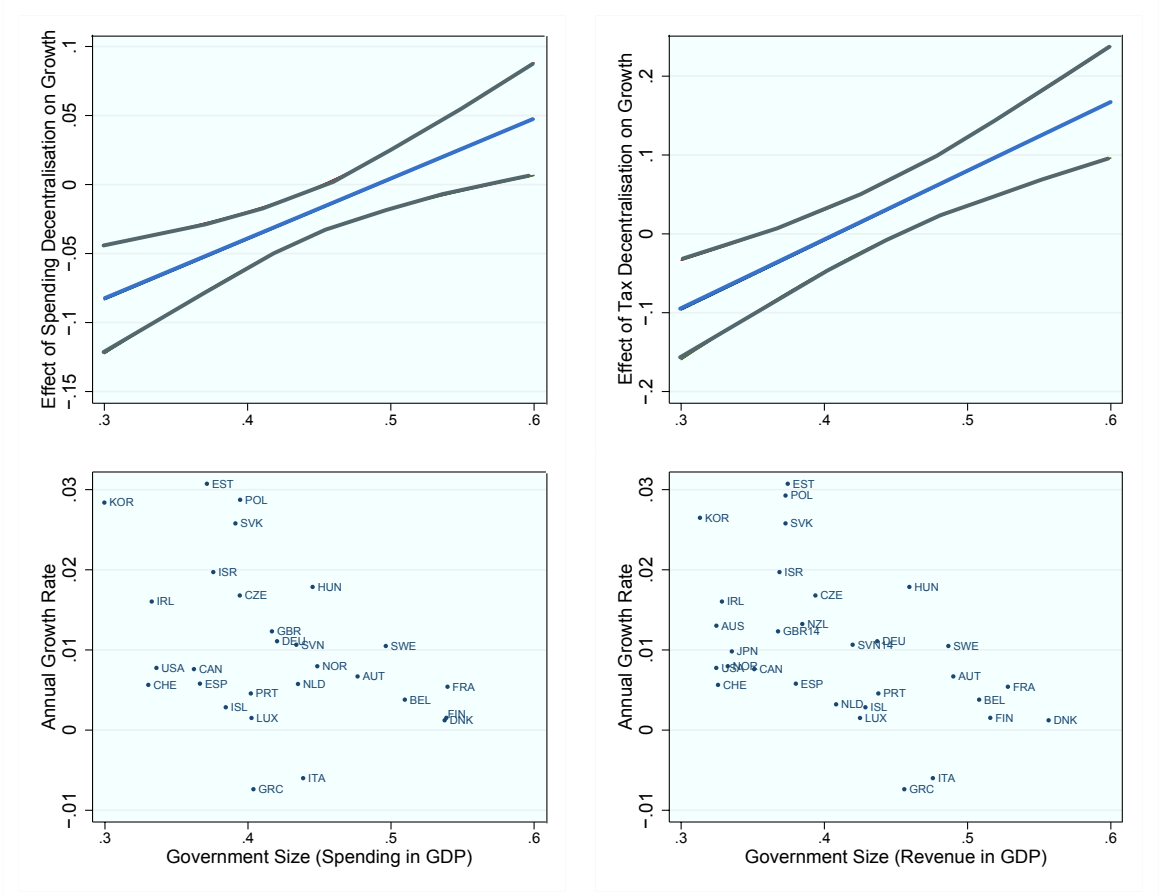
Source: Authors' calculations.

Decentralising public functions to sub-national governments could become more pressing when the government is large since a large government tends to slow down growth. Indeed spending and tax revenue decentralisation seems to become growth-enhancing when the government is larger than around 48% or 44% of GDP for the two decentralisation measures, respectively (Figure 2.4).

A balanced assignment of responsibilities across policy functions is more conducive to growth, suggesting that sub-national governments can exploit economies of scope and policy complementarities if they are responsible for a range of functions (Box 2.1). Interacting government quality with decentralisation hardly delivers any meaningful results, probably because devolved governments are also those with higher quality (Kyriacou, Muinelo-Gallo and Roca-Sagalès, 2011).

Figure 2.4. **Larger governments should be more decentralised**

Interacting government size with spending and tax revenue decentralisation



Note: The figure shows how the effect of spending decentralisation (vertical axis) turns from negative to positive when the size of government, measured as spending or revenue to GDP (horizontal axis), increases.

Source: Authors' calculations.

Box 2.1. **Balanced decentralisation**

Intergovernmental fiscal frameworks are balanced if sub-national governments have similar levels of responsibility for policy functions such as education, healthcare and infrastructure or spending transactions, such as investment, wages and others. A balanced assignment may allow for more flexible administrative arrangements across policy functions and for better reaping economies of scale and scope. Moreover, policy complementarities may be easier to achieve. Indeed balanced decentralisation could be a more important driver for long-term growth than decentralisation alone (Blöchliger and Kantorowicz, 2015). Moreover, decentralisation of individual spending items delivers relatively insignificant results, suggesting that no spending item should be preferred over another, but that all should be devolved to a similar extent (Eyraud and Lusinyan, 2011).

To test whether decentralisation's impact on growth varies with how balanced intergovernmental frameworks are, a measure of "balanced assignment" is developed (Table 2.5).This measure is defined as the variance of the sub-national spending shares in education, healthcare, social protection, investment, wages and subsidies. As such it covers almost all government spending. This implicitly assumes that spending decentralisation should be equal across functions, which might not necessarily be the case. For example, from a normative perspective, neighbourhood services should probably be more decentralised than social security systems. As an alternative, the variance of the *differences* between average decentralisation in a policy area and decentralisation in that country is taken, which takes into account that "optimal" decentralisation may vary across policy areas. However, the results do not change much.

Table 2.5. **Balanced decentralisation is conducive to growth**

Interacting decentralisation with the variance of decentralisation across functions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	% of GDP		% of Total Exp.		% of GDP		% of Total Exp.	
Lagged dependent variable	-0.022***	-0.022***	-0.022***	-0.023***	-0.020	-0.029*	-0.022	-0.028*
	(0.0052)	(0.0053)	(0.0052)	(0.0057)	(0.016)	(0.015)	(0.016)	(0.014)
Government size	-0.025	-0.030*	-0.039*	-0.040**	-0.040**	-0.054**	-0.030	-0.036
	(0.019)	(0.015)	(0.019)	(0.016)	(0.018)	(0.024)	(0.018)	(0.027)
Spending decentralisation	-0.034*	-0.036***	-0.018**	-0.017**	0.049	0.061	0.022	0.0071
	(0.019)	(0.012)	(0.0081)	(0.0071)	(0.045)	(0.037)	(0.021)	(0.017)
Spending decentralisation X government size		0.54***		0.20**		-0.25		-0.023
		(0.16)		(0.073)		(0.29)		(0.13)
Balanced assignment	0.0021	0.0025	0.0023	0.0048	-0.0037	-0.0023	-0.0042	0.0039
	(0.0017)	(0.0031)	(0.0015)	(0.0036)	(0.0042)	(0.0045)	(0.0049)	(0.0051)
Spending decentralisation X balanced assignment		0.023		0.020*		0.055*		0.036**
		(0.015)		(0.011)		(0.028)		(0.016)
Observations	404	404	404	404	404	404	404	404
R-squared	0.763	0.786	0.767	0.790	0.886	0.890	0.886	0.890
Country-fixed effects	No	No	No	No	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Indicators and their interactions are added to the baseline equation. Asterisks (*, **, ***) indicate the significance level (10%, 5%, 1%) of the coefficients. The standard errors are adjusted for country clusters. The long-run steady state coefficients can be calculated based on these short-run coefficients as ratios of the short-term coefficient to the negative of the convergence coefficient Φ.

Source: Authors' calculations.

The role of a balanced assignment of responsibilities is positively and significantly associated with growth, although the economic effect is weak. For an average decentralised country, improving the balance of responsibility assignment by one standard deviation improves the growth prospects of a decentralisation reform by 0.01 percentage point or an increase in GDP per capita by around 0.2-0.3%. A balanced assignment alone has no effect on growth. The results suggest that decentralisation reforms should be aligned with the broader intergovernmental framework and co-ordinated between policy functions.

Decentralisation of individual spending categories

The empirical results suggest that the decentralisation of some spending items could be detrimental for growth, but becomes positive when the government is larger (Table 2.6). Decentralising education is associated with lower growth but becomes positive when education spending is large. Decentralised social protection becomes significantly positive when measured in terms of overall social spending rather than GDP (not shown). Public investment per se has a positive and sizeable effect on growth. Sub-national public investment, which makes up around 65% of total public investment OECD-wide, is correlated with less growth. Some differences become apparent between federal and unitary country: while unitary countries would benefit from a more decentralised health-care system, the adverse effect of public investment decentralisation on growth is driven by federal countries only, pointing at non-linearities in the association between sub-national investment and growth (not shown here). Overall, the results suggest again that balanced decentralisation is more important than a focus on one particular policy function.

Table 2.6. **Decentralising individual policy functions has little effect, but more so if much is spent**

	Education	Health	Social protection	Investment	Wages	Subsidies
Lagged dependent variable	-0.031***	-0.024***	-0.023***	-0.015**	-0.019***	-0.014**
	(0.0043)	(0.0043)	(0.0038)	(0.0056)	(0.0053)	(0.0053)
Government size	-0.061***	-0.040*	-0.044*	-0.035**	-0.058*	-0.050**
	(0.018)	(0.021)	(0.024)	(0.014)	(0.032)	(0.018)
Spending item	0.16	-0.068	-0.0047	0.40***	0.11	0.20
	(0.10)	(0.070)	(0.031)	(0.081)	(0.097)	(0.17)
Decentralisation of spending item	-0.14*	0.042	0.063	-0.36**	-0.0013	-1.21***
	(0.072)	(0.040)	(0.11)	(0.14)	(0.043)	(0.30)
Interaction with decentralisation item	14.7***	-2.76	-0.58	4.73	-0.34	25.5***
	(5.23)	(2.90)	(1.18)	(7.89)	(1.17)	(8.86)
Observations	425	425	425	495	473	495
R-squared	0.834	0.824	0.822	0.782	0.761	0.784
Country-fixed effects	No	No	No	No	No	No
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: Indicators and their interactions are added to the baseline equation. Government size is measured as general government spending as a ratio of GDP. Asterisks (*, **, ***) indicate the significance level (10%, 5%, 1%) of the coefficients. The standard errors are adjusted for country clusters. The long-run steady state coefficients can be calculated based on these short-run coefficients as ratios of the short-term coefficient to the negative of the convergence coefficient Φ.

Source: Authors' calculations.

Government investment decentralisation affects growth both in a direct and indirect way. The direct channel links public investment decentralisation to growth; and as shown above, the corresponding coefficient suggests that decentralising public investment is bad for growth. The indirect channel links decentralisation to overall investment and then overall investment to growth. This channel suggests that decentralisation underpins growth (Box 2.2). Bringing the results of the two channels together suggests that investment carried out by the national government might be more growth-promoting than investment carried out by sub-national governments. While devolution raises overall public investment, the sub-central part of it seems to be less effective than investment carried out by the central level. In a decentralised environment, public investment requires close co-ordination across

government levels, taking network externalities into account, if it is to become growth-promoting (OECD, 2016 or 2013a). Using public, rather than overall, investment as the dependent variable leaves results largely unchanged.

Box 2.2. **Decentralisation and investment**

Decentralising fiscal frameworks could underpin investment in productive private and public capital. The decentralisation of spending or taxing power to sub-national governments tends to raise the overall share of the budget devoted to public investment and education (OECD, 2013b). Sub-national governments will compete for residents and firms, by providing more productive public infrastructure and tailoring it to local needs. This, in turn, is thought to produce a "crowding-in" effect as businesses will invest more, thereby increasing productivity and competitiveness of the local corporate sector. Given the competition for mobile production factors, there is some evidence that sub-national governments even tend to over- rather than under-invest in public infrastructure (Delgado and Alvarez, 2007). Moreover, central government often supports sub-national governments with capital grants, and may thereby foster investment spending at the sub-national level.

The results of a set of investment regressions linking spending, revenue or investment decentralisation to the share of overall physical investment in GDP tends to confirm a positive association between the two (Table 2.7). A 1 percentage point increase in the sub-central spending share raises investment growth in the economy by 0.02 percentage points or, in the long run, the investment share in GDP by around 0.2 percentage points, in line with earlier findings of Blöchliger, Égert and Bonesmo Fredriksen (2013) or Kappeler and Välilä (2012). Decentralising public investment rather than spending per se has an even stronger effect. The findings also point to the "crowding in" effect of public investment as government investment brings in more private investment rather than deterring it. Similar results are obtained when the regressions are run for public rather than total investment, supporting the crowding-in hypothesis (not shown here). Finally, capital grants do not spur overall investment, suggesting that sub-national governments scale back self-financed investment once they obtain additional capital grants. As such, grants have no multiplier role for sub-central investment, yet they may have a role in helping to co-ordinate investment projects between the central and sub-central level.

Summing up, the regression results suggest that decentralisation is likely to foster investment. Since a higher share of investment in GDP is associated with more growth (Fournier and Johansson, 2016), decentralisation might, therefore, be associated with more growth.

Box 2.2. **Decentralisation and investment** *cont.*

Table 2.7. **Effect of decentralisation on overall investment**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Long term								
I_{it-1}/Y_{it-1}	-0.12*** (0.027)	-0.13*** (0.028)	-0.16*** (0.026)	-0.16*** (0.026)	-0.12*** (0.033)	-0.18*** (0.029)	-0.11*** (0.032)	-0.16*** (0.024)
Real interest rate $_{it-1}$	0.024 (0.029)	0.024 (0.030)	-0.056 (0.045)	-0.057 (0.046)	0.0084 (0.031)	-0.063 (0.048)	0.0061 (0.031)	-0.074 (0.046)
$\ln(Y_{it-1}/POP_{it-1})$	-0.046 (0.081)	-0.054 (0.077)	-0.082 (0.11)	-0.093 (0.11)	-0.098 (0.075)	-0.24* (0.12)	-0.11* (0.061)	-0.24*** (0.085)
Government debt/GDP ratio $_{it-1}$	-0.0043*** (0.0013)	-0.0045*** (0.0014)	-0.0052*** (0.0016)	-0.0053*** (0.0017)	-0.0030 (0.0021)	-0.0071*** (0.0024)	-0.0030 (0.0021)	-0.0064** (0.0024)
$\ln(PISA_i * schooling_{it-1})$			0.0042 (0.0033)	0.0046 (0.0032)		-0.0022 (0.0047)		-0.00043 (0.0043)
Credit ratio $_{it-1}$			-0.0046*** (0.0014)	-0.0048*** (0.0015)		-0.0063*** (0.0019)		-0.0055*** (0.0017)
Additional variables								
Openness$_{it-1}$			-0.0012 (0.0015)	-0.0012 (0.0015)		0.0023 (0.0021)		0.0026 (0.0018)
Squared inflation$_{it-1}$			-0.52 (0.73)	-0.54 (0.74)		-0.72 (0.81)		-0.67 (0.80)
Decentralisation								
Government size $_{it-1}$	-0.0037 (0.0087)	-0.0026 (0.0084)	-0.0059 (0.010)	-0.0055 (0.010)	-0.0093 (0.0100)	-0.022* (0.012)	-0.0030 (0.0072)	-0.011 (0.0091)
Public investment ratio$_{it-1}$	-0.0087 (0.064)	-0.0082 (0.065)	-0.012 (0.062)	-0.0033 (0.060)	0.11* (0.063)	0.14* (0.070)	0.098* (0.053)	0.098 (0.058)
Investment decentralisation $_{it-1}$	0.30*** (0.10)	0.29*** (0.095)	0.38*** (0.096)	0.37*** (0.088)				
Grants $_{it-1}$		0.067 (0.072)		0.052 (0.086)				
Spending decentralisation $_{it-1}$					0.0063 (0.0070)	0.022** (0.0094)		
Revenue decentralisation $_{it-1}$							0.0056 (0.0083)	0.023** (0.011)
Observations	454	454	360	360	407	319	411	323
R-squared	0.381	0.382	0.446	0.446	0.368	0.447	0.367	0.440
Country-fixed effects	No	No	No	No	No	No	No	No
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Asterisks (*, **, ***) indicate the significance level (10%, 5%, 1%) of the coefficients. The standard errors are adjusted for country clusters.

The overall amount of money spent in an individual policy area matters for the effect of decentralisation in that policy area. This mirrors earlier findings that decentralising a large government has a stronger effect on growth than decentralising a small one. Decentralising education is positively associated with growth when education spending exceeds 5% of GDP. Also, investment decentralisation is no longer negative for growth when public investment is considerable. Large public health-care systems might require more central control, probably owing to the multitude of stakeholders in the health-care sector operating under a soft budget constraint.

Notes

1. Luxembourg is excluded in the estimations as the large share of cross-border workers affects the measure of the potential output to working-age population ratio.
2. The cyclically adjusted investment rate is the residual in the regression of the investment rate on the OECD output gap. It is replaced by the cyclically adjusted investment rate of the private sector in the regressions that include public investment to avoid double counting.
3. In the case of the United States, the 2009 average is used as the 2006 reading score is not available.
4. Replacing the average rule of law with the time-varying indicator yields broadly unchanged results (assuming that the index pre-1996 is equal to the value in 1996).
5. For instance, central government spending on social security depends on the cycle, while sub-central spending on education does less so, thereby affecting overall decentralisation ratios cyclically. Such cyclically induced changes should be distinguished from policy induced changes to intergovernmental fiscal frameworks.
6. By contrast, human capital no longer comes out positively and significantly in any specification. This can be explained with the relatively high bi-variate correlation between human capital and the decentralisation variables.
7. The vertical fiscal imbalance is the difference between sub-central spending and own sub-central revenue; hence it is a residual. It is sometimes seen as a better indicator to gauge the role of decentralisation for growth or debt dynamics as it reflects not only transfers but also the sub-national budget balance (Aldasoro and Seiferling, 2014).

References

Aldasoro, I. and X. Seiferling (2014), "Vertical fiscal imbalances and the accumulation of government debt", *IMF Working Paper*, No. 14/209.

Asatryan, Z., and L. P. Feld (2014), "Revisiting the link between growth and federalism: A Bayesian model averaging approach", *Journal of Comparative Economics*, Vol. 43.

Baldwin, R. and P. Krugmann (2004), "Agglomeration, integration and tax harmonization", *NBER Working Paper,* No. 9290.

Barro, R. J. (2015), "Convergence and modernisation", *The Economic Journal*, Vol. 125, pp. 911-942.

Bartolini, D., S. Stossberg and H. Blöchliger (2016), "Fiscal decentralisation and regional disparities", OECD Economics Department Working Papers**,** No. 1330, OECD Publishing, Paris,http://dx.doi.org/10.1787/5jlpq7v3j237-en.

Baskaran, T., L. P. Feld and J. Schnellenbach (2016), "Fiscal federalism, decentralization, and economic growth: A meta-analysis", *Economic Inquiry,* Vol. 54.

Besley, T. and A.C. Case (1995), "Incumbent behavior: Vote-seeking, tax-setting, and yardstick competition", *American Economic Review,* Vol. 85.

Besley, T. and S. Coate (2003), "Centralized versus decentralized provision of local public goods: A political economy analysis", *Journal of Public Economics,* Vol. 87.

Bloch, D., et al. (2016), "Trends in public finance: Insights from a new detailed dataset", *OECD Economics Department Working Papers*, No. 1345, OECD Publishing, Paris, http://dx.doi.org/10.1787/4d3d8b25-en.

Blöchliger, H. and J. Kantorowicz (2015), "Fiscal constitutions: An empirical assessment", *OECD Economics Department Working Papers*, No. 1248, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jrxjctrxp8r-en.

Blöchliger, H., B. Égert and K. Bonesmo Fredriksen (2013), "Fiscal federalism and its impact on economic activity, public investment and the performance of educational systems", *OECD Economics Department Working Papers*, No. 1051, OECD Publishing, http://dx.doi.org/10.1787/5k4695840w7b-en.

Cournède, B. and O. Denk (2015), "Finance and economic growth in OECD and G20 countries", *OECD Economics Department Working Papers*, No. 1223, OECD Publishing, Paris, http://dx.doi.org/10.1787/5js04v8z0m38-en.

Delgado, M. and I. Alvarez (2007), "Network infrastructure spillovers in private production sectors: Evidence from Spanish high capacity roads", *Applied Economics,* No. 39.

Eyraud, L. and L. Lusinyan (2011), "Decentralizing spending more than revenue: Does it hurt fiscal performance?", *IMF Working Paper*, No. 226.

Fournier, J-L. and A. Johansson (2016), "The effect of the size and mix of public spending on growth and inequality", *OECD Economics Department Working Papers*, No. 1344

Kappeler, A. and T. Välilä (2007), "Composition of public investment and fiscal federalism: Panel data evidence from Europe", *Economic and Financial Report,* No. 2007/02, European Investment Bank.

Kyriacou, A. P., L. Muinelo-Gallo and O. Roca-Sagalés (2015), "Fiscal decentralization and regional disparities: The importance of good governance", *Papers in Regional Science*, No. 94, pp. 89–107.

Mankiw, G.N., D. Romer and D. N. Weil (1992), "A contribution to the empirics of economic growth", *Quarterly Journal of Economics*, Vol. 107, pp. 407–437.

OECD (2016), OECD Economic Surveys: Poland 2016*,* OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_surveys-pol-2016-en.

OECD (2013a), *Investing Together: Working Effectively across Levels of Government*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264197022-en.

OECD (2013b), *Fiscal Federalism 2014: Making Decentralisation Work*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264204577-en.

OECD/KIPF (Korea Institute of Public Finance) (2016), *Fiscal Federalism 2016: Making Decentralisation Work*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264254053-en.

OECD/KIPF (2013), *Measuring Decentralisation. Concept and Policies*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264174849-en.

Price, R., T. Dang and J. Botev (2015), "Adjusting fiscal balances for the business cycle: New tax and expenditure elasticity estimates for OECD countries", OECD Economics Department Working Papers, No. 1275, OECD Publishing, Paris.

Spolaore, E. (2015), "The political economy of European integration", *CESifo Working Paper,* No. 5247.

Stossberg, S. and H. Blöchliger (2017), "Fiscal decentralisation and income inequality: Empirical evidence from OECD countries", *Journal of Economics and Statistics*, http://dx.doi.org/10.1515/jbnst-2017-1108.

Tiebout, C. (1956),"A pure theory of local expenditures", *Journal of Political Economy,* Vol. 64, No. 5.

Weingast, B. (1995), "The economic role of political institutions: Market-preserving federalism and economic development", Journal of Law, Economics and Organization, Vol. 20.

Wildasin, D. E. (1989), "Interjurisdictional capital mobility: Fiscal externality and a corrective subsidy", *Journal of Urban Economics,* Vol. 25.

Zodrow, G. and P. Mieszkowski (1986), "Pigou, Tiebout, property taxation, and the underprovision of local public goods", *Journal of Urban Economics*, Vol. 19, No. 3.

Further reading

Bird, R. and E. Slack (2015), "Local taxes and local expenditures: Strengthening the Wicksellian connection", in *Interaction between Local Expenditure Responsibilities and Local Tax Policy, The Copenhagen Workshop 2013*, The Korea Institute of Public Finance and the Danish Ministry for Economic Affairs and the Interior.

Busenmeyer, M.R. (2008), "The impact of fiscal decentralisation on education and other types of spending", *Swiss Political Science Review,* Vol. 14, No. 3.

Enikolopov, R. and E. Zhuravskaya (2007), "Decentralization and political institutions", *Journal of Public Economics*, Vol. 91.

Foremny, D. and J. von Hagen (2012), "Fiscal federalism in times of crisis", *CEPR Discussion Paper*, No. DP9154.

Fredriksen, K. (2013), "Decentralisation and economic growth – Part 3: Decentralisation, infrastructure investment and educational performance", *OECD Working Papers on Fiscal Federalism*, No. 16, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k4559gg7wlw-en.

Martínez-Vazquez, J., and R.M. McNab (2006), "Fiscal decentralization, macrostability, and growth", *Hacienda Pública Española/Revista de Economia Publica* 179, pp. 25–49.

Nerlove, M. (2000), "Growth rate convergence, fact or artefact? An essay on panel data econometrics", Chapter 6 in Krishnakumar, J. and E. Ronchetti (eds.), *Panel Data Econometrics: Future Directions*, pp. 3-33.

Oates, W. E. (1972), *Fiscal Federalism*, Harcourt Brace Jovanovich, New York.

OECD (2012), *Education at a Glance 2012: OECD Indicators,* OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2012-en.

Riedl, A. and S. Rocha-Akis (2008), "Testing the tax competition theory: How elastic are national tax bases in Western Europe?", *Österreichische Nationalbank Working Paper,* No. 142, Vienna.

Rodden, J. (2002), "The dilemma of fiscal federalism: Grants and fiscal performance around the world", *American Journal of Political Science*, 46(3), pp. 670-687.

Annex 2.A1

Descriptive statistics

Table 2.A1.1. **Descriptive statistics**

Variable	Mean	Min	Max	Standard deviation	Mean
$\ln(Y_{it}/POP_{it})$	10.5889	9.2677	11.6764	0.3726	10.5889
$\ln(I_{it}/Y_{it})$	-1.4724	-1.8763	-0.9745	0.1409	-1.4724
$\ln(PISA_i * schooling_{it})$	8.4312	6.6564	8.9149	0.3588	8.4312
Average rule of law$_i$	1.2874	-0.5234	1.9484	0.5870	1.2874
Employment protection$_i$	2.3808	1.0048	3.7949	0.5717	2.3808
Openness$_{it}$	0.6984	0.0666	3.7425	0.4634	0.6984
ln(population size)$_{it}$	2.2759	-1.7201	5.4801	1.4760	2.2759
Inflation$_{it}$	0.1070	-0.0171	5.6788	0.3447	0.1070
Credit ratio$_{it}$	0.7316	0.0869	2.7281	0.4573	0.7316
Old dependency ratio$_{it}$	0.2084	0.0718	0.4202	0.0551	0.2084
Spending size (in GDP)	0.4098	0.1950	0.5779	0.0684	0.4098
Revenue size (in GDP)	0.3985	0.2089	0.5565	0.0701	0.3985
Education expenditure / GDP	0.0449	0.0218	0.0730	0.0096	0.0449
Health expenditure / GDP	0.0547	0.0017	0.0819	0.0160	0.0547
Social protection expenditure / GDP	0.1478	0.0061	0.2492	0.0506	0.1478
Public investment / GDP	0.0369	0.0056	0.0712	0.0102	0.0369
Wage expenses / GDP	0.1058	0.0595	0.1701	0.0243	0.1058
Subsidies / GDP	0.0148	0.0003	0.0513	0.0097	0.0148
Education decentralisation (share in GDP of local expend.)	0.1443	0.0253	0.3544	0.0692	0.1443
Health decentralisation (share in GDP of local expend.)	0.0881	0.0097	0.2322	0.0583	0.0881
Social protection decen. (share in GDP of local expend.)	0.0515	-0.0018	0.1684	0.0438	0.0515
Public investment decen. (share in GDP of local expend.)	0.0603	0.0034	0.2132	0.0372	0.0603
Wage decentralisation (share in GDP of local expend.)	0.0277	0.0000	0.0593	0.0144	0.0277
Subsidies decentralisation (share in GDP of local expend.)	0.0191	0.0000	0.0797	0.0224	0.0191

Source: Authors' calculations.

Chapter 3

Globalisation, decentralisation and inclusive growth

by
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This chapter extends the analysis of decentralisation and inclusive growth to capture the role of globalisation. Country specificities turn out to matter: while countries have already decentralised spending and revenues more than enough given their openness and scale, other countries are excessively centralised given their fiscal profile, and these would benefit from more decentralisation. Depending on a country's characteristics and its public finance mix, the scope for further improvements of both growth and equity outcomes varies widely. Spending and revenue decentralisation tend to boost economic growth for economies that have a relatively higher degree of trade openness. Fiscal decentralisation has a more ambiguous and possibly even negative effect on inequality than on growth, especially for economies with a higher degree of globalisation. Moreover, for some countries, there is an apparent trade-off between growth and equity, when it comes to the "optimal" degree of spending and revenue decentralisation.

Introduction[1]

Globalisation is a powerful force that can create large economic gains through greater economies of scale and scope, but it also exposes economies to shocks that can result in both winners and losers. Increasing attention is being placed on how policies should respond to greater degrees of globalisation and openness, in light of sluggish growth and high inequality in many countries (OECD, 2017). Centralisation and decentralisation of spending and revenue is a broad policy option that many countries have employed, in part to offset the increased volatility associated with aspects of greater openness to trade and investment flows. The relative size of countries and their governments – both central and sub-central – also play a role in determining the right degree of decentralisation. Recent OECD analyses have examined how the public finance mix and the size of governments together affect growth and equity (Fournier and Johansson, 2016; Cournede et al., 2017, Boadway and Dougherty 2018). These studies find evidence that decentralisation is a positive "win" for economic growth and likely for equity as well.

In order to clarify these interrelationships, this paper takes advantage of two recently complied datasets, one on public finance and growth (Bloch et al., 2016), and the other on income distribution (Murtin et al., 2016). The analytical framework is a combination of growth regressions (*à la* Barro, 2015) and estimates of income decile ratios. This follows from the framework developed in Fournier and Johansson (2016), which was also used for economic growth and decentralisation in the previous chapter by Blöchliger and Akgun.

This chapter adds countries' degree of globalisation to the analysis of decentralisation and government size, and finds that with this additional channel, the apparent "win-win" outcome for growth and equity becomes considerably more complex. Country specificities really matter: some countries have already decentralised spending and revenues more than enough given their openness and scale, and these would benefit from more centralisation, while other countries are excessively centralised given their fiscal profile, and these would benefit from more decentralisation. Depending on a country's characteristics and its public finance mix, the scope for further improvements of *both* growth and equity outcomes varies widely. Moreover, for some countries, there is an apparent trade-off between growth and equity, when it comes to the "optimal" degree of spending and revenue decentralisation.

Beyond the main message that country specificities matter, some broad findings include:

- Government expenditure *tends to be higher and more centralised on average* in open economies that are exposed to a greater degree of terms-of-trade volatility.
- Spending and revenue decentralisation tend to *boost economic growth* for economies that have a relatively *higher degree of trade openness*. This is especially true if spending is locally financed.
- Fiscal decentralisation has a *more ambiguous and possibly even negative effect on inequality* than on growth, especially for economies with a *higher degree of globalisation*. However, revenue decentralisation is more pro-equity than spending decentralisation in the typical economy's case.

The rest of this chapter proceeds by first discussing the interlocking literatures on globalisation, decentralisation, government size, growth and inequality. Second, the empirical methodology for estimating and identifying the effect of decentralisation on growth and inequality is explained. Third, the data construction is described, and the main regression results are discussed. Fourth, the country-specific marginal effects are presented along with summary results. The last section concludes.

Connecting decentralisation outcomes with globalisation

Globalisation and government size

Globalisation and government size are closely inter-related empirically. As Dani Rodrik (1998) showed, more open economies can motivate governments to provide greater social insurance, in the form of a larger size of government. The existence of more intensive forms of external risk and volatility, notably in the form of terms-of-trade shocks, means that more open economies will push for greater government transfers—social security, pensions, unemployment insurance, job training, and so forth—that mitigate external risk. The relationship between openness, terms-of-trade volatility and overall government expenditure is robust, as show in Table 3.1, including for the period spanning the global financial crisis. Less-often discussed is the relationship with *sub-national* government spending, which is in the opposite direction for both openness and volatility. At both the overall and sub-national levels, the interaction of openness and volatility has a further correlation with government spending in the same (opposite) directions, which can also be seen in the cross-section of country observations, in Figure 3.1. These contrasting correlations suggest that decentralisation may play a complementary role in facing globalisation's risks.

Table 3.1.**Correlations of overall and local government size with globalisation**

OLS regressions

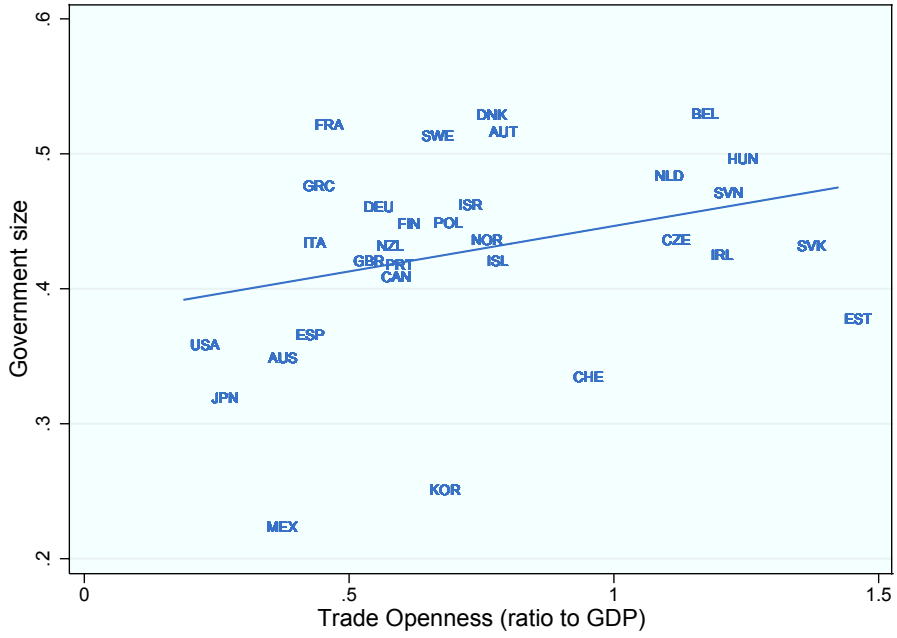
	Overall government expenditure (% of GDP)		Local government expenditure (% of total)	
Globalisation measures				
Openness	0.035**	0.037*	-0.036***	-0.017**
	(0.017)	(0.021)	(0.01)	(0.0073)
Terms of trade volatility	0.0057*	0.0072**	-0.0050***	-0.0060***
	(0.0031)	(0.0035)	(0.0018)	(0.0017)
Terms of trade volatility x Openness	0.022***	0.023***	-0.0089**	-0.0078
	(0.0066)	(0.007)	(0.0044)	(0.0048)
Control variables				
Urbanisation	0.11	0.072	-0.24***	-0.20***
	(0.092)	(0.11)	(0.058)	(0.077)
Population growth	-1.87***	-1.79**	0.82*	0.19
	(0.56)	(0.70)	(0.43)	(0.37)
GDP per capita growth	-0.51***	-0.45***	0.076**	0.063
	(0.07)	(0.086)	(0.037)	(0.042)
Government size			0.12***	0.12***
			(0.039)	(0.037)
Observations	1 113	889	598	400
R-squared	0.162	0.119	0.198	0.168
Sample	Full	Pre-crisis	Full	Pre-crisis

Note: Based on country-year observations over the 1980-2015 period (full) or 1980-2008 (pre-crisis).

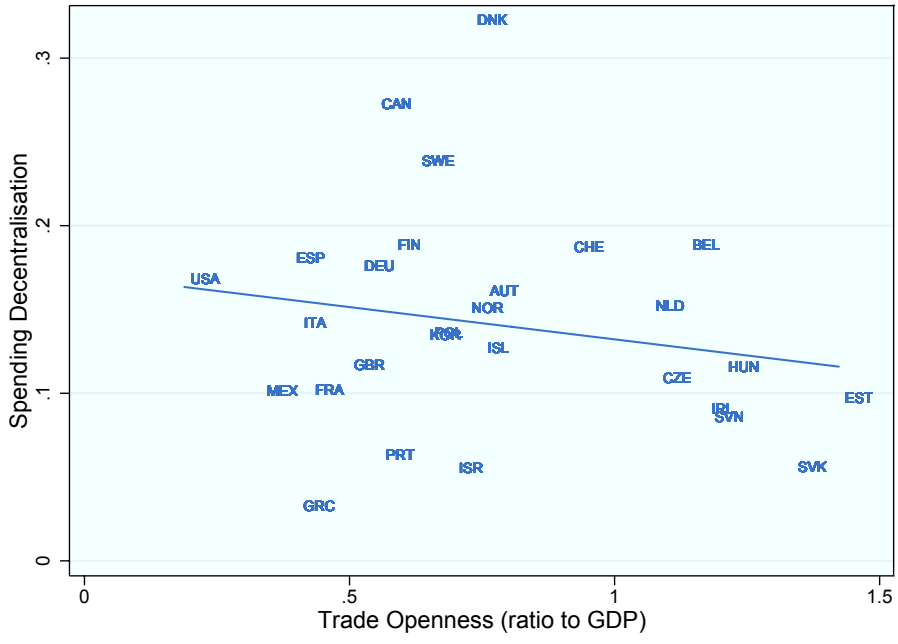
Source: Computations based on OECD Public Finance database.

Figure 3.1. **Central and local government spending relate to globalisation (openness) in opposite ways**

Panel A: Overall government size and trade openness



Panel B: Local government share and trade openness



Note: Data refer to 2013-14.

Source: OECD Fiscal Federalism database.

Government size, country size and (de)centralisation are also closely related. As shown by Alberto Alesina (2003), "optimal" country size can be determined through a cost-benefit analysis, balancing the benefits of size and the costs of heterogeneity. In a large country, per capita costs may be low, but the heterogeneous preferences of a large population make it hard to deliver services and formulate policy. Smaller countries may find it easier to respond to citizen preferences in a democratic way. Decentralisation can be considered as an extension of this problem, seeking to address heterogeneity while maintaining territorial cohesion. In this paper, we will focus on *fiscal* decentralisation, defined in a traditional way, for state and local spending and revenues, as a share of overall totals. In the traditional Musgrave-Oates formulation, fiscal federalism theory implies that the benefits of decentralisation are positively correlated with variation in demand for publicly provided goods (Musgrave, 1959; Oates, 1972). The literature by Alesina and collaborators (Alesina and Spolaore, 1997; Alesina and Wacziarg, 1998; Alesina et al., 2005) suggests that in general, globalisation may reduce the costs of and increase the supply of decentralisation, as an answer to demands for greater local authority. Paradoxically, a high degree of globalisation may actually trigger greater fiscal *centralisation*, particularly of tax revenues, as larger fiscal units can help to pool economic resources to provide insurance for regions affected by shocks (Garrett and Rodden, 2003). For instance, trade shocks have been shown to negatively affect the delivery of local public services in the United States, where extensive decentralisation of expenditure and revenue makes it difficult for trade-exposed localities to make up for lost revenues (Feler and Senses, 2017).[2]

Decentralisation and inclusive growth, via government size

The above literature focuses on the interrelationships between globalisation, government size and decentralisation. This paper makes an additional link of all three to *inclusive growth*, simply defined as the effects on both economic growth and equity. There is a large literature on growth and decentralisation, and a fledgling one on equity and decentralisation (see Johansson, 2016). The theoretical literature on the economics of fiscal federalism has identified several potential channels through which fiscal decentralisation influences economic growth. The traditional literature focuses on the efficiency aspects of decentralisation (Tiebout, 1956). Decentralisation increases economic efficiency as local governments can be better than national governments in providing services to citizens due to closeness and informational advantages. Furthermore, the possibility of experimentation and competition between local governments in the delivery of public services, coupled with mobility of households and firms, promotes a more efficient provision of services. By contrast, the more recent literature argues that decentralisation can increase corruption and government inefficiency, if local governments shield businesses operating in their jurisdiction from laws applying at the central level, thus effectively eroding the rule of law. Moreover, local governments may be more easily captured by special interests (Martinez-Vazquez and McNab, 2003).

The empirical evidence on the impact of decentralisation on growth is more ambiguous. A recent meta-analysis, based on 30 empirical studies, found that the evidence on the effect of decentralisation on growth is inconclusive (Baskaran et al., 2016). The failure to find clear-cut results partly reflects problems of measuring the autonomy of sub-federal jurisdictions accurately. Nonetheless, two recent OECD studies found that fiscal decentralisation (using various measures) was positively associated with GDP per capita (Blöchliger et al., 2013, 2017). Furthermore, the impact of decentralisation was found to be stronger for revenue than for spending decentralisation, and the main mechanism appears to be via government size.

Similar to the literature on growth, the theoretical and empirical literature provides no clear-cut answer on the link between fiscal decentralisation and inequality (Tselios, 2012). Fiscal decentralisation can reduce inequality. Decentralisation brings governments closer to their citizens, making local officials better informed about local needs than central governments. By contrast, fiscal decentralisation may lower the likelihood of attracting skilled officials as the supply of skills may be limited at the local level and, in turn, reducing the efficiency in delivering redistributive polices (Prud'homme, 1995). A recent OECD study provides ambiguous results on the association between fiscal decentralisation and inequality, with the results depending on the particular inequality and decentralisation measure considered in the analysis (Blöchliger, Bartolini and Stossberg, 2016).

Methodology

Following the recent literature on the effects of public policy, two main equations are estimated separately for economic growth and income inequality (Fournier and Johansson, 2016). The growth equation is based on the literature using the time series variation in the data to identify the long-run effects of public policy, such as Gemmell, Kneller and Sanz (2013) while the inequality equation follows Stossberg, Bartolini and Blöchliger (2016).

The growth equation

The effect of decentralisation on economic growth is estimated using a regression model derived from the neoclassical growth theory. Assuming a Cobb-Douglas technology and that the countries are operating in their steady state income level, Mankiw, Romer and Weil (1992) showed that the per capita GDP levels can be expressed as a linear function of the logarithm of the rate of savings and the rate of population growth. They further extended the analysis by adding the rate of investment to the human capital stock into the equation and provided evidence in favour of a better explanatory power of this extended model. Following this paper and the literature on convergence (Barro, 2015; Barro and Sala-i-Martin, 1992) the growth equation is formulated as

$$\begin{aligned}\Delta \ln y_{i,t} = \phi \ln y_{i,t-1} + \beta' X_{i,t-1} + \delta_1 \mathrm{GLOB}_{i,t-1} + \delta_2 \mathrm{GOVSIZE}_{i,t-1} + \delta_3' \mathrm{DEC}_{i,t-1} \\ + \theta_1' (\mathrm{GOVSIZE}_{i,t-1} * \mathrm{DEC}_{i,t-1}) + \theta_2 (\mathrm{GLOB}_{i,t-1} * \mathrm{GOVSIZE}_{i,t-1}) + \\ \theta_3' (\mathrm{GLOB}_{i,t-1} * \mathrm{DEC}_{i,t-1}) + \gamma' \Delta Z_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

where $y_{i,t}$ is per capita GDP level, $X_{i,t}$ is a vector of variables proxying the variables predicted by economic theory, namely, the logarithm of investment as a share of GDP, population growth and the growth rate of the human capital stock. As argued by Fournier and Johansson (2016), due to possible persistent imbalances, the investment rate is better linked to capital accumulation as compared with the savings rate. The human capital stock is measured by the average years of schooling of the working age population. The growth rate of this variable is used as a proxy for the rate of investment in the human capital stock.

The variables of interest, namely, $\mathrm{GLOB}_{i,t}$, $\mathrm{GOVSIZE}_{i,t}$ and $\mathrm{DEC}_{i,t}$ stand for a number of globalisation measures, government size and a vector of decentralisation ratios, respectively. As proxies of globalisation, several different variables are used. First is trade openness which is measured as international trade as a share of GDP and a population adjusted version of it. Second, total FDI flows and FDI inflows as share of GDP are used as alternative globalisation indicators. Finally, broader indicators constructed by Dreher (2006) are used. The main one is the aggregate globalisation indicator, called the KOF globalisation index, which has two sub-indices, political and social globalisation.

In addition to the policy variables appearing linearly in the equation, their products are used to control for the interactions among them. In this setting, the marginal effect of each

policy on the growth rate depends on the two other variables. For instance, the effect of decentralisation on economic growth is given by

$$\frac{\partial \Delta \ln y}{\partial \mathrm{DEC}} = \delta_3' + \theta_1' \,\mathrm{GOVSIZE} + \theta_3' \,\mathrm{GLOB}$$

The previous literature on the relationship between decentralisation and economic growth, such as Gemmell, Kneller and Sanz (2013) and Ligthart and Oudheusden (2017), assumed that the effect does not vary through time and across countries. The interaction terms introduced here allows the effect of decentralisation to be *heterogeneous*.

Equation (1) is flexible in the sense that it allows to distinguish between short-term or growth effects of policy and their long-term effects on the level of GDP per capita. It can also be written in an error-correction model (ECM) form as

$$\begin{aligned}\Delta \ln y_{i,t} = \phi[\ln y_{i,t-1} - \beta^{*\prime} X_{i,t-1} - \delta_1^* \mathrm{GLOB}_{i,t-1} - \delta_2^* \mathrm{GOVSIZE}_{i,t-1} - \delta_3^{*\prime} \mathrm{DEC}_{i,t-1} \\ -\theta_1^{*\prime}(\mathrm{GOVSIZE}_{i,t-1} * \mathrm{DEC}_{i,t-1}) - \theta_2^*(\mathrm{GLOB}_{i,t-1} * \mathrm{GOVSIZE}_{i,t-1}) \\ -\theta_3^{*\prime}(\mathrm{GLOB}_{i,t-1} * \mathrm{DEC}_{i,t-1})] + \gamma' \Delta Z_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t},\end{aligned} \quad (2)$$

where now the parameters of the policy variables measure explicitly the long-term effects.

The inequality equation

To measure the effect of decentralisation on household income inequality, a methodology similar to the one for economic growth is followed. Namely, the effect of decentralisation on the measures of inequality is allowed to be depending on other policy variables. The baseline estimation equation follows closely Stossberg, Bartolini and Blöchliger (2016), but it is extended to allow for interactive effects. This equation is given by

$$\begin{aligned}\ln \mathrm{INEQ}_{i,t} = \beta' X_{i,t} + \delta_1 \mathrm{GLOB}_{i,t} + \delta_2 \mathrm{GOVSIZE}_{i,t} + \delta_3' \mathrm{DEC}_{i,t} \\ +\theta_1'(\mathrm{GOVSIZE}_{i,t} * \mathrm{DEC}_{i,t}) + \theta_2(\mathrm{GLOB}_{i,t} * \mathrm{GOVSIZE}_{i,t}) + \theta_3'(\mathrm{GLOB}_{i,t} * \mathrm{DEC}_{i,t}) \\ + \mu_i + \lambda_t + \varepsilon_{i,t},\end{aligned} \quad (3)$$

where $\mathrm{INEQ}_{i,t}$ is a measure of income inequality and $X_{i,t}$ represents a vector of control variables while $\mathrm{GLOB}_{i,t}$, $\mathrm{GOVSIZE}_{i,t}$ and $\mathrm{DEC}_{i,t}$ are the policy variables as defined above. In the baseline model, the logarithmic difference between average disposable income of the 10th decile and the 1st decile is used as a general measure of income inequality, i.e. $\ln \mathrm{INEQ}_{i,t} = \ln \mathrm{HDI10}_{i,t} - \ln \mathrm{HDI1}_{i,t}$, where, HDI10 and HDI1 stand for average household disposable income levels of the 10th and 1st deciles, respectively. The vector of control variables, $X_{i,t}$, includes the variables which appear to be robustly affecting income inequality in the results reported by Stossberg, Bartolini and Blöchliger (2016). These are economic growth, the unemployment rate and urbanisation ratios.

Although this equation is informative and flexible, it has certain shortcomings. First, it relates the inequality indicator to stationary variables, hence, the specification is implicitly based on the assumption that the average income in different deciles do not diverge from each other in the long run. This assumption is equivalent to the hypothesis that average income in the 10th decile is cointegrated with the one in the 1st decile with a cointegration vector of (1, -1). In reality, this may or may not be true. Second, it shows the effects on the disparities between income deciles but it does not allow to distinguish between the effects of policy on income levels in different deciles.

An alternative method to study the effects of policy on income inequality is to use the level of income in different deciles or quintiles as dependent variable and relate this to a measure of average income. These alternative models are given by

$$\ln \mathrm{HDI}(\mu)_{i,t} = \beta_\mu \ln \mathrm{MHDI}_{i,t} + \delta_{1\mu}\mathrm{GLOB}_{i,t} + \delta_{2\mu}\mathrm{GOVSIZE}_{i,t} + \delta'_{3\mu}\mathrm{DEC}_{i,t} + \theta'_{1\mu}(\mathrm{GOVSIZE}_{i,t} * \mathrm{DEC}_{i,t}) + \theta_{2\mu}(\mathrm{GLOB}_{i,t} * \mathrm{GOVSIZE}_{i,t}) + \theta'_{3\mu}(\mathrm{GLOB}_{i,t} * \mathrm{DEC}_{i,t}) + \sum_{s=-k}^{k} \gamma_{s\mu}\Delta \ln \mathrm{MHDI}_{i,t-s} + \mu_{i\mu} + \lambda_{t\mu} + \varepsilon_{\mu i,t}, \quad (4)$$

where $\ln \mathrm{HDI}(\mu)_{i,t},\ \mu = 1,2,\dots,n$ are the average household disposable incomes in different deciles ($n = 10$) or quintiles ($n = 5$) and $\ln \mathrm{MHDI}_{i,t}$ is the average household disposable income. As both $\ln \mathrm{HDI}(\mu)_{i,t}$ and $\ln \mathrm{MHDI}_{i,t}$ are non-stationary variables this equation is intended to be a cointegration model with the cointegration vector of (1,-β). Therefore, the parameters of the variables of interest represent the effect of decentralisation on the relative gap between the average income and income in different levels. In the event of the cointegration vector being homogeneous across equations, i.e. $\beta_\mu = \beta$ for all $\mu = 1,2,\dots,n,$ by taking the differences 10th decile and the 1st decile, equation (3) is obtained. Hence, equation (3) can be seen as a special case of equation (4). Furthermore, using equation (4) it is possible to test the hypothesis that the elasticity of income level in different deciles with respect to average income is equal to one. Evidence against this hypothesis can be interpreted as an unequal distribution of growth dividends (Hermansen, Ruiz and Causa, 2016).[3]

Estimation strategy

To investigate the growth effects of decentralisation, equation (1) is estimated using the two-way fixed effects (2WFE) method. Although this equation focuses on the growth effects rather than the long-run coefficients, it has certain advantages over its alternatives, mainly the ECM formulation in equation (2) as it is linear in parameters and allows for separate identification of long run and short run effects.

The size of the sample used for estimation of the growth equation which contains up to 29 countries, dictates the employment of annual data instead of the common practice of taking period averages in the empirical growth literature. Though annual data provide a larger sample, there is the risk that transitory effects mask the relationships of interest. To control for these effects the first differences of the right hand side variables,$\Delta Z_{i,t}$, are added. Therefore, the parameters of the policy variables show the cumulative effects, or dynamic multipliers, after a year period. The non-linear variables in the equation make the choice of the variables to enter in the vector $\Delta Z_{i,t}$ important. To construct a dynamic non-linear model one possibility is to start with a, say, ARDL(1,1) model where the interaction terms appear in period *t* and *t-1*. However, in this case the dynamic multipliers of interest become a function of the variables in both *t* and *t-1* which complicates the interpretation of the model.[4] In general, the dynamic multipliers will be a function of the entire history of the other explanatory variables in the model. To avoid this complication, only the first differences of linear variables are used, $\Delta Z_{i,t} = (\Delta X_{i,t}, \Delta\mathrm{GLOB}_{i,t}, \Delta\mathrm{GOVSIZE}_{i,t}, \Delta\mathrm{DEC}_{i,t})$, which is, for instance, a strategy common in non-linear cointegration modelling (Choi and Saikkonen, 2010).

The estimation of the inequality equation given in (3) is less involved. As in the growth model, two-way fixed effects are added in the model to control for the unobserved country characteristics which are correlated with the right hand side variables and create persistent inequality effects. Year fixed effects capture the effects common to all countries.

Equation (4) is a co-integration equation, as both $\ln \mathrm{HDI}(\mu)_{i,t}$ and $\ln \mathrm{MHDI}_{i,t}$ are trending variables, extended with the stationary policy variables. The crucial property of the equation is the addition of up to k leads and lags of the nonstationary right hand side variables. Adding lags of the explanatory variable in the equation to control for endogeneity is standard in the 'ARDL approach to co-integration' which is sometimes called 'order-augmented ARDL' (Pesaran and Shin, 1998). However, in the case of a short-run feedback from the nonstationary dependent variable to the explanatory variables this approach fails to produce valid conditioning and the limiting distributions of the parameter estimates will suffer from bias, asymmetry and nuisance parameters (Phillips and Loreatan, 1991). In the present case the average household disposable income contains the income level in different deciles or quintiles as a component. Therefore, it is natural to expect a feedback relationship from the dependent variable to the right hand side. The solution to this feedback problem is to add the leads of the first differences of the explanatory variable in the estimation equation, a method suggested by and Stock and Watson (1993), among others.

Robustness

In the growth equation given in (1) both the vector $X_{i,t}$ and the policy variables are lagged for one period with respect to the dependent variable, but the first differences in the vector $\Delta Z_{i,t}$ are contemporaneously related to it. In two recent papers, Hauk and Wacziarg (2009) and Hauk (2017) argued that endogeneity may be a serious concern in empirical growth regressions and suggested that the between effects estimator (BE) is the least affected by the problem among a set of standard estimators. However, for at least two reasons BE does not fit in the current empirical set-up. First, as mentioned above, taking period averages reduce the number of observations dramatically. In the case of the BE, the number of available observations would be 29, the maximum number of countries in the dataset. Second, the BE produces an estimate of the parameter of the lagged dependent variable $\phi = 0$ as T goes to infinity, regardless of the true value (Maddala, 1971; Ditzen and Gundlach, 2016).

For these reasons, in addition to the baseline 2WFE estimations, a robustness check is conducted to deal with the possible endogeneity of using 2SLS estimators with lagged explanatory variables as instruments in both growth regressions (1) and inequality regressions (3).In the growth regressions $\Delta Z_{i,t}$ and in the inequality regressions all policy variables, their interactions and economic growth are instrumented with their lagged values of up to the third lag.

The choice between 2WFE and 2SLS estimators reflects the bias-variance trade off as the former is potentially biased and the second is potentially inefficient. For model selection, two diagnostic tests were used. First, the Sargan-Hansen test statistics (Hansen, 1982) is reported in its J-statistics form to check for the validity of the lagged instruments. Second, the difference-in-Sargan statistics is reported as a measure of the distance between the 2WFE and 2SLS estimates.

In all cases, the reported standard errors are robust to arbitrary heteroskedasticity and autocorrelation (HAC). To correct for heteroskedasticity each error term is allowed to have its own variance which is the most general option. An alternative would be to allow for heteroskedasticity only among panels. Although this would produce smaller variance estimates, under the condition that it is the true variance structure, in practice it may not be realistic. To correct for autocorrelation Newey and West (1987) estimates are reported using the Bartlett kernel with a bandwidth equal to 6.[5] Assuming auto-correlated standard

errors in the growth regression (1) may pose a problem as the model contains a lagged dependent variable. If the model is correctly specified, HAC standard errors will overestimate the variances in this model. However, if $\phi = 0$ as discussed above, non-HAC standard errors will underestimate them and inference on the growth effects of the policy variables will be invalid.

Data

Summary statistics of the variables used in this paper and data sources are shown in Annex Table 3.A1.1. For the growth regressions, potential GDP (per capita) is used as a dependent variable instead of actual GDP in order to avoid capturing cyclical relationships and focus on long-run effects, as in Bloch et la. (2016). In order to compute the per capita value, the trend population of the population between the ages of 15 and 75 is used. The growth of population also enters in the right hand side of the equation. These two variables and the investment rate come from the OECD *Economic Outlook database*. The data on average years of schooling are taken from the OECD Long-Term Scenarios database and the growth of this variable is used in the equation. Additional sources are shown in the Annex Table.

For the inequality regressions, data on disposable income levels at different income deciles are used, from the OECD project on multi-dimensional living standards (Boarini et al., 2016). This original database covers different measures of income, longevity and employment. In this paper, both levels of income at different deciles and a ratio measure of income inequality are computed from these variables, namely the logarithm of ratio of the average disposable income in the 10^{th} and 1^{st} decile. The latest year covered by the dataset is 2015 for all countries covered, and data availability ranges from 10 years for Korea to 42 years for the United States.

Three globalisation indicators are used in the empirical analysis. The first one is trade openness, defined as the sum of imports and exports divided by GDP, from the OECD Economic Outlook database. The second is the ratio of foreign direct investment flows from the World Development Indicators database. The third is a broader measure of globalisation, the KOF globalisation index compiled by Dreher (2006) and Dreher *et al*. (2008). This index covers several forms of globalisation, namely economic globalisation, social globalisation and political globalisation. We use a sub-index that covers the first two forms.

The data on decentralisation come from the OECD Fiscal Network's Decentralisation database. For comparability of the coefficients of the decentralisation variables with the government size coefficients, decentralisation is measured as local revenue or spending as a share of GDP. The main variables of interest are expenditure and revenue decentralisation. To see the effect of the way in which local expenditure are financed, intergovernmental transfer revenues are controlled for in additional estimates. The revenue decentralisation variable was also broken down into two parts, tax decentralisation and decentralisation of other revenues, with the latter being the difference between tax decentralisation and revenue decentralisation from the OECD Fiscal Network's Decentralisation database.

Results

In interpreting the results, we examine growth and inequality effects for spending and revenues in turn, through the channel of government size and globalisation. Given the multiple interactions in the equations and the complexity of interpreting all the interaction terms, we give the most weight to the marginal effects on inclusive growth. The detailed regression estimates for growth effects are shown in Table 3.A1.2, and for inequality in

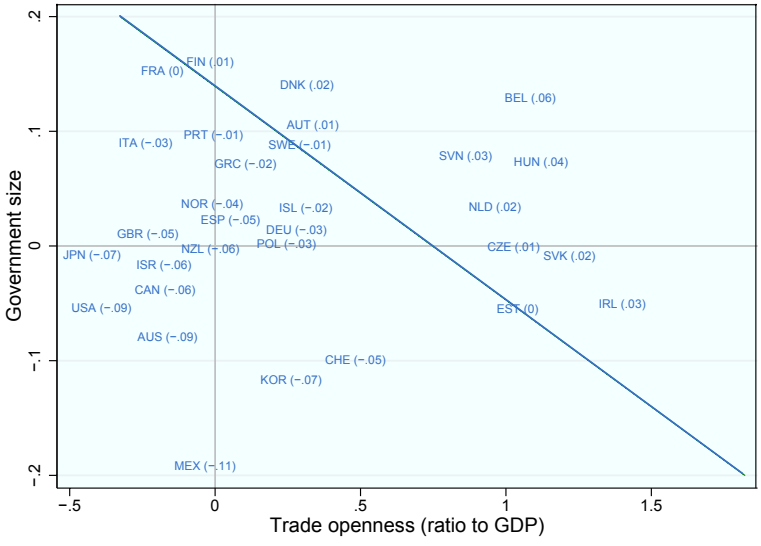
Table 3.A1.3. We start with an examination of the interactions and country-specific effects for each combination, followed by a summary of the cross-country results, conditional on the degree of globalisation. Note that globalisation as measured with trade openness is found to be most salient for identifying growth effects, while KOF-type globalisation index is found to be more useful in identifying inequality effects. In contrast, the foreign direct investment intensity index is not found to be a strong channel for identifying either growth or inequality effects.

Country-specific growth effects

The first set of results, for spending decentralisation on growth, illustrates the difficulty in drawing broad conclusions on the effects of fiscal decentralisation on growth. Figure 3.2, Panel A, shows that the marginal effects of spending decentralisation on growth vary dramatically across countries, not just in magnitude, but in sign as well. Given their current degree of decentralisation, slightly under half of countries could realise higher growth from a further decentralisation of their spending, while the remainder would benefit from a further *centralisation* of spending. Given the results across the two axes in Panel A, smaller and more open countries benefit the most in terms of growth from further decentralisation.

Figure 3.2. **Country-specific effects of spending decentralisation on economic growth**

A. Marginal effects on growth (in parenthesis)



B. Relevant estimation coefficients

Trade openness	0.010***	0.011***
	(0.0032)	(0.0030)
Government size	-0.031**	-0.036**
	(0.014)	(0.015)
Glob. x Gov. Size	-0.030*	-0.019
	(0.017)	(0.018)
Exp. Dec.	-0.048*	-0.053
	(0.027)	(0.034)
Intergov. Trans.		0.017
		(0.053)
T. Open. x Exp. Dec.	0.065***	0.087**
	(0.025)	(0.036)
T. Open. x Intergov. Trans.		-0.050
		(0.072)
Gov. Size x Exp. Dec.	0.35***	0.58***
	(0.11)	(0.16)
Gov. Size x Intergov. Trans.		-0.58**
		(0.24)
Observations	545	545
Country FE	YES	YES
Year FE	YES	YES
Partial R-squared	0.43	0.45

Source: For detailed results, see Table 3.A1.2.

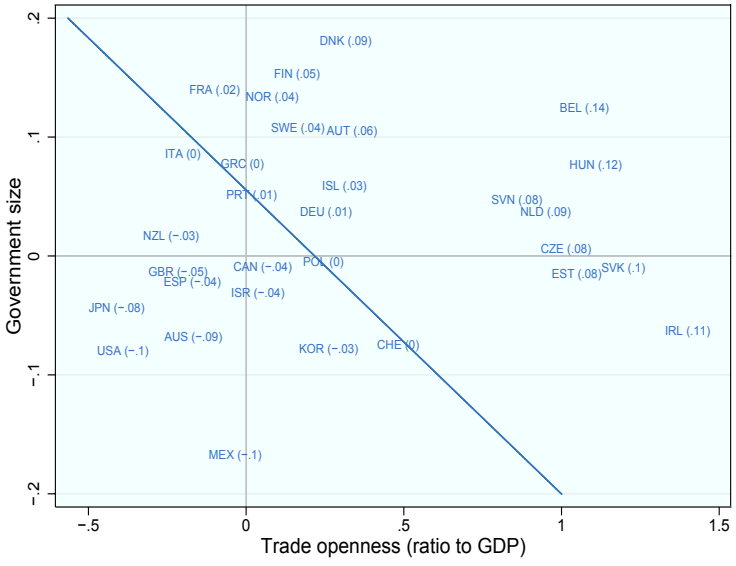
The distinctions among these marginal effects are primarily determined by the interaction terms between spending and government size plus trade openness. Figure 3.2, Panel B, shows the relevant coefficients from the estimation. Trade openness and government size have the expected (+ / -) signs, while the direct effect of spending decentralisation is negative, but this effect becomes insignificant once intergovernmental grants are included. The interaction term between trade openness and spending decentralisation is strongly positive, even more so with grants included, as with government size, comparable with what was found for decentralisation in the previous Chapter 2 by

Blöchliger and Akgun. For the effect on growth, this is even more evident when spending is own-source and not financed through intergovernmental transfers or grants. For those countries that are above the green line in Panel A, the size of the interaction effects of decentralisation with openness more than compensates for the overall negative direct effect of increasing government size on growth. Moreover, the positive effect of spending decentralisation on growth is enhanced the more globalised or open a country is.

The second set of results, for revenue decentralisation on growth, is broadly similar to that of spending. Figure 3.3, Panel A, shows again that the marginal effect of revenue decentralisation on growth varies dramatically across countries, not just in magnitude, but in sign as well. Given their current degree of decentralisation, slightly over half of countries could realise higher growth from a further decentralisation of their revenues, while the remainder would benefit from a further *centralisation* of spending. Given the results across the two axes in Panel A, again, smaller and more open countries benefit the most in terms of growth from further decentralisation.

Figure 3.3. **Country-specific effects of revenue decentralisation on economic growth**

A. Marginal effects on growth (in parenthesis)



B. Relevant estimation coefficients

Trade openness	0.011***	0.011***
	(0.0038)	(0.0035)
Government size	-0.031	-0.041*
	(0.023)	(0.023)
Glob. x Gov. size	-0.065**	-0.062**
	(0.031)	(0.031)
Rev. Dec.	-0.025	
	(0.048)	
Tax Dec.		-0.089*
		(0.051)
User fees		0.026
		(0.091)
T. Open. x Rev. Dec.	0.11***	
	(0.032)	
T. Open. x Tax Dec.		0.040
		(0.052)
T. Open. x User Fees		0.26**
		(0.10)
Gov. Size x Rev. Dec.	0.45*	
	(0.26)	
Gov. Size x Tax Dec.		0.85*
		(0.44)
Gov. Size x User Fees		-0.41
		(0.78)
Observations	545	543
Country, Year FE	YES	YES
Partial R-squared	0.38	0.40

Source: For detailed results, see Table 3.A1.2.

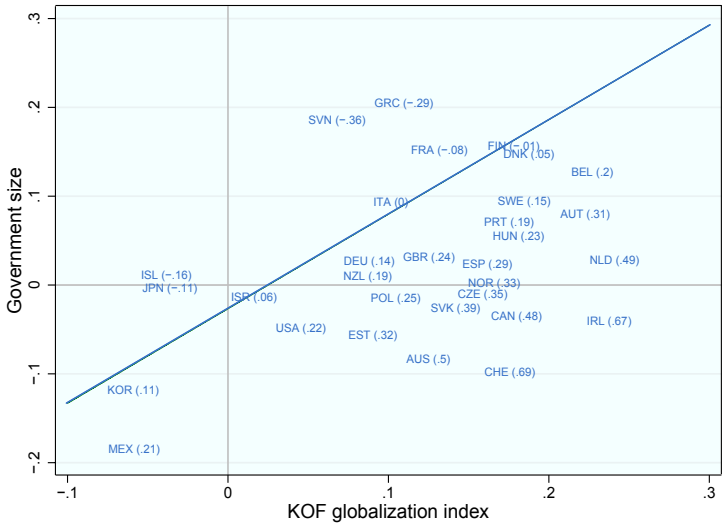
The distinctions among these marginal effects are primarily determined by the interaction terms between spending and government size plus trade openness. Figure 3.3, Panel B, shows the relevant coefficients from the estimation. Trade openness and government size have the expected (+ / -) signs, while the direct effect of tax revenue decentralisation is only significant (-) once user fees are included. The interaction term between trade openness and revenue decentralisation is strongly positive, but this is primarily driven by the effect of user fees; this is in contrast to the effect via government size, where the effect of tax revenue decentralisation is significantly positive, but driven by the effect of tax revenues rather than user fees. For those countries that are to the right of the green line in Panel A (also above it), the size of the interaction effects of revenue decentralisation with openness more than compensates for the overall negative direct effect of increasing government size on growth. Moreover, the positive effect of revenue decentralisation on growth is enhanced the more globalised or open is a country, and lowered the more closed it its.

Country-specific inequality effects

The third set of results, for spending decentralisation on inequality, contrasts from that for growth. Figure 3.4, Panel A, shows again that the marginal effect of spending decentralisation on inequality varies considerably across countries, in both magnitude and sign. Given their current degree of decentralisation, most countries would experience more inequality (a higher decile ratio) from a further decentralisation of their spending, while the remainder would realize *less* inequality from a further *centralisation* of spending. Given the results across the two axes in Panel A, larger and less globalised countries are best able to mitigate inequality through further spending decentralisation.

Figure 3.4. **Country-specific effects of spending decentralisation on inequality (decile ratio)**

A. Marginal effects on inequality (in parenthesis)



B. Relevant estimation coefficients

KOF	-0.0024	0.12
	(0.32)	(0.32)
Government size	-0.27	-0.42
	(0.41)	(0.41)
KOF x Gov. Size	-2.79	-1.21
	(2.13)	(2.11)
Exp. Dec.	-0.075	-2.66***
	(0.56)	(0.77)
Intergov. Trans.		6.16***
		(1.54)
KOF x Exp. Dec.	2.97	9.63**
	(3.07)	(4.34)
KOF x Intergov. Trans.		-24.1***
		(8.73)
Gov. Size x Exp. Dec.	-2.79	-1.09
	(2.00)	(2.54)
Gov. Size x Intergov. Trans.		-1.94
		(4.60)
Observations	498	498
Country, Year FE	YES	YES
Partial R-squared	0.11	0.19

Source: for detailed analytical results, see Table A3.

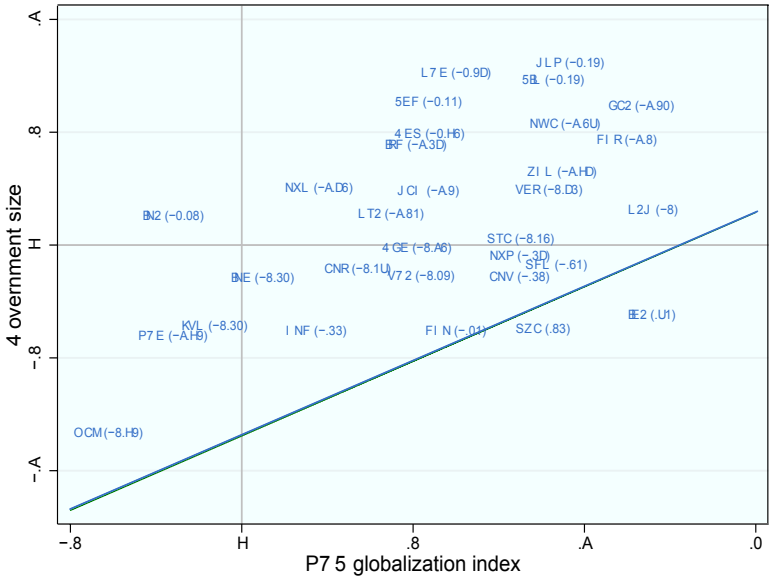
As with the growth regressions, in the inequality estimates, the distinctions among these marginal effects are primarily determined by the interaction terms between spending and government size plus "KOF-type" globalisation. Figure 3.4, Panel B, shows the most

relevant coefficients from the estimation. Neither KOF globalisation nor government size is significant in their direct effects on inequality; the direct effect of spending decentralisation is only significant once intergovernmental grants are controlled for, in which case spending decentralisation reduces inequality while grants increase it. However, the interaction effects for both types of decentralised spending have the opposite sign, and are larger: the interaction of globalisation with spending decentralisation increases inequality, while that of globalisation with intergovernmental grants decreases it, particularly strongly. The particularly large sign of the latter effect suggests that such grants are likely designed to mitigate inequality that results from globalisation, although they are not large enough to eliminate it. Neither type of spending has a significant interaction with government size in this specification. For those countries that are to the right of the green line in Panel A (also below it), the size of the positive interaction effect of spending decentralisation with globalisation overwhelms the direct negative effect of spending decentralisation on inequality, leading to a higher overall decile ratio. Moreover, the inequality-increasing effect of spending decentralisation is enhanced the more globalised is a country, and mitigated the less globalised it its.

The fourth set of results, for revenue decentralisation on inequality, amplifies the results for spending, and has stronger explanatory power. Figure 3.5, Panel A, shows that the marginal effect of revenue decentralisation on inequality varies considerably across countries, in both magnitude and sign, but this time much more negatively. Given their current degree of decentralisation, most countries would experience *less* inequality (a lower decile ratio) from a further decentralisation of their revenues, while the remaining few would realize more inequality from a further centralisation of revenues. Given the results across the two axes in Panel A, larger and less globalised countries tend to mitigate inequality through further revenue decentralisation, but there are far fewer trade-offs.

Figure 3.5. **Country-specific effects of revenue decentralisation on inequality**

A. Marginal effects on inequality (in parenthesis)



B. Relevant estimation coefficients

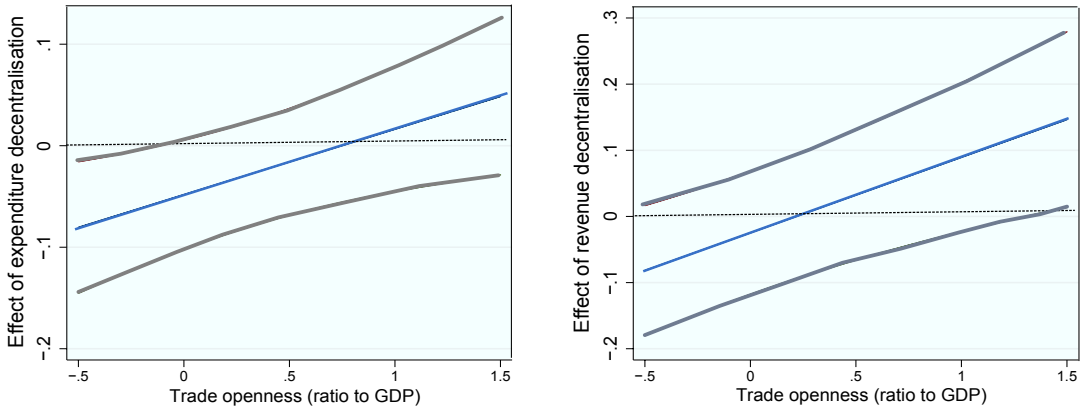
KOF	0.48	0.52
	(0.34)	(0.33)
Government size	-0.32	-0.41
	(0.50)	(0.46)
KOF x Gov. Size	-3.69	-3.63*
	(2.34)	(2.09)
Rev. Dec.	-2.78***	
	(0.76)	
Tax Dec.		-4.52***
		(1.01)
User Fees		1.01
		(1.68)
KOF x Rev. Dec.	10.8***	
	(3.99)	
KOF x Tax Dec.		14.6***
		(4.86)
KOF x User Fees		0.17
		(8.99)
Gov. Size x Rev. Dec.	-16.4***	
	(4.20)	
Gov. Size x Tax Dec.		-4.74
		(6.84)
Gov. Size x User Fees		-37.8***
		(13.1)
Observations	498	498
Country, Year FE	YES	YES
Partial R-squared	0.24	0.27

Source: For detailed results, see Table 3.A1.3.

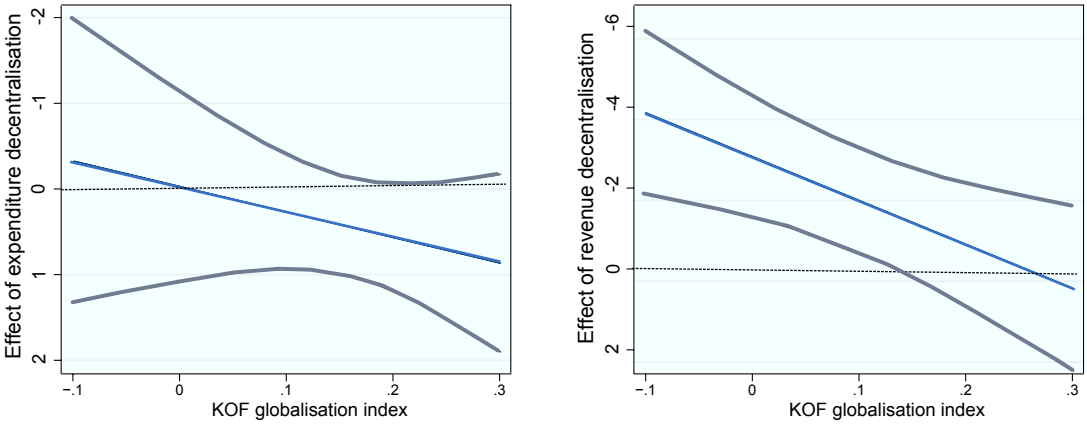
As with the previous regressions, the distinctions among these marginal effects are primarily determined by the interaction terms between revenues and government size plus globalisation. Figure 3.5, Panel B, shows the most relevant coefficients from the estimation. Again, neither KOF globalisation nor government size is significant in their direct effects on inequality; the direct effect of revenue decentralisation is less inequality, with tax revenues driving this effect (*i.e.*, after user fees are separated out). However, the interaction effects of decentralised revenues with both globalisation and government size have the opposite signs, and are larger. The interaction of globalisation with revenue decentralisation increases inequality, a result that is driven by tax revenues (strengthened once user fees are separated out). In contrast, the interaction of government size with revenue decentralisation decreases inequality, a result that is driven heavily by user fees (strengthened once tax revenues are separated out). For those countries that are to the left of/above the blue line in Panel A, the size of the negative interaction effect of revenue decentralisation with government size overwhelms the interaction with globalisation, leading to a lower decile ratio. While revenue decentralisation tends to lead to more inequality the more globalised is a country, the effect is quite modest, and the size of government is more important.

Figure 3.6. **Partial growth and inequality effects of decentralisation, as a function of globalisation**

A. Effect of decentralisation on growth (GDP per capita)



B. Effect of decentralisation on inequality (inverted 90/10 decile ratio)



Notes: Grey lines are 95% confidence intervals around the estimated elasticity (in blue).

Source: For detailed analytical results, see Annex Tables 3.A1.2 and 3.A1.3.

Overall interactions with globalisation

In order to more clearly illustrate how fiscal decentralisation is affected by globalisation in its results on growth and inequality ("inclusive growth"), the partial effects of decentralisation, conditional on the degree of trade openness, are calculated. The results for growth and inequality are shown in Figure 3.6. These effects implicitly hold government size fixed at the sample mean. As shown in Panel A (and described earlier), spending decentralisation is found to boost growth, for countries with a trade openness ratio above the sample average (the mean ratio is 0.7); revenue decentralisation boosts growth for more countries – well over half of the sample – and by a larger amount. For both spending and revenue, increasing decentralisation tends to be more growth-friendly (or at least less growth unfriendly).

For inequality, partial effects of decentralisation are shown in Figure 3.6, Panel B, conditional on the degree of KOF-type globalisation. Spending decentralisation is found to raise the decile ratio, for the sample average (mean KOF index of 0.7), once all interactions are taken into account, and more-so the more globalised is a country. On the other hand, revenue decentralisation tends to decrease the decile ratio, for most countries and more strongly, although less so the more globalised is a country.

Conclusion

Drawing upon new datasets on growth and inequality combined with fiscal decentralisation indicators, this chapter seeks to determine to what extent "inclusive growth" is realisable in a global economic context. Country specificities appear to matter a lot: some countries have already decentralised spending and revenues more than enough, and they would benefit from more centralisation. Other countries are excessively centralised given their fiscal profile, and these would benefit from more decentralisation. Spending and revenue decentralisation tend to boost economic growth for economies that have a relatively higher degree of trade openness, especially if spending is locally financed. On the other hand, fiscal decentralisation has a more ambiguous and potentially negative effect on inequality than on growth, especially for economies with a higher degree of globalisation. Yet, revenue decentralisation is more pro-equity than spending decentralisation in the typical economy's case. These results appear to be relatively robust, and hold up under a variety of empirical specifications, including with fixed effects and using techniques that seek to address potential endogeneity concerns.

What messages do these results hold for policymakers? The broad pro-growth decentralisation message of the previous chapter is conditioned by concerns about increased inequality, particularly in more globalised economies, where there may be trade-offs in achieving inclusive growth. More careful design of intergovernmental fiscal frameworks is necessary: as recommended in a regional context in Blöchliger et al. (2016), a two-pronged approach can be useful, through a rise in sub-national own-source revenue paired with a re-design of intergovernmental transfers and fiscal equalisation, in order to make all jurisdictions enjoy the benefits of more sub-central fiscal power.

Notes

1. Both authors are affiliated with the OECD Network on Fiscal Relations Across Levels of Government. Special thanks to Robin Boadway, Hansjoerg Blöchlinger, Peter Hoeller, Agnese Sacchi and Christine Wong for comments.

2. Accentuating this mechanism is the role of globalisation in strengthening discipline of sub-national governments' fiscal stances through increased market scrutiny over policies (de Mello, 2005).

3 The results obtained using this method are not reported here to save space. They are available from the authors upon request.

4. To see this suppose that the dynamic relation between a dependent variable y_{it} and two independent variables x_{1it} and x_{2it} is approximated by a simple ARDL(0,1) model as

$$y_{it} = \delta_{01}x_{1it} + \delta_{11}x_{1i,t-1} + \delta_{02}x_{2it} + \delta_{12}x_{2i,t-1} + \theta_{01}x_{1it}x_{2it} + \theta_{11}x_{1i,t-1}x_{2i,t-1}$$

Rearranging the terms to obtain the dynamic multipliers of the variables gives

$$y_{it} = \pi_{1it}x_{1it} + \pi_{2it}x_{2it} - \delta_{11}\Delta x_{1i,t} - \delta_{12}\Delta x_{2i,t} - \theta_{01}x_{1it}x_{2it} - \theta_{11}z_{it} + \varepsilon_{it}$$

where, $\pi_{1it} = \delta_{01} + \delta_{11} + \theta_{01}x_{2it} + \theta_{11}x_{2i,t-1}$, $\pi_{2it} = \delta_{02} + \delta_{12} + \theta_{01}x_{1it} + \theta_{11}x_{1i,t-1}$, and, $z_{it} = x_{1i,t}x_{2i,t-1} + x_{1i,t-1}x_{2i,t} - x_{1i,t-1}x_{2i,t-1}$.

5. The same bandwidth is used by Kao, Chiang and Chen (1999) in a similarly-sized sample.

References

Alesina, A. and E. Spolaore (1997), "On the Number and Size of Nations", *Quarterly Journal of Economics*, 112(4): 1027–56.

Alesina, A. and Wacziarg, R. (1998), "Openness, country size and government", *Journal of Public Economics*, 69(3): 305–321.

Alesina, A. (2003), "The Size of Countries: Does It Matter?", *Journal of the European Economic Association*, Vol. 1, pp. 301-316.

Alesina, A., E. Spolaore, and R. Wacziarg (2005) "Trade, Growth and the Size of Countries", in *Handbook of Economic Growth*, P. Aghion and S. Durlauf (eds), pp. 1499-1542: North Holland, Amsterdam.

Barro, R. J. (2015), "Convergence and Modernisation", *The Economic Journal*, Vol. 125, pp. 911-942.

Barro, R. J. and X. Sala-i-Martin (1992), "Convergence" *Journal of Political Economy*, *100*(2), 223-251.

Banerjee, A., J.J. Dolado, D.F. Hendry, and G.W. Smith (1986), "Exploring equilibrium relationships in econometrics through static models: some Monte Carlo evidence", *Oxford Bulletin of Economics and statistics*, *48*(3), 253-277.

Baskaran, T., L. P. Feld and J. Schnellenbach (2016), "Fiscal Federalism, Decentralization, and Economic Growth: A Meta-Analysis", *Economic Inquiry,* Vol. 54.

Boadway, R. and S. Dougherty (2018), "Decentralisation in a Globalised world", OECD Working Papers on Fiscal Federalism, No. 21, OECD Publishing, Paris, https://doi.org/10.1787/22265848

Boarini, R., F. Murtin, P. Schreyer and M. Fleurbaey (2016), "Multi-dimensional Living Standards: A Welfare Measure Based on Preferences", *OECD Statistics Working Papers*, No. 2016/05.

Brys, B., S. Perret, A. Thomas and P. O'Reilly (2016), "Tax Design for Inclusive Economic Growth", *OECD Taxation Working Papers*, No. 26.

Choi, I. and P. Saikkonen, P. (2010), "Tests for nonlinear cointegration", *Econometric Theory*, *26*(3), 682-709.

Cournede et al. (2017), "The Quality of Public Finance and Inclusive Growth", OECD, forthcoming.

Ditzen, J. and E. Gundlach, E. (2016), "A Monte Carlo study of the BE estimator for growth regressions", *Empirical Economics*, *51*(1), 31-55.

Dreher, A. (2006), "Does globalization affect growth? Evidence from a new index of globalization", *Applied Economics*, *38*(10), 1091-1110.

Dreher, A., N. Gaston, and P. Martens, P. (2008), *Measuring globalisation: Gauging its consequences*, Springer Science & Business Media.

Feler, L. and M. Senses (2017), "Trade Shocks and the Provision of Local Public Goods", *American Economic Journal: Economic Policy, 9*(4): 101-143.

Fournier, J.M. and Å. Johansson (2016), "The Effect of the Size and Mix of Public Spending on Growth and Inequality", *OECD Economics Department Working Papers*, No. 1344.

Garrett, G. and J. Rodden (2006), "Globalization and Fiscal Decentralization", in D. Cameron, G. Ranis and A. Zinn (eds.), *Globalization and Self-Determination: Is the Nation-State Under Siege?*, Routledge: London and New York.

Gemmell, N., R. Kneller and I. Sanz, I. (2013), "Fiscal decentralization and economic growth: spending versus revenue decentralization" *Economic Inquiry*, *51*(4), 1915-1931.

Granger, C.W. and P. Newbold (1974), "Spurious regressions in econometrics", *Journal of Econometrics*, *2*(2), 111-120.

Hansen, L. P. (1982), "Large sample properties of generalized method of moments estimators", *Econometrica: Journal of the Econometric Society*, 1029-1054.

Hauk, W. R. (2017), "Endogeneity bias and growth regressions", *Journal of Macroeconomics*, *51*, 143-161.

Hauk, W. R. and R. Wacziarg, R. (2009), "A Monte Carlo study of growth regressions", *Journal of Economic Growth*, *14*(2), 103-147.

Hermansen, M., N. Ruiz and O. Causa (2016), "The Distribution of the Growth Dividends", *OECD Economics Department Working Paper*, No. 1343, OECD Publishing, Paris.

Islam, N. (1995)", "Growth empirics: a panel data approach", *The Quarterly Journal of Economics*, *110*(4), 1127-1170.

Kao, C. (1999), "Spurious regression and residual-based tests for cointegration in panel data", *Journal of Econometrics*, *90*(1), 1-44.

Kao, C., M. H. Chiang, and B. Chen (1999), "International R&D spillovers: an application of estimation and inference in panel cointegration", *Oxford Bulletin of Economics and statistics*, *61*(S1), 691-709.

Ligthart, J. E. and P. Oudheusden (2017), "The Fiscal Decentralisation and Economic Growth Nexus Revisited", *Fiscal Studies*, *38*(1), 141-171.

Maddala, G. S. (1971), "The use of variance components models in pooling cross section and time series data", *Econometrica: Journal of the Econometric Society*, *39*(2), 341-358.

Mankiw, G.N., D. Romer and D. N. Weil (1992), "A Contribution to the Empirics of Economic Growth", *Quarterly Journal of Economics*, 107(2), 407–437.

de Mello, L. (2005), "Globalisation and Fiscal Federalism: Does Openness Constrain Subnational Budget Imbalances?", *Public Budgeting & Finance*, Spring.

Newey, W. K. and K.D. West (1987), "A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix", *Econometrica: Journal of the Econometric Society*, 703-708.

Oates, W.E. (1972), *Fiscal Federalism*, Harcourt Brace Jovanovich.

OECD/Korea Institute of Public Finance (KIPF) (2013), *Measuring Fiscal Decentralisation: Concepts and Policies*, OECD Fiscal Federalism Studies, OECD, Paris.

OECD/KIPF (2016), *Fiscal Federalism 2016: Making Decentralisation Work*, OECD Publishing, Paris.

OECD (2017), "How to Make Trade Work for All", in *OECD Economic Outlook*, Vol. 2017/1, Paris.

Pesaran, M. H. (1997), "The role of economic theory in modelling the long run", *The Economic Journal*, *107*(440), 178-191.

Phillips, P. C. and H.R. Moon (1999), "Linear regression limit theory for nonstationary panel data", *Econometrica*, *67*(5), 1057-1111.

Phillips, P. C. and J.Y. Park (1988), "Asymptotic equivalence of ordinary least squares and generalized least squares in regressions with integrated regressors", *Journal of the American Statistical Association*, *83*(401), 111-115.

Rodrick, D. (1998), "Why Do More Open Economies Have Bigger Governments?," *Journal of Political Economy*, Vol. 106, No. 5, pp. 997-1032.

Stock, J. H. and M.W. Watson (1993), "A simple estimator of cointegrating vectors in higher order integrated systems", *Econometrica: Journal of the Econometric Society*, 783-820.

Stossberg, S., D. Bartolini, and H. Blöchliger, H. (2016), "Fiscal decentralisation and income inequality: Empirical evidence from OECD countries", *OECD Economic Department Working Papers*, No. 1331, OECD Publishing, Paris.

Tiebout, C. (1956), "A Pure Theory of Local Expenditures", *Journal of Political Economy*, Vol. 64, No. 5.

Weingast, B. (1995), "The Economic Role of Political Institutions: Market-Preserving Federalism and Economic Development," *Journal of Law, Economics, & Organization*, Vol. 20.

Annex 3.A1

Table 3.A1.1 **Summary statistics of the main dataset**

Variable	Unit	Description	N	Mean	S.D.	Min.	Max.	Source
Income								
Δ ln(GDPPC)	Percentage point	Growth of potential GDP per capita	959	0.02	0.01	-0.01	0.08	Economic Outlook No. 99
ln(GDPPC)	Logarithm	Log. of potential GDP per capita	993	10.56	0.37	8.97	11.69	Economic Outlook No. 99
ln(MHDI)	Logarithm	Average household disposable income	866	9.89	0.34	8.85	10.66	Boarini et al. (2016)
ln(HDIQ1)	Logarithm	Average HDI in first quintile	866	8.95	0.48	7.18	9.73	Boarini et al. (2016)
ln(HDIQ2)	Logarithm	Average HDI in second quintile	866	9.46	0.42	7.87	10.22	Boarini et al. (2016)
ln(HDIQ3)	Logarithm	Average HDI in third quintile	866	9.74	0.39	8.31	10.44	Boarini et al. (2016)
ln(HDIQ4)	Logarithm	Average HDI in forth quintile	866	10.02	0.36	8.81	10.80	Boarini et al. (2016)
ln(HDIQ5)	Logarithm	Average HDI in fifth quintile	866	10.55	0.31	9.71	11.46	Boarini et al. (2016)
ln(INEQ)	Logarithm	Log. diff. of avg. HDI in 10th and 1st deciles	866	2.08	0.46	1.26	3.51	Boarini et al. (2016)
Government								
GOVEXP	Percentage point	Total government expenditure (ratio to GDP)	1206	0.43	0.09	0.19	0.69	OECD Revenue Statistics
GOVREV	Percentage point	Total government revenue (ratio to GDP)	1230	0.40	0.09	0.17	0.60	OECD Revenue Statistics
EXPDEC	Percentage point	Expenditure decentralisation (ratio to GDP)	607	0.14	0.07	0.03	0.35	OECD Fiscal Dec. Database
TRREV	Percentage point	Inter-governmental transfer rev. (ratio to GDP)	607	0.06	0.04	0.00	0.21	OECD Fiscal Dec. Database
REVDEC	Percentage point	Revenue decentralisation (ratio to GDP)	607	0.09	0.06	0.01	0.23	OECD Fiscal Dec. Database
TAXDEC	Percentage point	Tax decentralisation (ratio to GDP)	1 233	0.05	0.04	0.00	0.17	OECD Fiscal Dec. Database
OTHRDEC	Percentage point	Decentralisation of other revenue (ratio to GDP)	602	0.03	0.02	-0.04	0.08	OECD Fiscal Dec. Database
Globalisation								
OPEN	Percentage point	Total international trade (ratio to GDP)	1 573	0.69	0.46	0.07	3.74	Economic Outlook No. 99
FDI	Percentage point	Total FDI flows (ratio to GDP)	1 250	0.06	0.18	-0.36	4.16	World Development Indicators
KOF	Percentage point	KOF globalisation index	1 408	0.69	0.15	0.25	0.93	Dreher (2006); Dreher et. al (2008)
Control variables								
ln(INV)	Logarithm	Log. investment rate	1 611	-1.45	0.18	-2.15	-0.93	Economic Outlook No. 99
ln(MYS)	Logarithm	Log. mean years of schooling	1 938	2.23	0.33	0.56	2.63	OECD Long Term Database
POPGR	Percentage point	Population growth	1 724	0.01	0.01	-0.01	0.04	Economic Outlook No. 99
UNEMP	Percentage point	Unemployment rate	1 149	0.07	0.04	0.01	0.28	Economic Outlook No. 99
URBAN	Percentage point	Urbanisation ratio	1 904	0.71	0.14	0.28	0.98	World Development Indicators

Table 3.A1.2 **Results on growth (GDP per capita)**

	Trade openness				FDI flows				KOF globalisation			
Globalisation indicator	0.010***	0.011***	0.011***	0.011***	0.0028	0.012**	-0.0024	-0.0013	0.050**	0.044**	0.032	0.042**
	(0.0032)	(0.0030)	(0.0038)	(0.0035)	(0.0042)	(0.0051)	(0.0063)	(0.0059)	(0.021)	(0.021)	(0.023)	(0.021)
Government size	-0.031**	-0.036**	-0.031	-0.041*	-0.051***	-0.054***	-0.043**	-0.055***	-0.044***	-0.048***	-0.057**	-0.071***
	(0.014)	(0.015)	(0.023)	(0.023)	(0.012)	(0.012)	(0.021)	(0.020)	(0.017)	(0.017)	(0.027)	(0.025)
Globalisation x gov't size	-0.030*	-0.019	-0.065**	-0.062**	-0.0020	0.0012	0.12*	0.095	-0.061	-0.033	0.16	0.16
	(0.017)	(0.018)	(0.031)	(0.031)	(0.049)	(0.047)	(0.066)	(0.065)	(0.12)	(0.13)	(0.16)	(0.15)
Expenditure decen.	-0.048*	-0.053			-0.018	-0.040			-0.021	-0.041		
	(0.027)	(0.034)			(0.026)	(0.036)			(0.035)	(0.049)		
Intergov't transfers		0.017				0.038				0.032		
		(0.053)				(0.048)				(0.078)		
Revenue decen.			-0.025				-0.023				0.014	
			(0.048)				(0.046)				(0.059)	
Tax decen.				-0.089*				-0.067				0.019
				(0.051)				(0.048)				(0.075)
User fees				0.026				0.073				-0.069
				(0.091)				(0.093)				(0.13)
Globalisation x exp. decen.	0.065***	0.087**			0.046	0.30***			-0.0094	0.045		
	(0.025))	(0.036)			(0.038)	(0.094)			(0.15)	(0.22)		
Glob. x intergov. transfers		-0.050				-0.49***				-0.14		
		(0.072)				(0.14)				(0.39)		
Glob. x revenue decen.			0.11***				0.100				-0.18	
			(0.032)				(0.078)				(0.21)	
Glob. x tax decen.				0.040				0.16				-0.68**
				(0.052)				(0.11)				(0.30)
Glob. x user fees				0.26**				-0.021				1.32**
				(0.10)				(0.12)				(0.65)
Gov't size x exp. decen.	0.35***	0.58***			0.37***	0.64***			0.36***	0.54***		
	(0.11)	(0.16)			(0.11)	(0.14)			(0.11)	(0.14)		
Gov't size x intergov. trans.		-0.58**				-0.75***				-0.52**		
		(0.24)				(0.21)				(0.21)		
Gov't size x rev. decen.			0.45*				0.68***				0.46*	
			(0.26)				(0.24)				(0.27)	

Table 3.A1.2 **Results on growth (GDP per capita)** *(cont.)*

	Trade openness					FDI flows				KOF globalisation			
Gov't size x tax decen.				0.85*				0.92**				0.79*
				(0.44)				(0.39)				(0.42)
Gov't size x user fees				-0.41				0.027				-0.73
				(0.78)				(0.77)				(0.80)
Observations	545	545	545	543	530	530	530	528	518	518	518	518
Country, Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Partial R-squared	0.43	0.45	0.38	0.40	0.39	0.43	0.35	0.35	0.42	0.44	0.36	0.39

Table 3.A1.3 **Results on inequality (decile ratio)**

	Trade openness				FDI flows				KOF globalisation			
Globalisation indicator	-0.18***	-0.16***	-0.13*	-0.11	0.038	0.073**	0.081*	0.067*	-0.0024	0.12	0.48	0.52
	(0.062)	(0.062)	(0.071)	(0.072)	(0.031)	(0.035)	(0.043)	(0.037)	(0.32)	(0.32)	(0.34)	(0.33)
Government size	-0.70**	-0.64**	-0.79**	-0.87***	-0.57**	-0.46*	-0.81***	-0.92***	-0.27	-0.42	-0.32	-0.41
	(0.31)	(0.32)	(0.33)	(0.33)	(0.24)	(0.25)	(0.31)	(0.30)	(0.41)	(0.41)	(0.50)	(0.46)
Globalisation x gov't size	-0.100	-0.046	0.085	0.20	-1.24*	-1.17*	-0.70	-0.85*	-2.79	-1.21	-3.69	-3.63*
	(0.36)	(0.32)	(0.60)	(0.59)	(0.65)	(0.61)	(0.48)	(0.48)	(2.13)	(2.11)	(2.34)	(2.09)
Expenditure decen.	0.22	-1.55**			0.55*	-0.75			-0.075	-2.66***		
	(0.43)	(0.69)			(0.29)	(0.58)			(0.56)	(0.77)		
Intergov't transfers		3.52***				2.01***				6.16***		
		(1.15)				(0.66)				(1.54)		
Revenue decen.			-1.44**				-0.48				-2.78***	
			(0.66)				(0.60)				(0.76)	
Tax decen.				-2.28***				-1.53**				-4.52***
				(0.74)				(0.60)				(1.01)
User fees				1.09				1.74				1.01
				(1.21)				(1.07)				(1.68)
Globalisation x exp. decen.	-0.39	-0.87			0.27	0.85			2.97	9.63**		
	(0.59)	(0.72)			(0.59)	(0.74)			(3.07)	(4.34)		
Glob. x intergov. transfers		-0.65				-1.31				-24.1***		
		(1.47)				(0.94)				(8.73)		
Glob. x revenue decen.			-0.16				1.88**				10.8***	
			(0.76)				(0.81)				(3.99)	
Glob. x tax decen.				0.14				1.86**				14.6***
				(1.04)				(0.86)				(4.86)
Glob. x user fees				-1.59				1.12				0.17
				(1.31)				(2.09)				(8.99)
Gov't size x exp. decen.	-2.69	-1.39			-2.60	-1.61			-2.79	-1.09		
	(2.21)	(2.68)			(1.88)	(2.43)			(2.00)	(2.54)		
Gov't size x intergov. trans.		-3.10				-2.11				-1.94		
		(4.69)				(4.05)				(4.60)		
Gov't size x rev. decen.			-12.6***				-12.8***				-16.4***	
			(4.06)				(3.72)				(4.20)	

Table 3.A1.3 **Results on inequality (decile ratio)** *(cont.)*

	Trade openness				FDI flows				KOF globalisation			
Gov't size x tax decen.				-3.86				-3.37				-4.74
				(6.37)				(5.79)				(6.84)
Gov't size x user fees				-31.8***				-32.1***				-37.8***
				(11.4)				(11.3)				(13.1)
Observations	523	523	523	521	515	515	515	513	498	498	498	498
Country, Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Partial R-squared	0.13	0.20	0.21	0.24	0.14	0.17	0.19	0.22	0.11	0.19	0.24	0.27

Chapter 4

The effects of central-government transfers to states in India

by
M. Govinda Rao*

India has witnessed an impressive growth performance since the market-based reforms were introduced in 1991. However, its regional spread has been uneven. Considering the fact that over 63% of the population lives in economically lagging states and they have over 67% of children in the age group 0-14 demographic dividends can only be realised when a system of intergovernmental transfers is designed to offset their fiscal shortfalls. The present paper analyses the design and implementation of general and specific purpose transfers in India. The general purpose transfers are given to enable the states to provide comparable levels of services at comparable tax rates. However, given the large differences in the revenue-raising capacities of the states with the richest large states having five times the per capita income of the lowest, it is politically infeasible to offset the differences in revenue-raising capacities completely. Therefore, the specific purpose grants which are meant to ensure minimum standards of meritorious services with strong externalities are extremely important. However, the analysis shows that there are too many specific purpose transfers, they are poorly targeted and inclusion of multiple objectives in each of the specific purpose transfers makes the compliance by the states difficult. Inclusive development requires a reform of the transfer system.

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Introduction

Indian economic growth has been accelerating steadily, from nearly 3.5% per year during 1950-80 to 5.8% during 1980-2000, and further to 7.4% since 2001-02. Although after the global financial crisis in 2008 there was some deceleration, the Indian economy turned around swiftly and is presently one of the fastest growing countries. Nevertheless, most observers consider this growth to be well below India's potential and that further reforms to liberalise the economy would accelerate its growth further.

Despite India's impressive growth performance, its regional spread has been uneven; as some of its low-income states have been trying to catch up with their more advanced counterparts, inter-state disparities have increased, particularly following the market-based reforms initiated in 1991. The states with better physical and social infrastructure and market-friendly governance institutions have been able to grow faster (Panagariya, Chakraborty and Rao, 2015). This has led to significant divergence of incomes among the states, with a coefficient of variation in per capita incomes increasing from 0.33 in 1991-92 to 0.47 in 200-01 and to 0.40 in 2014-15. Ironically, most of the low-income states are resource-rich, which implies that physical and social infrastructure has been a binding constraint in their development (Rao and Mandal, 2009).

It is essential to accelerate growth and development in India's low-income states, for reasons of both inclusiveness and the stability of the Indian federation. An overwhelming proportion of the poor are concentrated in low-income states; therefore, accelerating growth in these states is an essential prerequisite to lift them out of the poverty trap. Overall, India has a working-age population (15-64 years) of 63.4%. Low-income states have a staggered demographic profile, however: the high proportion of the working-age population will continue to fluctuate for a longer period. As the school-age population (6-13 years) is higher in these states, their need for public spending on services like healthcare and education is more substantial.

Regional differences in social and physical infrastructures can be reduced through either regional policies or intergovernmental transfers. In a small country, the central government can identify the diverse needs for public services and make investments in different states to achieve the required regional balance. However, in a large, diverse federation, this has to be mainly achieved through intergovernmental transfers - as the lower level jurisdictions are better placed to know the diverse preferences of the people and provide public services accordingly. In almost all large and diversified federations, therefore, reducing regional differences in social and physical infrastructure has to be achieved through intergovernmental transfers (Ahmad, 1997).

The rationale for intergovernmental transfers is to offset the revenue and cost differences of the states. The assignment of functions and sources of finance according to comparative advantage results in vertical fiscal imbalances (Rao, 2009). While intergovernmental transfers to reduce imbalances are unavoidable, it is crucial to avoid perverse incentives from such transfers. It is also important to match the revenue and expenditure decisions at the margin for sub-national governments for reasons of efficiency and accountability. An efficient system of tax assignment provides tax powers to sub-national levels up to the point where the marginal efficiency loss due to tax differences is matched with marginal efficiency gains from fiscal autonomy.

In addition to vertical fiscal imbalances, horizontal imbalances arise from differences in the ability to raise revenues and the unit costs of providing public services. Horizontal equity is violated when there are differences in revenue and cost differences across states (Buchanan, 1950). The problem is exacerbated when there are origin-based taxes, and

similar other factors alter the net fiscal benefits in different sub-national jurisdictions (Boadway and Flatters, 1982). In mature market economies, fiscal differentials can, to some extent, be equalised through population mobility. However, in countries like India with several institutional impediments to mobility, fiscal differences have to be offset through intergovernmental transfers. Such transfers have to be unconditional – to *enable* every state to provide a standard level of public service at a normative tax rate.

There is also a case for transfers to ensure that people, irrespective of the jurisdiction they live in receive prescribed minimum standards of meritorious public services and those services with a high degree of spillovers, such as education, healthcare, water supply and sanitation, and anti-poverty interventions. Such transfers have to be purpose-specific but linked to providing the specified minimum standards. The states may be asked to make matching contributions to avoid substituting these transfers to own expenditures. When the existing inter-state differences in such meritorious services are large, it is also possible to design the transfer system with varying matching requirements (Feldstein, 1975).

This chapter analyses the effectiveness of intergovernmental transfers in providing public services to achieve balanced regional development in India. The next section describes the federal fiscal arrangements and transfer system in India. The third section analyses the equity and efficiency issues relating to the Indian fiscal transfer system. The fourth section examines three important specific-purpose transfers relating to elementary education, healthcare and anti-poverty interventions to identify the design and implementation problems of these transfers. Concluding remarks are presented in the final section.

The Indian federal fiscal system and institutions

The Indian constitution describes India as a "union of states" and a "sovereign, secular, socialist, democratic republic". It is the largest democratic federal republic, inhabited by 1.3 billion people, spread over 29 states and 7 union territories, covering an area of 3.29 million square kilometres. India is a developing country federation with an average per capita gross domestic product (GDP) (purchasing power parity [PPP]) of USD 5 855 (2015). A distinguishing feature of the Indian economy is its marked diversity. People of several races and religions, who speak 114 languages (18 of which are "scheduled" or official), coexist peacefully, bonded together by way of their shared history and culture. The country is predominantly rural; according to the 2011 census, 55.5% of the population lives in rural areas.

India has a three-tier federal structure with governments at union, state and local levels. There are 29 states and 7 centrally administered territories – 2 with their own legislatures. Below the state governments, in urban areas, there are 96 municipal corporations, 1 494 municipalities and 2 092 smaller municipalities (called *Nagar Panchayats*). There are 247 033 rural local bodies or *panchayats*, of which 515 are at the district level, 5 930 at the block level, and 240 588 at the village level. However, the devolution of powers by the states to the third level is rare, and their participation in public service delivery is negligible.

There are wide variations in the size and economic structure among the states. In 2011, Uttar Pradesh, with 200 million people was the largest state; and Sikkim, with 0.6 million, was the smallest. The per capita gross state domestic product (GSDP) in 2014-15, at INR 165 728 (USD 2 550) was the highest in Haryana (excluding the small state of Goa on the west coast, which had a higher per capita GSDP of INR 304 666), and the lowest in Bihar, at INR 33 954 (USD 522), the second largest state in the Gangetic Plains in northern India.

Due to their small size, low economic base, and strategic location, the 11 small, mountainous states are categorised as "special category states" (SCS).

With most broad-based taxes assigned to the union government, and states given the primary responsibility of providing social services, and co-equal responsibility for providing economic services, there is a significant vertical fiscal imbalance. Wide variations in the levels of development among the states, with the per capita GSDP in the most affluent state at over five times that of the least developed, there is a considerable horizontal imbalance as well. The market-oriented reforms embarked upon in 2010 have further accentuated the horizontal imbalance. Although these reforms have helped to free the economy from excessive government controls, resulting in an acceleration in economic growth and reduction in poverty, the vestiges of the planned era have continued as far as fiscal decentralisation is concerned (Rao, 2010).

The Constitution's founding fathers were conscious of the need to resolve such imbalances and provided for the appointment of a finance commission every five years to share central taxes with the states and give them grants. However, with the adoption of planned development and the appointment of the Planning Commission in 1951 through a cabinet resolution, the Planning Commission intruded into the domain of the Finance Commission by giving grants for planning purposes. The Finance Commission was confined to meet only the non-plan requirements of the states.

Table 4.1 presents the central and state governments' shares in revenue and expenditures. The total revenue collected in the country is about 20.5% of GDP and of this, 37.5% is raised by the states. The states, however, incur over 60% of total public expenditures, amounting to 27% of GDP. Thus, the states' total expenditure is 18.3% of GDP, of which they raise about 8% of GDP from their own sources and receive transfers amounting to about 7% of GDP. The remaining expenditure is financed from borrowing.

Table 4.1. **India: States' shares in revenue and expenditures**

Years	Total revenue (Union + states)	Total expenditure (Union + states)	States' share in revenue			States' share in expenditures		
	% of GDP	% of GDP	Tax revenue	Non-tax revenue	Total revenue	Current expenditure	Capital expenditure	Total expenditure
1990-91	17.4	26.7	34.4	44.9	35.9	55.2	44.5	53.6
2000-01	16.7	25.8	38.2	40.8	39.1	56.0	57.0	56.5
2005-06	18.9	24.9	37.7	34.7	36.8	55.2	59.4	56.7
2007-08	20.2	24.4	31.9	38.5	32.9	53.5	53.1	54.7
2008-09	18.7	25.7	33.9	40.5	34.7	49.3	64.2	53.8
2009-10	18.2	27.2	37.6	39.6	37.5	51.2	61.5	54.3
2010-11	19.9	26.4	37.6	23.8	35.0	51.3	53.7	53.1
2011-12	18.4	26.8	38.9	38.3	34.0	53.7	60.9	55.8
2012-13	19.1	26.1	39.2	40.8	39.0	54.9	59.6	54.9
2013-14	20.4	27.6	40.3	35.7	37.3	56.0	62.4	56.9
2014-15	20.5	27.3	39.0	37.3	37.3	62.2	56.9	60.7

Source: Public Finance Statistics, Ministry of Finance, Government of India, relevant years; Finance Accounts of Central and State Governments, Comptroller and Auditor General, Government of India.

There is considerable variation among the states with regard to their fiscal dependence on the union government. There are 18 relatively homogenous general category states (GCS), but even these have vast differences in size, revenue-raising capacities and efforts, expenditure levels, and fiscal dependence on the union government. In addition, in terms of economic characteristics, the 11 mountainous states in the north and northeast differ markedly from the rest and are therefore designated as "special category" states (as

mentioned above). For reasons of comparability, the analysis in this chapter is confined to the general-category states, which covers more than 90% of the population.

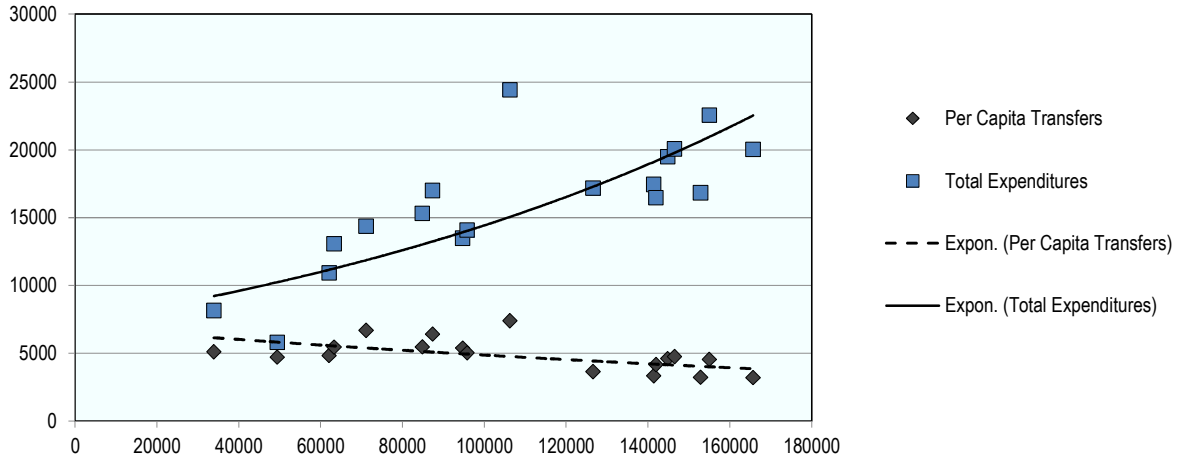
Analysis of the economic and fiscal information presented in Table 4.2 shows a number of interesting features. First, inter-state disparities in per capita incomes (GSDP) are not only high, but have been increasing over the years. In 2014-15, at INR 165 728, the state of Haryana had the highest per capita income, five times the per capita income of Bihar, the lowest income state. As mentioned earlier, the coefficient of per capita incomes in the states has steadily increased from 0.30 in 1981-82 to 0.35 in 1991-92 and further to 0.40 in 2014-15 (Panagariya, Chakraborty and Rao, 2015). Second, not surprisingly, per capita revenues vary with per capita incomes, largely due to variations in revenue-raising capacity. The tax-GDP ratios do not show a clear trend; thus, the variations are mainly due to revenue-raising capacity rather than differences in tax effort. Third, although per capita transfers are higher in the states with lower per capita income, the impact is negligible, and more affluent states end up spending significantly higher per capita than their poorer counterparts (Figure 4.1). It is not surprising that the low-income states with larger infrastructure deficits are unable to catch up with their more affluent counterparts.

Table 4.2. **India: Inter-state differences in per capita GSDP and fiscal variables**

States	Per capita GSDP	Per capita revenue	Tax-GSDP ratio	Per capita general purpose transfers	Per capita special purpose transfers	Per capita total transfers	Per capita total expenditures	Per capita development expenditure
	INR	INR	%	INR	INR	INR	INR	INR
General category states								
Andhra Pradesh	106 263	10 687	8	5 376	2 017	7 393	24 410	18 588
Bihar	33 954	2 026	5.55	3 872	1 223	5 095	8 136	5 579
Chhattisgarh	87 354	7 629	6.65	4 830	1 584	6 414	17 005	13 202
Gujarat	141 405	11 187	6.85	2 067	1 263	3 329	17 446	12 486
Goa	304 666	41 616	8.55	6 453.18	3 360.48	9 813.65	57 666	39 800
Haryana	165 728	12 095	6.25	1 836	1 371	3 207	20 030	13 579
Jharkhand	62 091	4 199	4.77	3 343	1 484	4 827	10 903	7 772
Karnataka	144 869	11 788	7.63	2 488	2 121	4 609	19 482	13 987
Kerala	155 005	12 512	6.69	2 942	1 600	4 542	22 549	11 376
Madhya Pradesh	63 323	6 135	7.55	3 732	1 718	5 450	13 073	9 564
Maharashtra	152 853	10 887	6.42	1 795	1 426	3 221	16 822	11 383
Odisha	71 184	6 411	6.4	4 392	2 295	6 686	14 356	10 740
Punjab	126 606	9 787	6.95	2 371	1 266	3 637	17 153	8 932
Rajasthan	84 837	7 193	6.32	5 251	213	5 463	15 291	11 355
Tamil Nadu	146 503	11 668	7.2	2 839	1 910	4 749	20 062	12 995
Telangana	141 979	9 719	5.61	2 752	1 411	4 163	16 461	12 469
Uttar Pradesh	49 450	4 460	7.11	3 557	1 150	4 707	5 802	4 667
West Bengal	94 711	4 853	4.92	3 385	1 993	5 378	13 465	8 290
All gen. cat. states	95 802	7 895	6.63	3 498	1 531	5 030	14 082	9 807
Special category states								
Arunachal Pradesh	110 217	6 185.6	2.82	30 159.6	25 094.3	55 253.8	34 257	58 102
Assam	60 621	3 630.2	4.77	5 325.3	2 728.7	8 054	7 700	13 156
Himachal Pradesh	147 330	11 323.6	1.59	11 189.5	2 675.3	13 864.8	17 186	31 423
Jammu and Kashmir	77 559	6 278.4	2.68	12 231.7	3 348.4	15 580.2	13 060	26 032
Manipur	58 442	2 269.2	1.13	18 021.7	5 616.2	23 637.8	13 087	27 855
Meghalaya	75 156	4 005.2	0.1	11 587.6	4 482.9	16 070.5	13 211	23 018
Mizoram	93 136	4 297.2	0.06	30 945.2	11 331.7	42 276.9	32 982	55 607
Nagaland	89 607	3 207.8	0.37	15 122.5	18 900.5	34 023	32 907	37 886
Sikkim	240 274	19 361.1	0.51	40 251.8	1 0876	51 127.9	33 186	74 434
Tripura	77 358	3 572.1	0.54	13 905.4	6 615.7	20 521.1	11 961	26 793
Uttarakhand	153 076	8 929.2	0.91	7 408.8	2 795	10 203.8	12 361	24 667
All special category states	84 572	5 604.4	0.97	9 836.3	4 243.8	14 080.1	12 449	22 738
All states	95 802	7 419	6.58	3 757.99	1 641.16	5 399.15	9 977	14 637

Source: Finances of the State Governments 2016-17, Reserve Bank of India.

Figure 4.1. **India: Per capita transfers and expenditure in states according to per capita GSDP**



Source: Finance Accounts of State Governments, Comptroller and Auditor General, Government of India.

The economic and demographic profiles of the general category states classified in high income and low-income categories highlights some important features (Table 4.3). First, the low-income states with a population share of 57% had a GSDP share of just 36.5%. Thus, there is considerable state dependence on central transfers to meet the cost of delivering public services. Second, the low-income states not only suffer from revenue shortfalls, but higher needs for public services as well. The low-income states have a disproportionate number of rural, as well as total, poor living in their jurisdictions. This requires considerably higher outlays on anti-poverty interventions. Similarly, the staggered demographic profile in these states shows a disproportionate share of children in the age group 0-14 years living there. The proportion of children in this age group, at 62.8%, is substantially higher than their population share (57%). These are the states where the demographic dividend will last longer. However, unless outlays on education and healthcare are substantially increased, instead of a demographic dividend, greater problems could arise. This underlines the importance of having a well-designed transfer system not only to offset revenue and cost differences, but also to cater to the varying public service needs of the states. Inclusive development is possible only when fiscally disadvantaged states are empowered to provide comparable standards of public services.

Table 4.3. **Economic and demographic profiles of the states in India**

States	Per capita GSDP (INR)	Population (millions)	Share in GSDP 2014-15	Population 2011	Rural poverty	Total poverty	Children aged 0-14 years
	2014-15	2011	%	%	%	%	%
Andhra Pradesh	121 371	86.9	9.44	7.5	6.1	6.3	6.3
Gujarat	141 405	63.4	8.02	5.5	4.2	3.7	5.2
Haryana	165 728	26.7	3.96	2.3	1.3	1.4	2.3
Karnataka	144 869	63.5	8.24	5.5	3.8	4.4	4.8
Kerala	155 005	34.0	4.72	2.9	1.6	1.7	2.3
Maharashtra	152 853	117.3	16.04	10.1	9.0	10.4	9.4
Punjab	126 606	29.1	3.29	2.5	1.2	1.4	2.2
Tamil Nadu	146 503	74.6	9.78	6.5	4.1	4.9	5.1
High-income states	143 184	495.3	63.49	42.9	31.3	34.2	37.5
Bihar	33 954	110.1	3.35	9.5	14.5	12.8	12.1
Chhattisgarh	87 354	27.1	2.12	2.3	3.1	2.9	2.5
Rajasthan	84 837	72.2	5.48	6.2	5.4	5.5	6.9
West Bengal	94 711	84.6	7.17	7.3	7.5	7.6	6.3
Jharkhand	62 091	35.0	1.94	3.0	3.7	3.4	3.4
Madhya Pradesh	63 323	76.5	4.34	6.6	8.3	8.4	7.2
Odisha	71 184	43.5	2.77	3.8	6.4	5.8	3.5
Uttar Pradesh	49 450	211.0	9.34	18.3	18.5	19.4	20.9
Low-income states	61 799	659.9	36.51	57.1	67.6	65.8	62.8
All India	95 802	1155.2	100	100	100	100	100

Source: Economic Survey, 2015-16, Government of India; Planning Commission, Government of India; Census, Registrar General of Population Census, Government of India.

The transfer system in India

As mentioned above, the Constitution recognises the need to have an independent, impartial mechanism to offset vertical and horizontal imbalances, and has provided for an independent finance commission to make recommendations on the devolution of central taxes and grants to be given to the states. Article 280 of the Constitution mandates the president to appoint a finance commission every five years. The commission has a chairperson and four other members whose qualification for appointment is laid down in the Finance Commission Act passed by the parliament. The terms of reference of the commission are: 1) distribute the net proceeds of union taxes between the union and states and among the states *inter-se*; 2) provide grants to the states; 3) carry out measures to augment the consolidated funds of the states to supplement the resources of rural and urban local governments in the states based on the recommendations of the state finance commissions; and 4) address any other matter referred to the commission by the president in the interest of sound finance. So far, 14 finance commissions have submitted their reports. Their recommendations have been well regarded and generally accepted and implemented by the governments.

The role of the Finance Commission as envisaged in the Constitution was curtailed when the Planning Commission was created through a cabinet resolution. The Planning

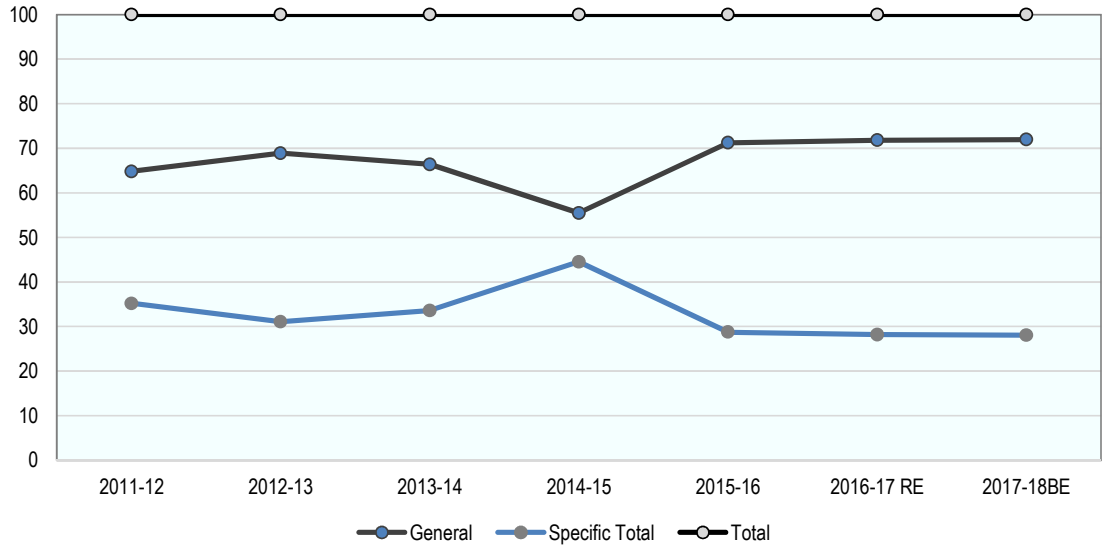
Commission took over the powers to issue grants to the states for planning purposes. The scope of the Finance Commissions' review was confined to assessing the non-plan requirements of the states and making tax devolution and grants to meet these requirements. However, as the Fourteenth Finance Commission's (FFC) terms of reference did not restrict its scope to assessing non-plan requirements, the commission made recommendations to cover the entire general purpose transfers. Thus, when the Planning Commission itself was abolished in August 2014, it did not create any discontinuity. However, even as the Finance Commission is empowered by the Constitution to give all transfers – general or specific - given its temporary nature, the FFC itself decided that it would refrain from giving specific-purpose transfers, which require continuous monitoring.

After the FFC made the recommendations, the entire architecture of the transfer system was changed (Ministry of Finance, 2015). With the Finance Commission making recommendations on tax devolution and block grants and refraining from making any specific-purpose grants, a clear distinction has emerged between general- and specific-purpose transfers. All general-purpose transfers are now recommended by the Finance Commission, and all specific-purpose transfers are given by the respective central ministries. Although the FFC made a recommendation that the design and implementation of specific-purpose transfers should be decided by a committee comprising the representatives of central and state governments as well as domain experts, the central government has continued the practice of making decisions on these transfers at the relevant central ministry level.

The FFC was also concerned with the intrusion of the central government in states' domain through the proliferation of specific-purpose transfers. Its analysis showed that between 2005 and 2012, central government spending on state responsibilities increased from 14% to 20%, and spending on concurrent responsibilities increased from 13% to 17%. Therefore, the FFC increased the share of the states in the divisible pool of taxes[1] from 32%, recommended by the previous commission, to 42%. The increase was mainly on account of the inclusion of plan grants, which was recommended earlier by the Planning Commission, and partly to provide greater autonomy to the states by giving them untied transfers. The FFC adopted a formula for distribution, comprising a mix of variables representing revenue and cost differences. It gave 50% weight to the deviation from the highest per capita income, 27.5% weight to population, 15% weight to the area and 7.5% weight to the forest area.

A significant increase in tax devolution by the FFC has substantially altered the landscape of federal fiscal transfers. While there was only a marginal increase in the total transfers to the states in 2015-16 over 2014-15, in the first year of the award, the share of general-purpose transfers rose significantly from 55.5% to 71% (Figure 4.2). In other words, the sharp increase in tax devolution by the FFC resulted in the share of general-purpose transfers rising significantly, but this was countered by the central government reducing the specific-purpose transfers (Chakraborty and Gupta, 2016). Thus, the about 1 percentage point of GDP increase in general-purpose transfers was countered by an equivalent reduction in the allocation to central schemes.

Figure 4.2. **Share of general- and specific-purpose transfers in India**



Source: Budget documents of the central government, Ministry of Finance, Government of India.

It must be noted that fully offsetting the revenue differences would require giving the states with the lowest per capita revenue capacity five times the per capita transfers, to compensate for the highest state's per capita revenue capacity (as measured by per capita GSDP), which is five times that of the lowest-income state. Even the apolitical technical institution like the Finance Commission has found this to be infeasible, and it could fulfil the objective of general-purpose transfers – of enabling the states to provide comparable levels of services at comparable tax rates - only partially. In this context, the role of specific-purpose transfers in ensuring the minimum level of public services required becomes extremely important.

What is the overall impact of the transfer system in terms of equalising expenditure across the Indian federation? In order to analyse this, the index of per capita revenue actually collected by the states in 2014-15 (by setting the average per capita revenue collection at 100) is compared with the index of per capita revenue accruing to them after the transfers. This is presented in Figure 4.3. The difference in the slopes of the two indexes seen in the figure shows the extent of equalisation. The two important inferences that may be drawn from the figure are that: 1) the transfer system as a whole is equalising; and 2) even after the equalisation, the index of revenue accruals is positively sloped, which implies that the states with higher per capita GSDP have higher per capita revenues available for spending. Thus, while the transfer system as a whole has been equalising, it has not fully offset the revenue shortfalls of the states with lower per capita GSDP.

Figure 4.3. **Equalising the impact of intergovernmental transfers in India, 2014-15**

Source: Author's estimation based on data from budget documents of state governments.

The analysis of the various components of transfers shows that general-purpose transfers are most equalising with the income (GSDP) elasticity coefficient of -0.452 (significant at 1% level), and the specific-purpose transfers have a positive elasticity coefficient of 0.162, which is not significant. The overall transfer system is equalising with the elasticity coefficient of -0.267. As shown in Figure 4.3, the index of the states' own revenue (with the all-state average specified at 100) increases steeply with per capita income. The index of total revenue (including transfers) too shows a positive slope with per capita incomes, but is flatter than the former, reflecting the extent of equalisation. Thus, it can be concluded that: 1) the transfer system as a whole is equalising; 2) the Finance Commission transfers are equalising but offset the fiscal differences of the states only partially; and 3) the grants for central schemes have a positive coefficient and tend to be de-equalising though the coefficient is not significant. As the Finance Commission transfers do not fully offset the revenue differences, the per capita expenditure on public services are substantially higher in states with higher per capita GSDP, even after receiving all the transfers from central government.

The lower levels of per capita expenditure in states with lower per capita incomes is clearly highlighted in Table 4.4, where per capita expenditure under various categories are regressed on per capita incomes in the states for the year 2014-15 in a double-log function. Total, as well as almost all expenditure categories except capital expenditure, show a positive and significant relationship. In the case of total state expenditure, per capita expenditure are higher by 0.65% when per capita income is higher by 1%. The relevant elasticity is 0.69 in the case of current expenditure. It is 0.65 in the case of expenditure on social services and 0.43 in the case of economic services. Within social services, the elasticity is 0.64 in the case of education and 0.72 in the case of healthcare.

Table 4.4. **India: Trends in general- and specific-purpose transfers**

Period	General-purpose transfers	Special-purpose transfers	Total transfers	General-purpose transfers
	% of GDP	% of GDP	% of GDP	% of total transfers
2011-12	3.63	1.97	5.6	64.78
2012-13	3.61	1.63	5.24	68.89
2013-14	3.48	1.76	5.24	66.39
2014-15	3.41	2.74	6.15	55.49
2015-16	4.32	1.74	6.06	71.23
2016-17 RE	4.69	1.84	6.53	71.81
2017-18 BE	4.61	1.80	6.41	71.93

Note: "BE" represents budget estimate and "RE" represents revised estimate.

Source: Budget documents of the central government, relevant years.

The analysis shows that despite equalising transfers, public spending is higher in more developed states. The elasticity of spending with respect to GSDP is positive and significant with respect to all categories, as is shown in Table 4.5 and Figure 4.4. The elasticity is 0.66 for total expenditure and 0.55 for economic and social services. It is unusually high in the case of education and healthcare expenditure, which are critical to human development. This feature leads to increasing inequalities in infrastructure levels and human development, causing divergence of incomes across the Indian states. The matter is particularly concerning in the case of education and healthcare where the elasticities are high, and given the staggered demographic profile in poorer states, the requirement for public spending is higher. These figures confirm the fact that the transfer system has been helpful in offsetting the fiscal shortfalls of the poorer states only partially and significant inequalities in the standards of public services continue to persist.

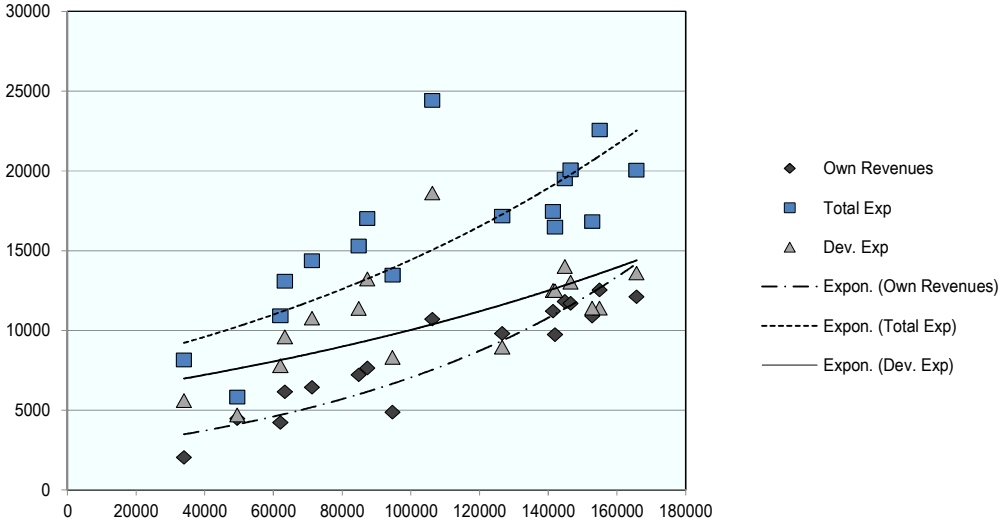
Table 4.5. **Elasticities of per capita expenditures with per capita GSDP in Indian states**

Expenditure category	Constant (a)	Regression coefficient (b)	Adj. R^2
Total expenditure	1.5486 (1.2189)	0.6906 (6.2535)*	0.70
Capital expenditure	2.6142 (0.8169)	0.4248 (-1.5202)	0.08
Expenditure on economic and social services	2.9471 (2.0104)	0.5488 (4.3063)*	0.52
Expenditure on social services	1.1281 (0.8551)	0.6511 (5.6781)*	0.66
Expenditure on economic services	3.5793 (1.8422)	0.4274 (2.5307)*	0.25
Expenditure on education	0.4324 (0.2499)	0.642 4.2681)*	0.52
Expenditure on public health	-1.6654 (1.0743)	0.7185 (5.3322)*	0.63
Total expenditures	2.0866 (1.644)	0.6562 (5.9465)*	0.68

Note: Estimated equation is: Per capita expenditure = Log a + b log Per Capita income + ∈, * Denotes significant at 1% level.

Source: Author's calculations.

Figure 4.4. **Per capita revenues and expenditures in Indian states according to per capita GSDP, 2014-15**



Source: Author's estimates based on data from the budget documents of the States.

As mentioned above, considering the high degree of inter-state inequality in per capita GSDP, completely offsetting the fiscal differences to enable the low-income states to equalise their per capita expenditures may simply not be feasible in the prevailing political environment. First, presently the union government does not have fiscal space to meet its own obligations, to assume any significant increase in the transfers. Second, there are significant deficits in the standards of physical and social infrastructure provided even by high-income states, and they too need to spend large amounts on the development. Therefore, all states clamour for higher transfers. Third, there are arguments that equitable transfers may reduce the overall growth of the economy, which, in the long run, may prove inimical to the interests of the more impoverished states themselves. Therefore, the general-purpose transfers, which are supposed to enable all states to provide comparable levels of public services at comparable tax rates, can do so only to a limited extent.

It is in this context that the role of specific-purpose transfers becomes critical. In particular, equalisation in specific meritorious services, such as education and healthcare, rural roads and anti-poverty interventions can help augment the services in these areas. However, as pointed out above, in India, the central government has adopted 28 schemes under its Centrally Sponsored Schemes (CSS) programme and another 45 central sector schemes are competing for assistance. With too many equalisation schemes and with limited fiscal space available for giving grants, this has meant spreading the resources thinly, without much impact on service levels. Most of these schemes are in the areas specified in the state list and truly belong to the domain of the states. If the latter is not able to provide these services adequately, they should be enabled to provide them through general-purpose transfers rather than through conditional transfers. Of course, specific-purpose grants should be given to augment services with high degrees of inter-state externalities or those that are considered highly meritorious, but these will have to be limited, to make a difference in service levels.

Specific-purpose transfers: Three case studies

In addition to tax devolution and the grants given to the states based on the recommendations of the finance commissions, the central government gives conditional grants for various purposes through the respective ministries. The objective of specific-purpose transfers, as mentioned earlier, is to ensure minimum standards of services that are considered meritorious or those services with significant inter-state spillovers. However, in the Indian context, this has been used to extend patronage to serve the political objectives of the ruling parties at the centre of government in order to influence the electorate.

In 2012, there were 147 such schemes initiated by various central ministries and the grants for many of them were directly given to numerous implementing agencies created explicitly for the purpose of bypassing the states. In 2013, these schemes were consolidated into 66, and in 2014, based on the recommendation of the Expert Committee on Efficient Management of Public Expenditure, the central government channelled all the grants through the state governments. After the FFC made the recommendation to increase tax devolution to 42% of the divisible pool, the central government appointed a committee of selected chief ministers of the states with the Chief Minister of Madhya Pradesh as the convener to further consolidate and rationalise the schemes. The committee consolidated the schemes into 28 and classified them into "core of the core", "core" and "optional" with matching requirements from the states stipulated at 30%, 40% and 50% respectively.

There are six "core of the core" schemes including the major rural employment programme for the poor and 22 "core" schemes. In addition to these, there are 45 central sector schemes implemented in states for specified purposes. The total amount of funds spent on all central sector and centrally sponsored schemes in 2016-17 amounted to 1.8% of GDP, constituting about 28% of total transfers. Of these, only three schemes – the National Health Mission, the Universal Elementary Education Programme, and the Mahatma Gandhi National Rural Employment Guarantee - are implemented.

National Health Mission

The National Health Mission (NHM) is a specific-purpose grant given to the states to provide "accessible, affordable, accountable, effective and qualitative" healthcare (Ministry of Health and Family Welfare, 2012, p .2). The essential features of the programme are: 1) safeguard the health of the poor, vulnerable and disadvantaged persons; 2) strengthen public health systems as a basis for universal access and social protection against rising costs; 3) build an environment of trust between the people and health service providers; 4) empower the communities to become active participants in attaining the highest possible level of health; and 5) improve efficiency and optimise the use of resources. These are intended to be achieved by building an integrated network of primary, secondary and a substantial part of tertiary healthcare facilities, and achieving inter-sectoral co-ordination to address food security, nutrition, access to safe drinking water and sanitation, the education of female children, occupational and environmental health determinants such as women's rights and employment, and different forms of marginalisation and vulnerability. The programme is financed through a specific-purpose grant with the central government contributing 60% in the case of general category states and 90% in the case of special category states.

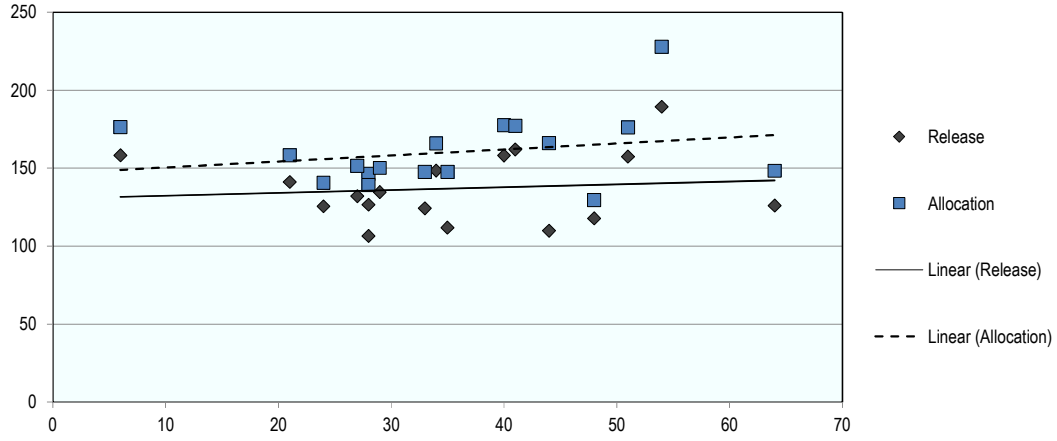
The funds are allocated by the Union Ministry of Health and Family Welfare determining the resource envelope on the basis area and population weighted by perceived disadvantage, socio-economic disadvantage and the health lag of the states. In addition, a

10% weight is given to the demonstrated absorption capacity. Based on the resource envelope communicated to the states, they prepare their annual programme implementation plans (PIPs), and these are appraised and approved by the National Programme Coordination Committee (NPCC), chaired by the Secretary of the Ministry of Health and Family Welfare. The states are then required to implement the plans as approved. The analysis of the design and implementation of the scheme highlight a number of policy issues that should be revisited for the programme to be made effective, as follows:

1. Although the objective is supposed to be to ensure minimum standards, the programme as it has evolved lacks clarity of purpose. Specifying too many objectives results in too many interventions and spreads the resources thinly across many activities, in addition to increasing the difficulties in monitoring. In a shared cost programme, it is vital that the implementing level of government should be allowed to plan and implement the programme. Allocating resources across several activities within the health sector will increase bureaucracy without ensuring efficient resource allocation. Such micromanagement of the programme betrays the lack of trust in the states. It would be useful to set the targets in terms of infrastructure created, such as the number of health centres and sub-centres, the number of health professionals and availability of medicines as per the norms; and institute an accountability system in which the health system is made accountable to the people. Specifying the targets in terms of the above would help to link the outlays to the creation of health facilities, making it easy to achieve accountability.
2. If the objective is to ensure minimum standards of healthcare services, the resource allocation should be determined on the basis of the shortfall from the specified standards or the extent of health lags. The current formula gives some arbitrary weights to the states on the health lags. In other words, it is hard to find a significant and positive correlation between the grants given and the health status in the states. Kerala, the state with the best infant mortality rate (IMR) gets the third highest grant allocation as well as release. This is clearly seen in Figure 4.5, where the per capita NHM grant allocation as well as release to states is shown against IMR according to the National Family Health Survey (NFHS) IV. Similarly, for Uttar Pradesh, grants allocated as well as released to states with the highest IMR is much lower than many states with much lower IMR. Thus, both the allocation and release of funds to the states are not to ensure minimum standards of services.
3. The analysis of actual release of funds shows that the release of funds was lower than the original allocation in all the states. The most significant shortfall was in Jharkhand followed by the newly created states of Andhra Pradesh and Telangana. Among the low-income states, besides Jharkhand, the shortfall was more than 15% in Chattisgarh and Uttar Pradesh.
4. The fact that there was a shortfall in the actual release from the original allocation implies that this was largely due to the budget cut. This is revealed by the fact that the actual expenditure on NHM in 2014-15 was lower than the budget estimate by 20%. Cutting the expenditure arbitrarily defeats the purpose of ensuring minimum levels of expenditure.
5. It has been mentioned that one of the reasons for the shortfall in the actual release of expenditure from the original allocation is the inability to provide the utilisation certificates and fulfil other compliances in time. At the same time, as the Union Ministry of Health and Family Welfare wants to utilise the funds, the funds allocated to those states that do not fulfil the compliances are distributed to those

that do. This defeats the purpose of equalisation. The issue must be addressed by building capacity in non-complying states and perhaps, introducing multi-year budgeting so that these states get the funds and use them in an efficient manner to get the desired outcomes.

Figure 4.5. **Per capita grant allocation and release according to the infant mortality rate in Indian states, 2014-15**



Source: Author's calculations.

Universal Elementary Education Programme (Sarva Shiksha Abhiyan)

Sarva Shksha Abhiyan (SSA) is a shared cost programme to ensure universal elementary education in the country. It is implemented in partnership with the states. The objectives of the scheme are to ensure universal access and retention, inclusiveness by bridging gender and social category gaps in education, and enhancement in the learning levels of children. The enactment of the Right of Children for Free and Compulsory Education (RTE) Act in 2009 has introduced additional issues. The act mandates that every child in the 6-14 age group is entitled to have free and compulsory education in a neighbourhood school until the completion of elementary education. The framework for implementation of SSA was accordingly amended in September 2010 to align it with the provisions of the RTE Act. An important provision of the act is the requirement to allocate 25% of the seats in private schools to children belonging to disadvantaged groups in Class 1 or pre-primary class with the government required to reimburse the fees of these children.

The objectives of the programme of universal elementary education, closing the gender and social groups' gaps, and improving the quality of education is aimed to be achieved through 42 interventions grouped under 8 different components. These include access and retention, quality, gender, equity, reimbursement of expenditure for 25% of admissions in private schools, infrastructure development, programme management and other issues. This is a shared cost programme between the central and state governments. During the period 2010-14, the sharing ratio between the cental government and states was 65:35 for general category states and 90:10 for the special category states. After 2015-16 the ratio for GCS changed to 60:40, while the ratio for SCS remained the same.

Analysis of grants

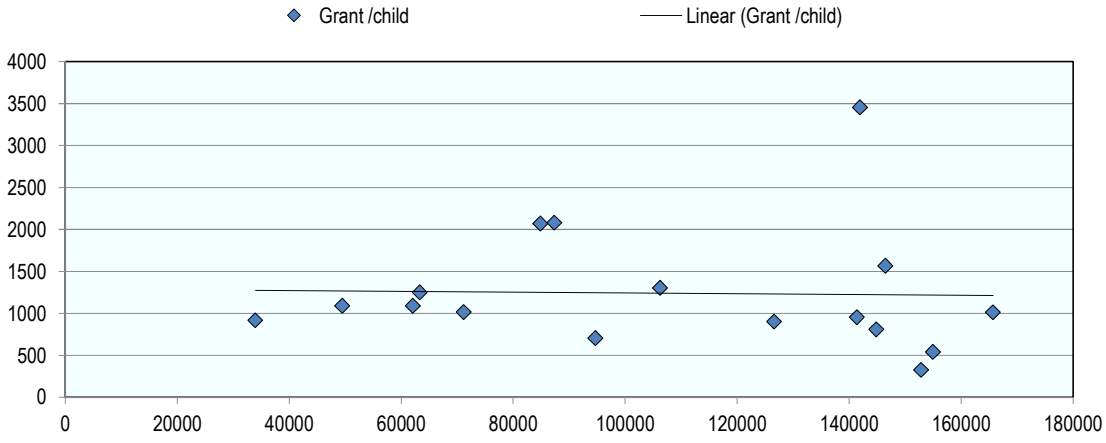
There are as many as 42 interventions within the SSA with multiple objectives, and the states are required to prepare their plans for each of the interventions. Multiple objectives

make defining the minimum standards difficult. For example, while the enrolment ratio can be defined, it is not possible to clearly define and set minimum standards for the quality of education to be achieved. The focus then shifts to inputs such as a teacher-student ratio or physical infrastructure provided rather than learning outcomes. In the end, the RTE ends up with attendance at schools rather than educating the young.

There are a number of issues of both design and implementation regarding the scheme. As may be seen from Figure 4.6, the expenditure per child of school age (6-13 years) in the states is positively related to per capita GSDP with a correlation coefficient of 0.688. This shows that the SSA has not had a significant impact on equalising per child spending and the states with low revenue capacity continue to suffer from poor educational standards as compared to their more affluent counterparts. In addition to lower expenditure, poor implementation results in a lower teacher-student ratio, employment of untrained teachers, teacher absenteeism and an inability to provide teaching materials. Thus, the basic objective of equalising standards of elementary education is defeated.

The preparation of plans for the SSA is done on an incremental basis and not on the basis of the shortfall in standards of elementary education. Thus, the grants are given not necessarily on the basis of the shortfall in the standards of elementary education, but on the basis of the ability of the state to prepare its plans. The spread of grants per child aged 6-13 across the states arranged according to per capita GSDP shows virtually no relationship between the two variables (Figure 4.6). This shows that the distribution of grants has not been according to the shortfall in the standards or revenue differences of the states. This is a matter of concern, as in low income–highly populated states with a higher proportion of school age children, the low per child expenditure will accentuate educational inequality.

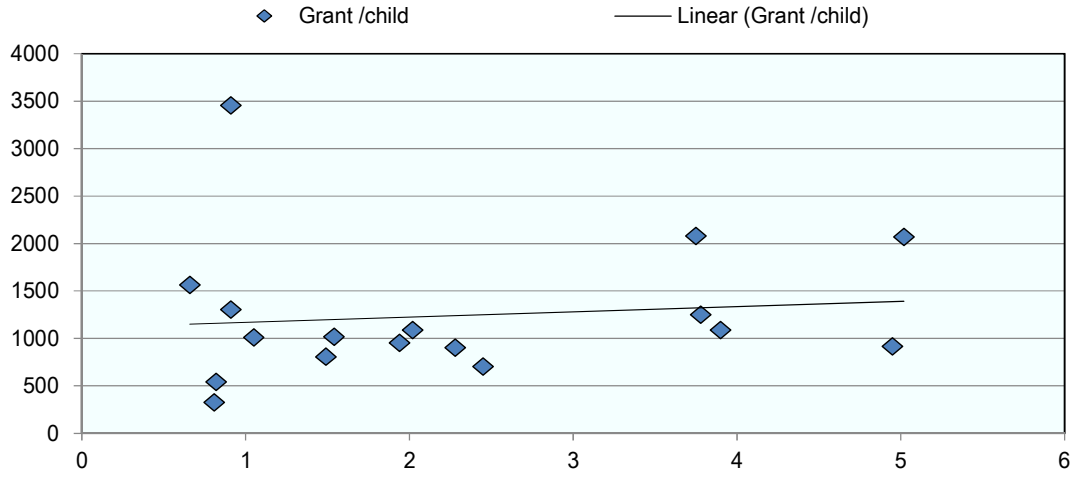
Figure 4.6. **Grant per child according to per capita GSDP in Indian states**



Source: Author's calculations.

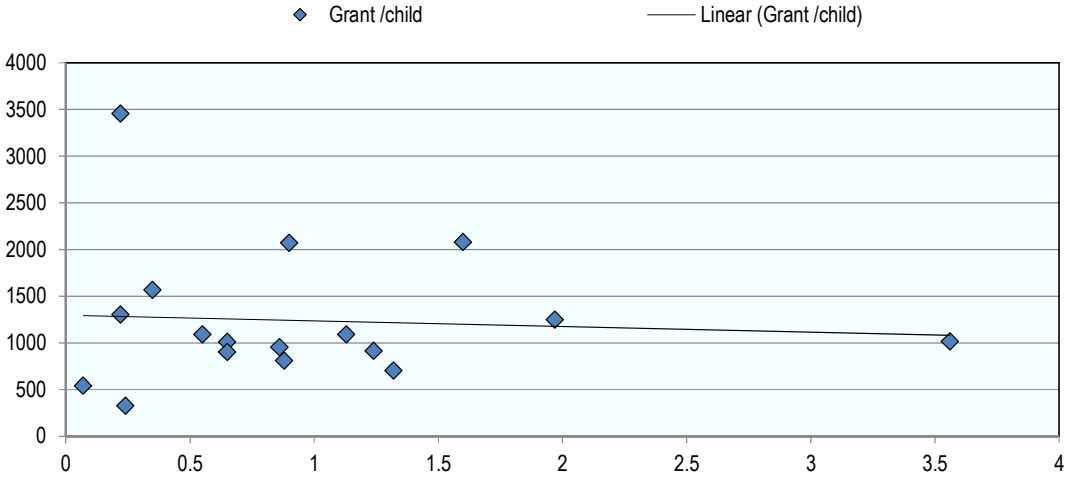
The shortcoming in the design of the grants under the SSA is reinforced when we look at Figures 4.7 and 4.8. In Figure 4.7, the SSA grant in 2014-15 in the states is shown against the ratio of out-of-school children taken from the *Statistics on School Education 2011-12*, published by the Ministry of Human Resource Development. If out-of-school children are taken as a measure of educational standards, the figure shows that there is hardly any relationship between the grants given and educational standards in the states (correlation coefficient: 0.112). Similarly, per child grants to states according to the dropout ratio (Figure 4.8), too, show virtually no relationship between the two variables with a correlation coefficient of -0.0698.

Figure 4.7. **Grant per child according to the ratio of out-of-school children to total children in Indian states**



Source: Author's calculations.

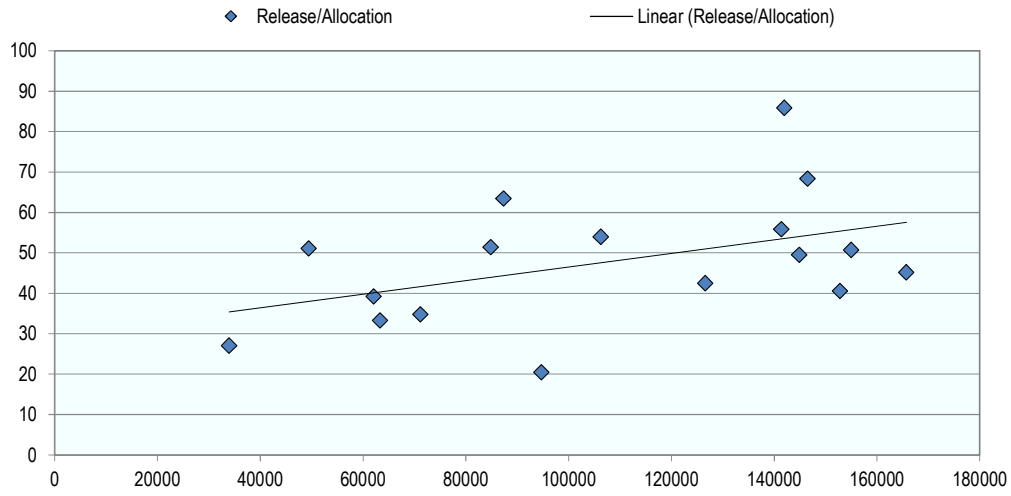
Figure 4.8. **Grant per child according to the dropout ratio in Indian states**



Source: Author's calculations.

The lack of equalisation in the SSA grants is not only due to the shortcomings in the design of the grant system, they are also due to implementation problems. The low-income states have been lagging in fulfilling the conditions and the grants allocated to them in full. The positive relationship between the ratio of grants released to allocation with per capita GSDP shows that the higher income states are able to implement the scheme better than the less affluent states (Figure 4.9). In other words, the low-income states not only are allocated lower per child grants, but they are also unable to utilise the grants allocated to them. The variations in the utilisation rates could be due to their inability to implement the schemes expeditiously, or an inability to fulfil the conditions, like timely auditing of the accounts, a compilation of information on the utilisation from the village level or simply an inability to provide matching resources, as required in the scheme. This implies that there is a need to revisit the conditions to make them simpler, as well as a need to build capacity to implement the schemes in poorer states.

Figure 4.9. **Ratio of the release of grants to allocation in SSA, according to per capita GSDP in Indian states**



Source: Author's calculations.

Considering the importance of the scheme, it may also be useful to think in terms of multi-year implementation plans to avoid losing the grants. As far as matching ratios are concerned, encouraging educationally lagging states, the central government could introduce different matching ratio requirements depending on the extent of educational backwardness or revenue shortfalls. The special category states, in any case, should make lower matching contributions. Even among the general category states, it may be appropriate to classify them into three categories in terms of educational backwardness/revenue shortfalls and have a matching ratio of 30%, 40% and 50% for the most backward, median and least backwards category states.

After the enactment of the RTE, a provision was made to provide 25% of the seats in private schools to disadvantaged children, with reimbursement of the fees by the government. While this can be a gateway to these children to avail elite education, it can also create social problems. First, only a minuscule minority of the students can get a chance to get admitted by private schools. Second, given that the social background of the disadvantaged students admitted under RTE is very different from that of the regular students, there can be a feeling of segregation and discrimination. Furthermore, given the varying family backgrounds with the general students having access to parental guidance or paid tuitions after school, the RTE students may find it hard to compete with the regular students. It is crucial that the states should work towards improving the standards in government schools by having an adequate number of trained teachers, constantly upgrading their skills, enforcing their attendance and regular teaching in schools and providing them with teaching materials and aids.

The critical issue in the SSA should be to reduce educational inequalities among the states so that children are provided with access to education irrespective of where they live or their economic and social background. The focus will have to be not on enrolment, but on learning. This requires improvements in the design and implementation of the scheme and the capacity and willingness by the states to enforce compliance among the teachers. In particular, there is a need to build capacity in the lagging states. Multiple interventions with cumbersome conditions only add to the problems of implementation and bureaucratic interference.

Mahatma Gandhi National Rural Employment Guarantee

According to the World Bank, the Mahatma Gandhi National Rural Employment Guarantee (MGNREGA) is the world's most extensive public works programme. This is a programme designed to ensure livelihood security by providing 100 days of guaranteed wage employment in a financial year for an adult member of every household who volunteers to undertake manual work. It was started in 200 districts in 2006, expanded to an additional 130 districts in 2007 and rolled out to the entire country in 2008.

The salient features of the scheme are:

1. This is a rights-based scheme for adult members willing to do manual labour.
2. The employment must be provided to the job cardholders within 15 days of their application, failing which they are entitled to receive unemployment allowance.
3. Job cardholders can receive employment entitlement up to 100 days in a financial year depending on their demand.
4. The works chosen must be labour intensive with unskilled wages constituting 60% of the cost.
5. Implementation of the scheme is carried out at decentralised levels with village-level government (*panchayats*) required to implement 50%. The entire work plan is supposed to be identified and recommended by the village assembly. The *panchayats* have been given the primacy in planning, implementing and monitoring the scheme.
6. Facilities such as crèche, drinking water, first aid and shade should be provided at the work sites.
7. Women beneficiaries must constitute one-third of the employment provided.
8. There must be proactive disclosures through social audit and grievance redressal mechanisms to ensure transparency and accountability.
9. States are responsible for implementation and ensuring that work, as demanded for up to 100 days, is guaranteed.

Under the MGNREGA, the work plan is supposed to be decided on the basis of a participatory planning exercise. The responsibility for preparing the labour budget for the next financial year along with the details of unskilled labour requirements is assigned to the district programme co-ordinator, and this task has to be completed by December. The work plan including the shelf of works and employment demand is determined right from the village level and is aggregated at the block, district and state levels. These estimates scrutinised by the state government are submitted to the Empowered Committee, chaired by the Secretary of Rural Development within central government. After taking these inputs into account, the Empowered Committee finalises the labour budget based on the performance of the state in terms of: the employment created during the preceding four years; the planning process adopted to finalise the labour budget in the state; an appraisal of the initiatives and strategies of the state to improve delivery mechanisms and assessment of the requirement of the state in terms of magnitude and intensity of rural poverty as reflected in the *Socio-Economic Caste Census, 2011* (SECC) estimates; and frequency of the occurrence of natural calamities. The labour budget thus, finalised, is only indicative and

not a ceiling. The states are required to cater to the actual demand for work during implementation.

The funds to the states are usually released in two tranches, and there can be more than one instalment in a tranche. The amount in a tranche depends upon the approved labour budget, opening balance, pending liabilities of the previous year and overall performance. The release of the first tranche is subject to the submission of: 1) a certificate that the accounts for all the districts of the state for the financial year before 2014 have been settled; 2) a certificate on the settlement of all audit paras under the MGNREGA; 3) a detailed action-taken report on the complaints forwarded to the state; 4) a certificate indicating satisfactory compliance with the ministry's clarifications/suggestions/guidelines and observations from time to time; 5) a certificate to the effect that there has not been any mutualisation and misappropriation of funds.

The second tranche is released subject to the fulfilment of the prescribed conditions and on submission of the proposal in the prescribed format by the state. The proposal can be submitted only after the district/state utilises 60% of the available funds. If the second tranche proposal is submitted after 1 October, it is necessary to submit the audit report of the previous year. The amount of funds released in the second tranche depends on the performance in the utilisation of the funds available.

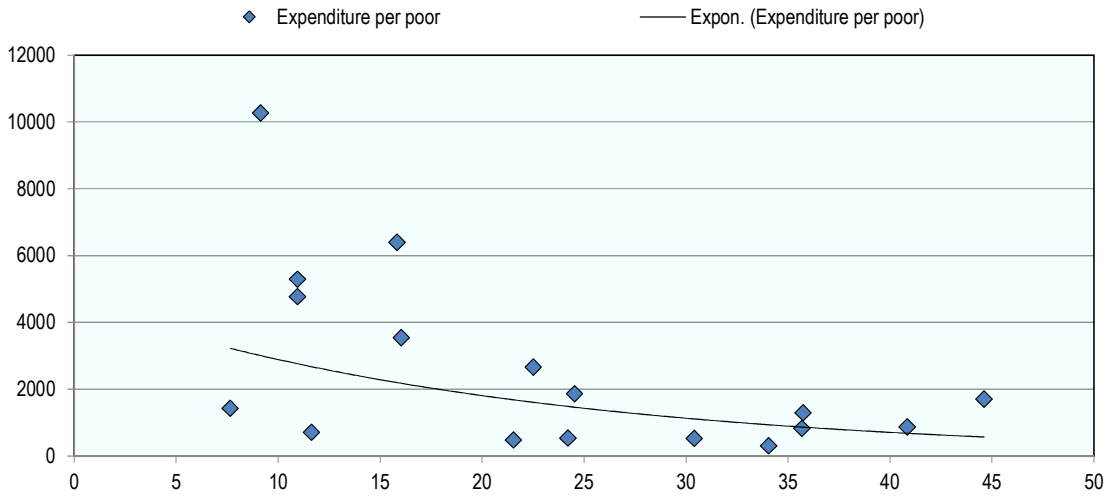
Analysis of the scheme

Redistribution by government is necessary because markets do not bring about the distribution of income and wealth desired by government. While funding for redistribution has to come predominantly from the central government, implementation of anti-poverty interventions has to be at the local level for reasons of comparative advantage (Rao and Dasgupta, 1995; Rao, 2002)

This is undoubtedly an important anti-poverty intervention. The self-selection through unskilled manual work in the scheme makes targeting the benefits of the scheme to the poor automatic. Indeed, there are challenges in implementation and possibilities of misappropriation at the grass-roots level in the feudal oligarchic power structure in rural areas. There are also administrative costs and bureaucracy at various stages with the potential power to seek rents. These issues of implementation have to be addressed by strengthening checks and balances, including an effective social audit.

Although there are multiple objectives in the scheme, the principal focus is to reduce the distress caused by rural poverty. This would mean that the spending on MGNREGA should spread across the states such that the state with a higher concentration of poverty should receive higher amounts. The analysis of per poor spending on MGNREGA across different states shows that in 2014-15, per poor rural expenditure negatively correlated (-0.572) with the rural poverty ratio according to the Tendulkar measure (Figure 4.10). This shows shortcomings in the targeting of MGNREGA.

Figure 4.10. **Rural poverty expenditure per poor, according to the rural poverty ratio, in Indian states**

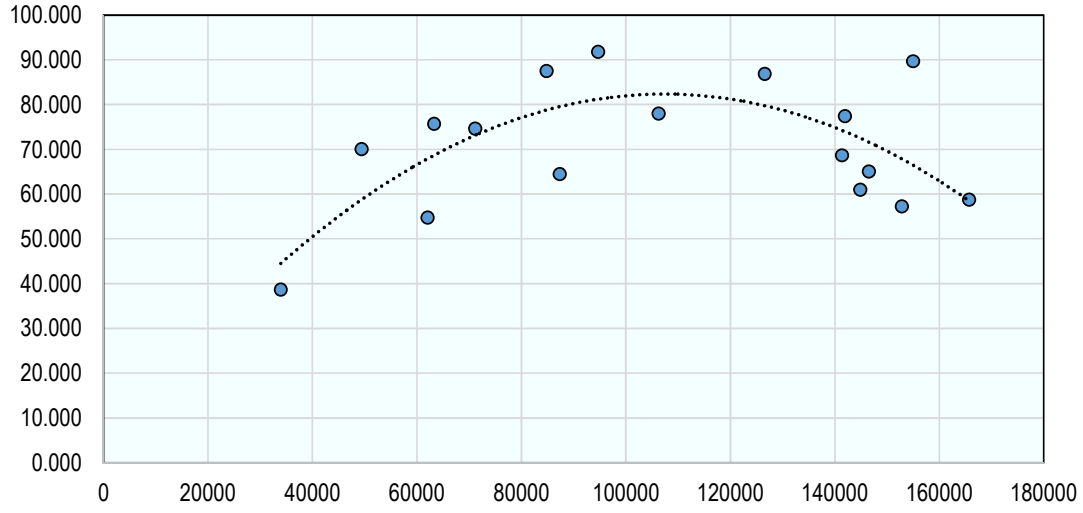


Source: Author's calculations.

This result is not surprising, as despite being a demand-driven programme, the labour budget is finalised on the basis of factors such as performance of the state in creating employment during the preceding four years; the planning process adopted to finalise the labour budget; the initiatives and strategies of the state to improve delivery mechanisms and assessment of the requirement of the state in terms of magnitude and intensity of rural poverty as reflected in the SECC estimates; and frequency of the occurrence of natural calamities. In this list of factors, the SECC poverty measure is the only factor that targets the spending on rural poverty. Besides being largely incremental, there is considerable discretion exercised by the Empowered Committee. As a result, it is not necessarily the states with the highest poverty concentration that receive the highest MGNREGA grant.

Figure 4.11, which plots the difference between the original cost estimate and the final release of expenditure arranged according to per capita GSDP in the states, highlights an interesting pattern. The ratio of grant releases by the central government to the states with very low per capita GSDP is the lowest. The ratio increases as per capita GSDP increases and then declines at very high per capita GSDP levels. The states with low per capita GSDP have the highest concentration of rural poverty, and the programme is much more important for them than for more affluent states. At very high income levels where the rural poverty ratio is low, the states themselves may not attach much importance to the programme and utilise the funds.

Figure 4.11. **Release as a percentage of allocation, according to per capita GSDP, in Indian states**



Source: Author's calculations.

The important point is that as MGNAREGA is a programme of giving wage employment to the poor, it is desirable to design the grant system based on a single factor of rural poverty rather than on other considerations. If indeed the states do not have the capacity to design the works and implement the programme, the solution lies in developing their capacity through handholding so that the overall objective to provide assured wage employment to the rural poor is met.

One of the reasons for the low ratio of the actual release of grants to the original expenditure estimate in the states with a low per capita GSDP may be due to their inability to provide matching contributions. Although MGNREGA is considered as a "core of the core" programme, the states are required to make a matching contribution of 30% to the central contribution. The contribution is uniform across the general category states. As suggested in the case of NHM and SSA, it may be desirable to devise a different system of matching ratios depending on the revenue-raising capacities of the states. This would help the states with low per capita GSDP, which are also those with a high concentration of rural poverty, to utilise the grants better.

Reform issues in specific-purpose transfers

The foregoing analysis of the three crucial specific-purpose transfers shows that there are serious shortcomings in their design and implementation. Essential reform issues to render the schemes more effective are as follows:

1. Considering that the objective of specific-purpose transfers is to ensure minimum standards of services, it is important to define the minimum standards and estimate the cost of providing them. In other words, the objective of each of the specific-purpose transfers must be clearly defined. This also implies that it is necessary to avoid multiple objectives and focus on the single objective of ensuring minimum standards of services chosen for equalisation across the country. This would avoid multiple interventions, micromanagement of the programme, the thin spread of resources across interventions, and high transaction costs of administration, including reporting requirements.

2. The resource envelope allocation to the states should be made purely on the basis of shortfalls in infrastructure and services according to the specified norms. In the case of NHM, for example, the present system of allocating funds on the basis of area and population-weighted according to health lags is arbitrary and does not allocate resources according to the varying standards of the health care infrastructure. This is also the case for the SSA. In each case, it is necessary to define the minimum standard sought to be equalised and make allocations accordingly.
3. The difference between original allocation and ultimate release creates difficulties in implementing the planned activities. The difference mainly arises on account of cuts in the central budget for the schemes or inability of the recipient state governments to fulfil the compliance requirements, including the timely provision of utilisation certificates. Simplification of the transfers would reduce the compliance requirements for the states. In some cases, considering the vast inequality in the standards of services, multi-year budgeting may have to be introduced in order to avoid the lapsing of funds for disadvantaged states. In some cases, there should be provisions for capacity building to meet the compliance requirements for obtaining grants.
4. Given the vast differences in the standards of services as well as spending across states, and the constraints on fund availability, it is important to limit the number of schemes for specific purpose transfers, to the most important merit goods to achieve a reasonable degree of equalisation. Furthermore, it is also desirable to introduce different matching requirements for different states depending on their revenue-raising capacity. The GCS may be grouped into three categories depending on their revenue-raising capacity as high, moderate and low capacity states and the matching ratio for the states could be fixed at 50%, 40% and 30%. This way, low capacity states will find it easier to contribute their matching requirements and obtain the central transfers.
5. Considering the objective of ensuring minimum standards, it is vital to ensure that the grants given to the states add to the expenditure on the services and are not substituted by the states. This would require adding a condition for obtaining the grants. This could be done either by stipulating that the expenditure excluding the transfers on the service does not fall short of the projected expenditure excluding the transfer for the year or by stipulating that the share of the expenditure on the service in the total budgetary expenditure increases by the volume of grants received.

Conclusion

The design and implementation of general- and specific-purpose transfers are critical in the Indian federation from the viewpoint of not only ensuring horizontal equity, but also balanced regional development, inclusive growth and overall stability and integrity of the federation. This becomes even more important when there are significant barriers to the mobility of the population; therefore, it is necessary to take capital to the people and not wait for the people to move to the capital.

Analytically, general-purpose transfers are given to offset fiscal shortfalls of the lagging states so that all states are able to provide comparable levels of public services at comparable tax rates. However, given the significant variations in fiscal differences across

the Indian states – with per capita income in the highest income state five times that of the lowest income state – it becomes difficult to design the general-purpose transfers to offset the revenue and cost differences fully. Even the wealthiest state suffers from severe infrastructure deficits; therefore, all states clamour for transfers. This poses constraints on the extent of equalisation through instruments like tax devolution. This raises the importance of specific-purpose transfers to ensure the minimum standards of required services.

In India, after the recent changes in the institutional architecture, all general-purpose transfers are given based on the recommendations of the Finance Commission. The latest is the FFC whose recommendations have been implemented since 2015-16. The second source of grants is from various central ministries, which are scheme based. There are at present 28 centrally sponsored schemes and another 45 central sector schemes for which grants are given by various central ministries.

The analysis of intergovernmental transfers shows that that tax devolution and grants given on the recommendations of the Finance Commission have a robust equalising element, whereas those given by various central ministries do not. Even the former is able to offset the revenue shortfalls of low-income states only partially. The consequence of this is that the higher income states are able to incur significantly larger per capita expenditure on all major social and economic services as well as in the aggregate. This tends to accentuate inequalities in social and economic infrastructures among the states, leading to an increasing divergence in developmental outcomes.

There are a number of problems with the design and implementation of specific-purpose transfers:

1. They are not linked to service-level outcomes, but tend to be incremental.
2. The large number of specific-purpose transfer schemes taken up for equalisation results in the thin spread of resources, with hardly any impact on service levels.
3. The grants are not linked to improving service levels, and it is not necessarily the states with a more substantial shortfall in services that receive higher grants. Thus, educationally backward states do not receive higher grants for education and states with the lowest health standards do not get higher per capita grants for health. The analysis shows that the states with a higher concentration of the rural poor get lower per poor grants for rural employment.
4. There is a considerable difference between the initially approved allocation and final release of funds under various schemes, and the difference is more significant in the case of low-income states. The inability of the centre of government to provide the funds allocated at the beginning of the year creates considerable uncertainty about the use of funds.
5. One reason for the more significant shortfall in low-income states is perhaps the uniform matching requirements. The low fiscal space available in poorer states makes it difficult to provide the matching contributions to utilise the funds allocated to them fully.
6. The requirement to seek grants under several different interventions within a scheme results in lack of flexibility to the recipient in the use of funds.
7. In some schemes like healthcare, the states were able to substitute grants for their own spending with the result that there has not been a commensurate increase in spending on healthcare after the grants are received.

The central government may not be able to influence much as far as the Finance Commission's recommendations are concerned, as the commission is an independent body recommending tax devolution and grants. However, the centre of government can certainly do well to rationalise the central sponsoring schemes. There is an urgent need to reduce the number of schemes and fund them adequately to make a difference to the service level. It is important to link them to a shortfall in specified services so that the overall objective of ensuring minimum standards is achieved. There is also undoubtedly a case for having differential matching requirements, with states' contributions increasing as the shortfall in services declines.

Note

1 . The divisible pool of taxes comprises total central taxes (excluding the revenue from earmarked taxes) minus the revenue from cesses and surcharges and cost of collecting the taxes.

References

Ahmad, Ehtisham (1997), "Intergovernmental transfers – An international perspective", in Ehtisham Ahmad (ed.), *Financing Decentralized Expenditures: An International Comparison of Grants,* Edward Elgar Publishers, Cheltenham.

Boadway, Robin and Frank Flatters (1982), *Equalization in a Federal State: An Economic Analysis*, Economic Council of Canada, Canadian Government Publishing House.

Buchanan, James M. (1950), "Federalism and fiscal equity", *American Economic Review*, Vol. 40, No. 4; pp. 583-99.

Chakraborty, Pinaki and Manish Gupta (2016), "Evolving centre-state financial relations", *Economic and Political Weekly*, Vol L1, No. 16.

Feldstein, Martin (1975), "Wealth Neutrality and Local Choice in Public Education", *American Economic Review*, Vol 65, pp. 75-89

Ministry of Finance (2015), "Report of the Fourteenth Finance Commission", Government of India.

Ministry of Health and Family Welfare (2012), "Framework for Implementation: National Health Mission 2012-17", Government of India.

Panagariya, Arvind, Pinaki Chakraborty and M. Govinda Rao (2015), *Growth and Development of States in India*, Oxford University Press, New York.

Rao, M. Govinda (2010), "A review of Indian fiscal federalism", report of the Commission on Centre -State Relations, *Research Studies* 1.

Rao, M. Govinda (2009), "Fiscal federalism in India: Trends and reform", in S. Ichimura and R. Bahl (eds.), *Decentralization Policies in Asian Development,* World Scientific Publishing Company, pp. 107-140.

Rao, M. Govinda (2002), "Poverty alleviation under fiscal decentralization", in M. Govinda Rao (Ed), *Development, Poverty and Fiscal Policy: Decventralization of Institutions*, Oxford University Press, New Delhi,

Rao, M. Govinda and A. Dasgupta (1995), "Intergovernmental transfers as an instrument to alleviate poverty", *Environment and Planning C: Government and Policy,* Vol. 13, pp. 1-23.

Rao, M. Govinda and Subrata Mandal (2009), "Resource endowment, fiscal flows and regional equity in Indian federation", in M. Govinda Rao and Anwar Shah (eds.), *States' Fiscal Management and Regional Equity: An Overview*, Oxford University Press, New Delhi.

Further reading

NITI Aayog (2017), "India: Three-Year Action Agenda, 2017-18 to 2019-20", National Institution for Transforming India, Government of India.

Rao, M. Govinda and Mita Choudhury (2012), "Healthcare financing reform in India's decentralized healthcare system", in B. Clements, D. Cody and S. Gupta (eds.), *The Economics of Public Health Care Reform in Advanced and Emerging Economies*, International Monetary Fund, Washington, DC.

Rao, M. Govinda and Nirvikar Singh (2011), *Political Economy of Federalism in India*, Oxford University Press, New Delhi.

Srinath, Pavan, Pranay Kotasthane, Devika Kher and Aashish Chhajer (2017), "Public expenditure on health in India 2005-06 to 2014-15", report submitted to Public Health Foundation of India, New Delhi.

Chapter 5

Decentralised funding and inequality in education

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This chapter explores the link between the decentralisation of education funding to the local level and inequality in outcomes. In most countries, autonomous local taxes fund, at most, a small share of education expenses. They play a significant role, however, in a few Nordic countries and in Switzerland. The economic literature suggests that local funding makes educational systems more efficient at the expense of equity. However, inequality is not systematically larger in more decentralised countries. This finding does not appear to be driven by differences in socio-economic homogeneity, but rather by a range of policies that mitigate or offset any adverse impact. Some of these policies may still bear an equity-efficiency trade-off.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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Introduction

One of the central tenets of the fiscal federalism literature is that funding local services by local taxes enhances efficiency and accountability. Local voters are more likely to choose efficient provision levels when they pay the proper price. Local funding provides them with a financial incentive to monitor productive efficiency and to benchmark performance across jurisdictions. Moreover, households can sort across local jurisdictions to find a package of services and taxes that best suits their preferences, thus inducing competition in a market for local services (Tiebout, 1956). Capitalisation of the value of this package into local house prices provides homeowners with a further incentive to scrutinise local service production. Fischel (2001) reviews these arguments in depth for what is in many countries the most important local service: education.

In spite of these proclaimed advantages, local funding of education is a highly contentious issue, because of its potentially adverse impact on equity. Communities may vary in the amount of funds they dedicate to education, in accord with local preferences and incomes. Moreover, decentralisation of funding may incentivise communities to attract high-income families, which could bias the distribution of funds even further towards children of high-income families – rather than the needy. Such differences in funding may well reinforce differences in educational attainment.

Inequality in education outcomes matters. It affects income inequality and its transmission across generations, as well as broader outcomes such as health, crime and citizenship. Inequality may also harm macroeconomic growth, as the high and low-skilled complement each other in the aggregate economy (Benabou, 1996). Inclusiveness of the educational system is, therefore, a critical aspect of inclusive growth and from this perspective, it is essential to understand how institutional features such as decentralisation of funding affect inclusiveness.

Despite its social relevance, our empirical knowledge about the link between decentralisation of education funding and inequality in outcomes is limited. It has been studied most extensively in the United States, where a series of court-imposed reforms in school finance equalisation have created an opportunity to establish causal effects. Although this literature is not unequivocal, it tends to support the equity-efficiency trade-off that economic theory suggests: centralisation of school funding appears to have reduced efficiency of educational systems, while improving equity. However, there is no systematic evidence on the link between decentralisation of education funding and inequality in outcomes across countries. This chapter aims to fill that gap.

The basic idea of the chapter is to confront measures of inequality in education outcomes across OECD countries with information about the role of autonomous local taxes in funding education. The OECD Programme for International Student Assessment (PISA) readily provides a range of inequality measures. In order to construct a measure for the extent to which education is funded through local taxes on which local citizens really have a say, we combine information on the share of funds for public education that originates from the local level with information on the relative importance of local taxes and on local tax autonomy.

It turns out that in most countries, the role for autonomous local taxes in funding education is limited, but there are some notable exceptions. In contrast to what the economic literature predicts, we do not find a statistically significant positive relationship between decentralisation of funds and inequality in education outcomes. The education system appears to be equitable in several Nordic countries, in spite of being funded locally to a considerable degree. The same holds for Switzerland – albeit at the cantonal level.

Furthermore, countries in which funding is decentralised do not appear to be systematically more homogeneous in terms of the socio-economic background of students, nor do they necessarily spend more on education.

The next section provides a bird's eye view of the literature on the link between decentralisation and efficiency and equity of educational systems, with a particular focus on the US experiment in school finance centralisation. The third section discusses the measurement of the role of autonomous local taxes in funding education. This measure will be confronted with several measures of inequality in education outcomes in the fourth section, as well as with measures for socio-economic heterogeneity and education spending. The final section draws conclusions and discusses policies that may mitigate or offset any adverse impact of decentralisation on inequality.

Literature

Empirical evidence tends to support the notion that the decentralisation of tasks and funds to sub-national governments makes education systems more efficient. This literature generally relates measures of decentralisation to student performance. The underlying idea is that higher test scores indicate more productive efficiency, provided that other inputs are adequately controlled for in the framework of an education production function (Hanushek, 1986).

Studies at the cross-country level include Falch and Fischer (2012), Blöchliger, Égert and Bonesmo Fredriksen (2013) and Salinas (2014). These studies consider a range of decentralisation measures, with varying effects on education performance. One common thread is that the decentralisation of decision-making power is more important than the decentralisation of spending.[1] Salinas (2014) finds that a significant role for sub-national taxes, which gives sub-national governments more spending autonomy, reinforces the impact of decentralised decision making on education outcomes. Blöchliger, Égert and Bonesmo Fredriksen (2013) find that increasing the autonomy of schools serves as a substitute for decentralisation to sub-national governments, with similar effects on education performance.

A small number of studies that exploit variation in decentralisation measures within countries confirm the positive effect of decentralisation on student performance. The evidence based on court-imposed school finance reforms in US states, discussed in Box 5.1, is of particular interest in this respect because these reforms enable a clear identification of the effect of a precisely measured type of decentralisation. Barankay and Lockwood (2007) study differences across Swiss cantons in the share of education expenses shouldered by local governments and find that more decentralisation is associated with better student performance. Galiani, Gertler and Schargrodsky (2008) find that a transfer of schools from the central to the provincial level in Argentina has improved student performance – though not in the most impoverished places.

Turning to the impact of decentralisation on inequality, the evidence stems mostly from country-specific studies. The Galiani, Gertler and Schargrodsky (2008) study of the Argentina school reform clearly indicates that decentralisation may lead to a divergence in outcomes between rich and poor jurisdictions. Evidence from Borge, Brueckner and Rattso (2014), who study a reform in Norway that increased the spending discretion of local governments, points in the same direction. The reform made local service provision more responsive to local demand conditions, yet it also introduced a positive link between local income and the number of teachers per student. Evidence from the US experiment in school finance centralisation, discussed in Box 5.1, also tends to support the existence of an equity-efficiency trade-off.

Box 5.1. Court-mandated school finance reforms in the United States

Prior to the 1970s, primary and secondary education in the United States was mainly funded through local property taxes. In Serrano II, 1976, the California Supreme Court required equal public spending per pupil throughout the state. The apparent purpose was to reduce disparities in educational opportunity. This ruling had far-reaching consequences for school funding in California and the rest of the United States. The state legislature introduced a school finance equalisation system that disconnected local taxes from local school spending. Arguably as a result, voters drastically reduced local taxes and the educational system became mainly state-funded (Fischel, 2001). The California ruling inspired several other state supreme courts, which overturned school finance systems in 28 states between 1971 and 2010. The school finance equalisation schemes that these states introduced, however, varied in important dimensions and so did their impact on public school spending (Hoxby, 2001).

Notwithstanding differences in implementation across states, the overall effect of these court-imposed reforms was an equalisation and centralisation of school funding. The equalisation schemes weakened the link between local taxes and local school funds, limiting the ability of local communities to differentiate on school quality. Equalisation thus stifled competition between public schools, which may have made schools less efficient. A second channel through which these reforms may have impaired efficiency of the educational system is the increase in state regulation that came with a more significant share of state funds – at the expense of local autonomy. Husted and Kenny (2000) provide empirical support for both mechanisms.

While the promotion of equity was an important goal of the reforms, several mechanisms may have hampered its achievement. Besides the negative impact on overall school spending in some states, one fundamental issue with property tax based equalisation is that poor children do not necessarily live in property-poor districts, so the money is ill-targeted (Fischel, 2001). Another issue is that the redistribution of funds through equalisation will capitalise on property values, further offsetting the benefit to poor households who see their rents increased (Dee, 2000).

Nevertheless, Jackson, Johnson and Persico (2016) find that children of low-income households who benefited from court-mandated changes in funding experienced higher wages and less poverty in adult life. This suggests that overall, these reforms have been effective in reducing inequality and the intergenerational transmission of poverty. Similarly, Card and Payne (2002) find that court-mandated school finance reforms have reduced the gap in test scores between low- and high-income students. The evidence is not unequivocal, though, as other studies, such as Downes and Figlio (1998) and Husted and Kenny (2000), obtain mixed or insignificant results for the effect on the distribution of test scores.

We are not aware of any previous systematic analysis of the link between decentralisation and inequality in education outcomes at the cross-country level. There is some evidence on the link between competition between schools and stratification. Notably, OECD (2010) finds that competition strengthens the relationship between a school's average socio-economic background and the school's average student performance. OECD (2012a) provides a broader cross-country analysis of the determinants of equity in education, such as policies with regard to grade repetition and early tracking.

Measuring the role of local funding in education

This section develops a measure for the role of autonomous local taxes in funding education. Thus, while the literature considers a broad range of decentralisation measures, pertaining to the spending side, the revenue side, or decision-making power, the focus here is on the decentralisation of funding. Furthermore, we focus on the local level, as this is the level at which Tiebout competition and stratification are most likely to occur. After a descriptive analysis of the new measure, we will verify that local jurisdictions in countries where funding is strongly decentralised also have a significant say in education policies.

The section concludes with a brief analysis of the role of funding at the intermediate level for federal countries. Box 5.2 will zoom in on the role of local funding in Denmark.

In order to approximate the Tiebout setting in which local services are funded through local taxes as closely as possible, the share of public school funding that comes from local taxes on which local jurisdictions really have a say is considered. Alas, this share is not directly observed, so a proxy measure is constructed that takes account of the share of public school funding that comes from the local level, the share of local revenue that is raised through local taxes and the share of local taxes that local governments can influence. The underlying idea is that school funding is truly decentralised to the local level in countries in which all these shares are high, such as in the United States prior to the 1970s. The construction of this measure will now be discussed in detail.

The point of departure is the share of public funds for primary, secondary and post-secondary non-tertiary education that comes from the local government level. Private expenditure is ignored, although it constitutes an even more decentralised source than local public funding, because of its limited role in OECD countries.[2] Public funding data comes from OECD (2015). They refer to 2012 and distinguish the source of funding before and after taking account of intergovernmental transfers. Higher tiers of government often fund a considerable part of education expenditure at the local level through grants. In Canada, for example, local governments fund 86% of public education after taking account of transfers, but 75% of public education funds originate from the provinces. As these grants are earmarked for education, they limit local discretion on expenditure. Furthermore, in such cases, it is likely that these higher tiers of government also have a significant say in education policy. We, therefore, consider the share of public education that is funded from local resources and not from earmarked intergovernmental transfers. Local spending on schools that is not covered by education grants must be funded through local taxes, general grants, or other sources of revenue. Local governments will generally exercise more discretion over these funds, and local voters are more directly confronted with the costs.

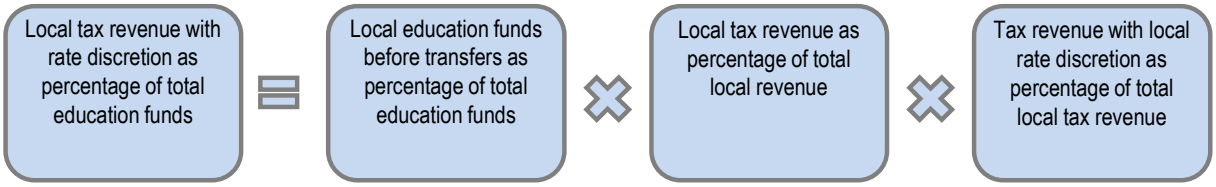
This measure does not yet suit our purposes, however, because when local governments fund public education through general grants, the pay check is still passed on to taxpayers at higher tiers of government. Furthermore, local governments tend to spend general grants, rather than passing them on to residents through a tax cut, a phenomenon well known as the "flypaper effect".[3] Hence, funding through general grants still effectively hampers local spending discretion, and it impairs the local trade-off of benefits and costs that is at the heart of the Tiebout model. It is therefore widely believed to reduce the accountability and efficiency of local service provision (Rodden, 2003; Oates, 2005).

The share of local education funds that comes from local taxes may be gauged by considering local tax revenue as a percentage of total revenue at the local level. The *OECD Fiscal Decentralisation Database* provides this information on the basis of National Accounts.[4] For most countries, it is available for 2012. By multiplying this share with the share of public education funds that originates from the local level, a proxy is constructed for the share of public education that is funded through local taxes. In practice, one cannot say how local governments allocate revenue sources over expenditure items, so this measure should be interpreted with caution. Still, a high value indicates that a significant share of public education funds comes from the local level and that local governments fund a significant share of local expenditure with local taxes.

Even if local governments fund a significant share of education with local taxes, however, they still cannot raise the quality of local education and pass the bill to local voters, or cut expenses and local taxes, without a certain measure of tax autonomy. In

Norway, for example, a significant share of public education funding originates from local governments that are in turn mainly funded through local taxes, yet in practice, municipalities have no tax autonomy as all set the same rates. Hence, we construct the share of local taxes on which local governments have some rate discretion, using information on local tax autonomy from the *OECD Fiscal Decentralisation Database*.[5] Multiplication with the share of education funds from local taxes yields a proxy for the share of education funds from autonomous local taxes – as illustrated in Figure 5.1. This proxy takes on high values in countries where local governments fund a significant share of public education, where local taxes are an important source of local revenues and where local governments have considerable revenue autonomy. We, therefore, interpret a high value as indicating a significant role for local funding in education, which facilitates Tiebout competition.

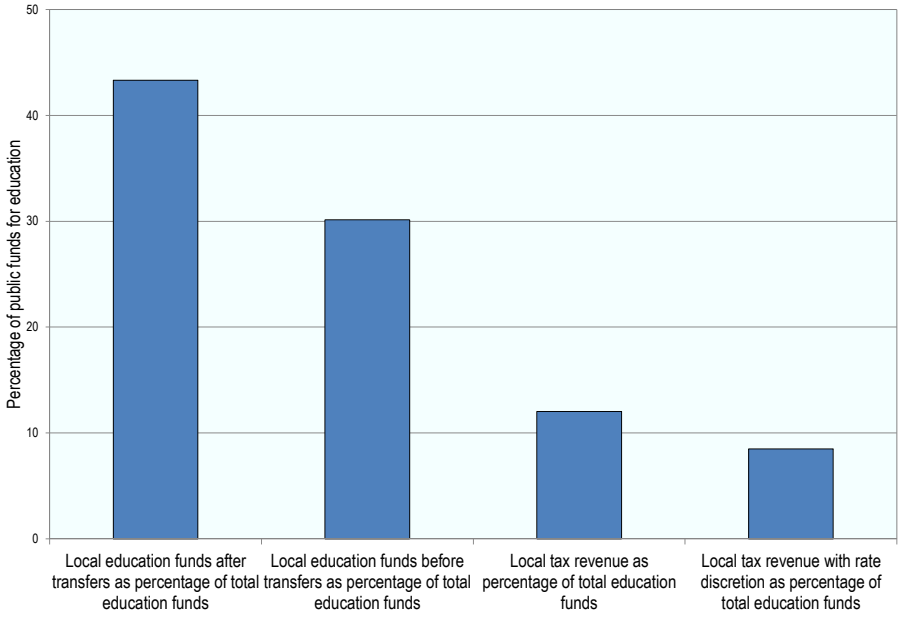
Figure 5.1. **A proxy for the share of local funding in education**



Source: Author's elaboration.

Turning to a descriptive analysis, Figure 5.2 illustrates how the share of local funding in education, averaged over all countries for which our funding data are complete, declines once stricter criteria are imposed – the underlying data are reported in Annex Table 5.A1.1. When intergovernmental transfers are taken into account, almost half of all public funds for primary, secondary and post-secondary non-tertiary education comes from the local level. This share drops by more than 10 percentage points if we only consider funds that originate from the local level. An even more substantial drop occurs when we multiply this share with the share of local revenue that is covered by local taxes. On average, the revenue of local taxes subject to local rate discretion accounts for less than 10% of public education funds, in our approximation. The reality in many countries thus appears to be far removed from the Tiebout world in which local taxes fund local services, and local voters have a say in both. The US pre-1970 setting turns out to be the exception rather than the rule.

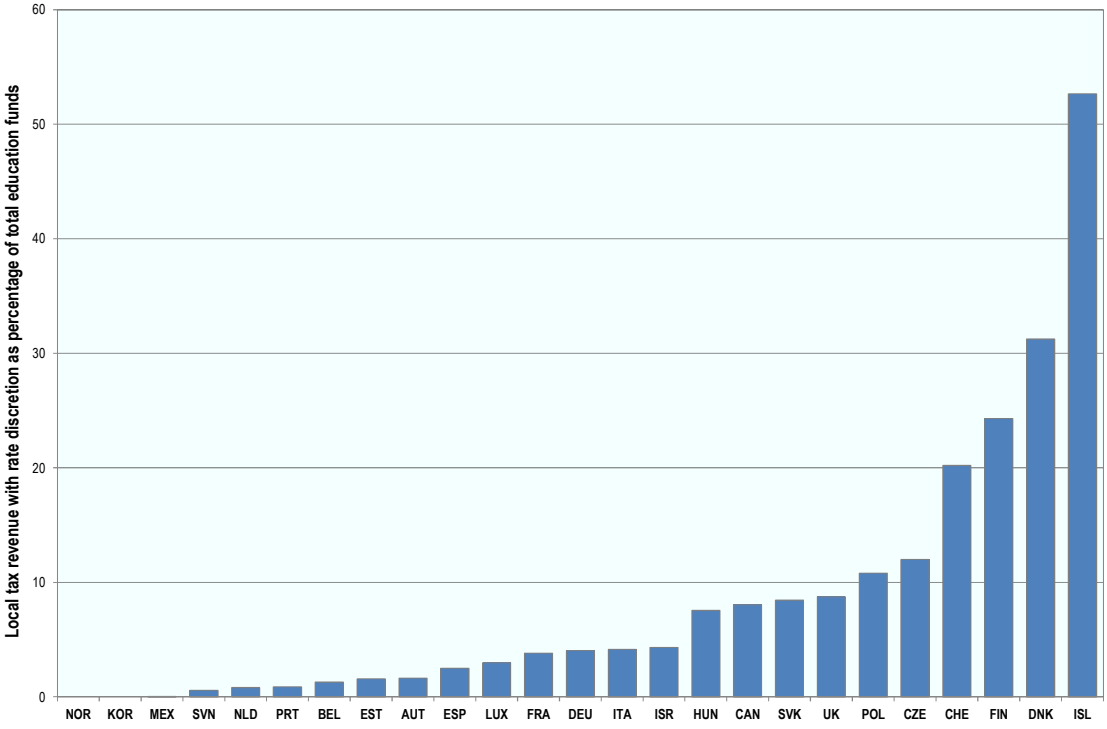
Figure 5.2. **The role of local funding in education**



Source: Author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Even if the role of autonomous local funding appears to be small in general, there is meaningful variation across countries. Figure 5.3 illustrates that in some countries, the role of local funding is considerable. In Iceland in particular, about three-quarters of public funds for education originate from local governments, which in turn obtain three-quarters of their revenues from local taxes on which they have discretion. In Denmark and Finland, autonomous local taxes fund about one-third of public education expenditure according to our proxy measure, so the role of local funding is still substantial. Even for these countries, though, a large role of autonomous taxes does not necessarily imply fierce Tiebout-style competition at the local service. Local taxation in Denmark, for example, is still characterised by a considerable degree of co-ordination. Box 5.2 provides more background on public education funding and local taxation in this country.

Figure 5.3. **The role of autonomous local taxes across countries**



Source: Author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Box 5.2. **How local is education funding in Denmark?**

Denmark is amongst the most fiscally decentralised countries in the OECD area and providing primary and lower secondary education is one of the core tasks of the municipalities. Almost all public funds for education originate from the local level, while municipalities obtain about one-third of their revenue from autonomous local taxes – of which the income tax is the main component. This means that the central government still shoulders the more significant part of education expenses, albeit indirectly through general grants.

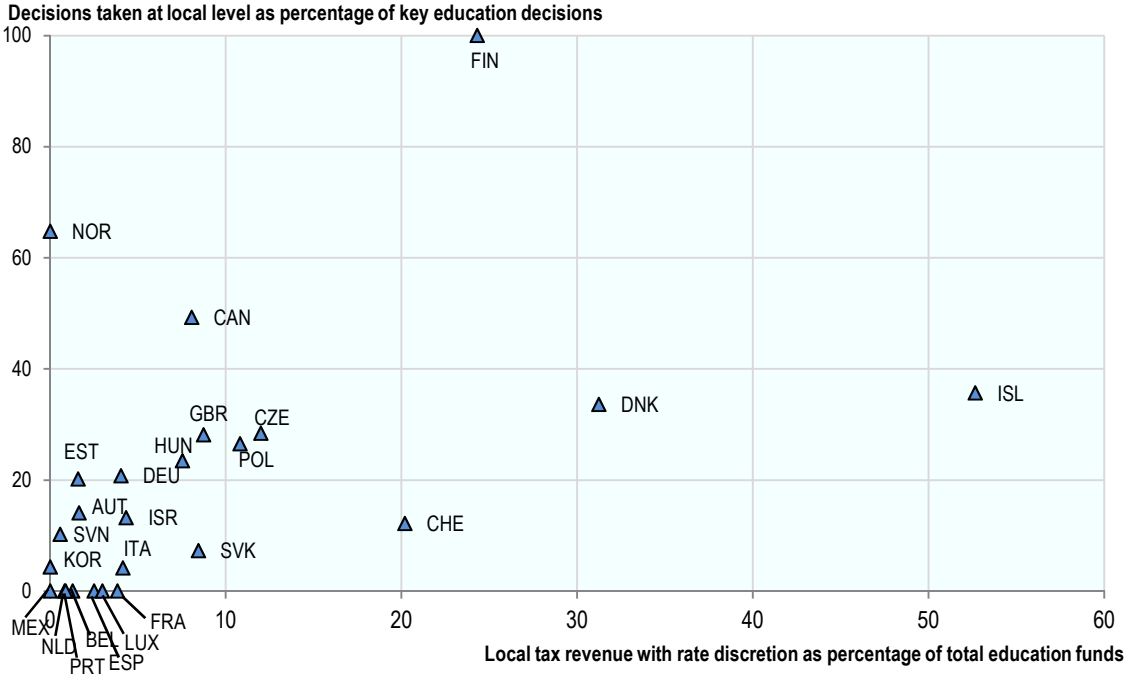
The considerable share of local expenses that is funded through local taxes has the potential to function as a powerful source of fiscal discipline, incentivising municipalities to provide an attractive service and tax package. In practice, however, tax competition appears to play a small role. In annual negotiations with the central government, local associations agree to recommend to their members to keep tax rates and expenditure increases within specified limits. In the wake of the financial crisis of 2008, the central government enforced these agreements by making general grants conditional on municipal compliance. This has arguably led to a "tax freeze" that effectively eliminated local tax autonomy (Lotz, Blom-Hansen and Hartmann Hede, 2015).

Moreover, it appears that municipalities do not compete on school quality either. While the performance of students, schools and municipalities is monitored through national tests, the results of these tests are confidential. Thus, municipalities cannot benchmark themselves against other municipalities; school leaders cannot compare themselves to other schools and parents cannot compare different schools' average test results (Houlberg et al., 2016). This serves to illustrate just how far reality stands apart from the Tiebout model of competition on tax and service levels – even in a highly decentralised country like Denmark.

It does not make much sense to accord a large role to autonomous local taxes if local governments have little influence on education policy. Hence, as a check on the proxy measure for the role of local funding, we verify that it goes hand in hand with local decision-making power on education matters. OECD (2012b) documents where key decisions are made in public institutions at the lower secondary level of education, distinguishing different tiers of government and the school level.[6] It considers a representative set of 46 key decisions in the four broad domains of the organisation of instruction, personnel management, planning and structures and resource management. The data refer to 2011. We consider the share of decisions that is taken at the local level. A low share does not necessarily mean that school policy is centralised, because it may also result from a significant degree of school autonomy, yet this measure suits our purposes, as we are interested in the extent to which decision-making power at the local level coincides with local funding.

Figure 5.4 scatters the share of decisions taken at the local level against our proxy measure for the share of public education funded by autonomous local taxes. It indicates that the two tend to go hand in hand – the correlation coefficient is 0.45 and it is statistically significant at the 5% level. Finland, Denmark and Iceland stand out as countries in which local governments have a comparably large say in both education policy and funding. The next section will therefore explore how these countries perform on equity aspects.

Figure 5.4. **Local funding and local decision-making power tend to go hand in hand**



Source: OECD (2012b), *Education at a Glance 2012: OECD Indicators,* http://dx.doi.org/10.1787/eag-2012-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

While measures have been constructed for the decentralisation of funds and for decision-making power at the lowest local level available, the intermediate level in federal countries often plays a vital role in education funding and policy as well. For these countries, Annex Table 5.A1.2 reports the share of public education expenditure funded with autonomous taxes at the intermediate level and the share of decisions made at this level, using the same sources and approach as for the local level. It indicates that of the countries for which our data are complete, autonomous taxes at the intermediate level play a significant role only in Canada, Spain, Switzerland and the United States. Of these countries, only the cantons in Switzerland would appear to be small enough to enable Tiebout competition.[7] The Swiss cantonal level funds one-third of public education through autonomous taxes and it takes about 60% of decisions. If we add the share of autonomous taxes and decisions from the local level, it turns out to be one of the most decentralised countries in our sample. Moreover, tax competition across Swiss jurisdictions could well be stronger than in Nordic countries like Denmark.

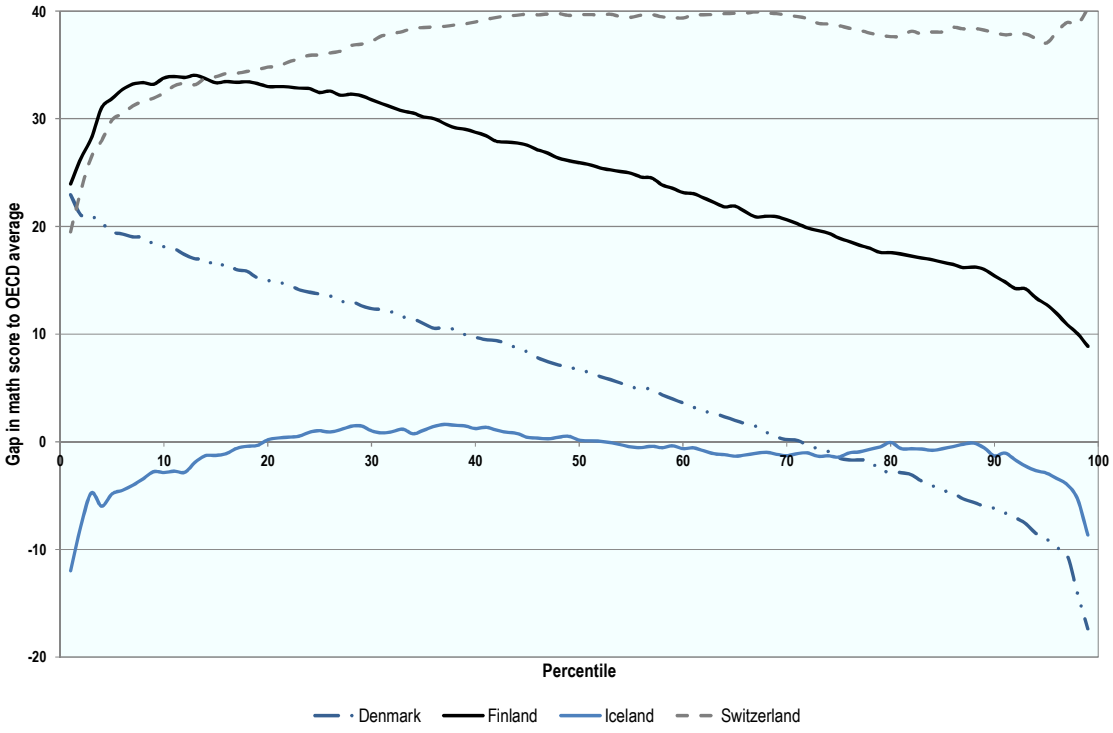
Wrapping up this section, we observe that the new proxy measure for the role of autonomous local funding in education indicates that this role is small in most countries, but considerable in a few critical exceptions – which include Switzerland if one also considers the cantonal level. Reassuringly, the decentralisation of funds according to this measure appears to go hand in hand with the decentralisation of decision-making power to the local level. The next section confronts the role of local funding with measures for inequality in education outcomes.

Results from a confrontation with inequality measures

Inequality in education outcomes is explored on the basis of the OECD Programme for International Student Assessment (PISA). PISA is a triennial international survey which aims to evaluate education systems world-wide by testing the skills and knowledge of 15-year-old students. Outcomes at this age presumably reflect features of both primary and secondary education systems. We use the 2012 results because our decentralisation measures are based on data for this year as well. Around 510 000 students in 65 countries participated in PISA 2012. The survey focused on competencies in mathematics, so in this chapter, we will focus on outcomes for mathematics, too.

Figure 5.5 plots the distribution of math scores relative to the OECD average for Denmark, Finland, Iceland and Switzerland – the countries identified as most decentralised in the previous section. For each percentile of the outcome distribution, the figure shows the difference between test scores for these selected countries and the OECD average. So, for example, the worst performing 1% of students in Iceland score 12 points below the worst performing 1% in all OECD countries. The best performing 1% of students in Switzerland score 40 points higher than the best performing 1% of students in the OECD area.[8]

Figure 5.5. **Gap to OECD average in math scores by percentile in four decentralised countries**

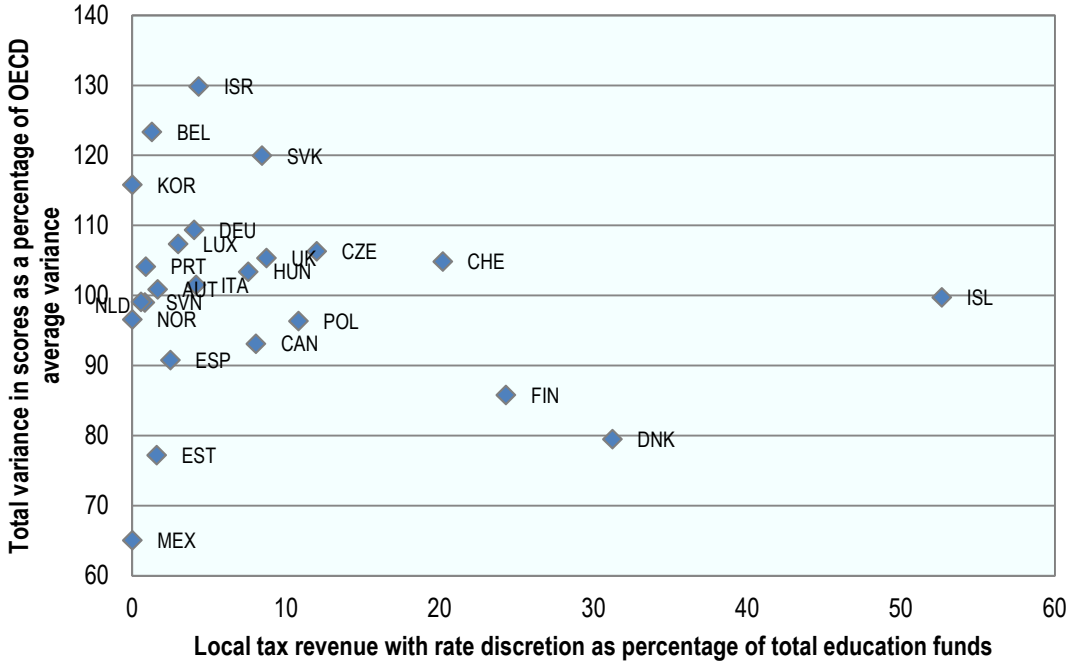


Source: Author's calculations based on PISA 2012, http://www.oecd.org/pisa/pisaproducts/pisa2012database-downloadabledata.htm.

The figure shows that Switzerland outperforms the OECD average over the entire distribution. However, the gap is smaller for students at the lower end than for students who perform above average. This suggests that the Swiss educational system is more geared towards better-performing students and in this sense, it is less equitable. The reverse holds for Denmark and Finland: students at the top of the distribution outperform the OECD by less than students at the bottom, which suggests that educational systems in these countries do relatively well for low achievers. Of course, these differences across countries may also reflect the composition of the student population in terms of talent and background. Nevertheless, Figure 5.5 does not provide *prima facie* evidence for a systematic positive relationship between decentralisation of funding and inequality – the distribution of math scores is consistent with this prediction for only one out of four countries.

Figure 5.6 scatters the variance in outcomes relative to the OECD average variance against our proxy measure for the share of education funds from autonomous local taxes – where for Switzerland, we consider the role of autonomous funding at the local rather than the cantonal level for reasons of consistency. Variances in outcomes are directly related to the slopes of the distributions in Figure 5.5: if test scores relative to the OECD average decline for better-performing students, then the spread in outcomes must be smaller than in the OECD as a whole. Indeed, the figure shows that the spread in outcomes in Iceland equals the OECD average, whereas it is slightly higher in Switzerland and considerably lower in Finland and Denmark. No systematic relationship with the role of local funding appears. Countries in which funding is highly centralised may have either a much larger (Israel, Belgium, the Slovak Republic) or a smaller spread in outcomes (Estonia, Mexico). This suggests that other determinants of equity in education are far more important.

Figure 5.6. **Does local funding raise the variance in outcomes?**

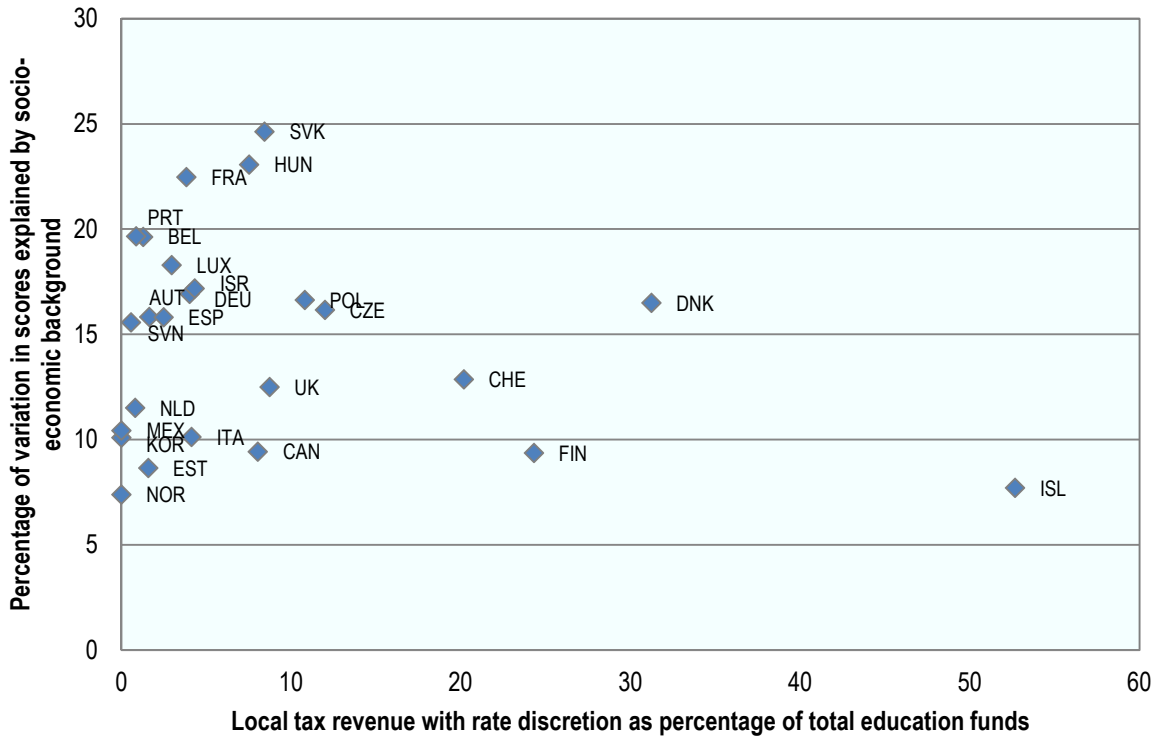


Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

It is important to realise that the spread in outcomes is only one of various ways to measure inequality. In particular, OECD (2013) defines equity in education as providing all students, regardless of gender, family background or socio-economic status, with similar opportunities to benefit from education. In this definition, a stronger relationship between a student's socio-economic status and his or her performance indicates a less equitable school system. Countries may have a large spread in outcomes yet provide access to education independent of a student's status, so the two measures complement each other.

Figure 5.7 scatters the percentage of variation in math scores that is explained by the PISA index of economic, social and cultural status against the share of education funds from autonomous local taxes. This index is based on indicators such as parental education and occupation, the number and type of home possessions that are considered proxies for wealth, and the educational resources available at home. It is built to be internationally comparable (OECD, 2013). The figure does not indicate a systematic relationship between decentralisation and inequality. Notably, Finland and Iceland are amongst the most equitable countries according to this measure, and in Denmark, socio-economic status explains just slightly more than the OECD average of 15% of the variance in outcomes. In most countries, the role of local funding in education is rather limited, yet the equity measure varies considerably – from 7% in Norway to 25% in the Slovak Republic.

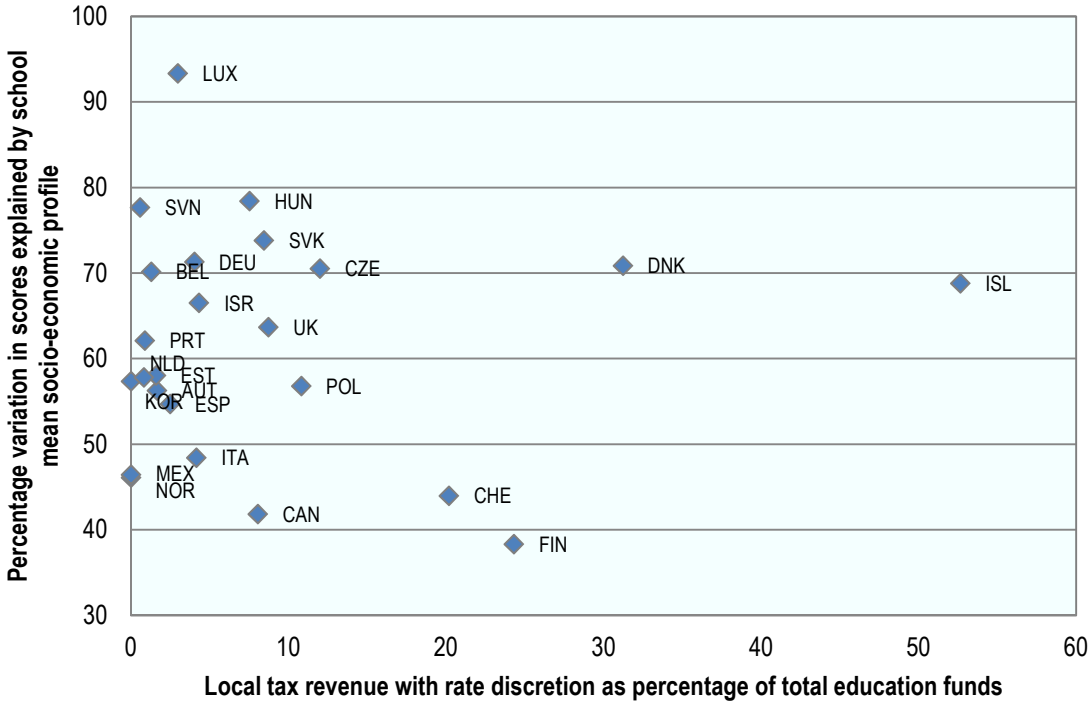
Figure 5.7. **Does local funding raise inequality?**



Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Yet another way to look at inequality is provided by the between-school strength of the relationship between student performance and socio-economic status. This viewpoint is particularly relevant in the context of decentralisation: a strong link indicates that privileged students have access to better schools – a pattern that may well arise in decentralised settings, in which affluent communities dedicate more funds to education. Hence, Figure 5.8 scatters the percentage of variation in math scores explained by the school average PISA index against the share of education funds from autonomous local taxes.[9] Again, no systematic relationship is apparent. In Denmark and Iceland, this share exceeds the OECD average of 63%, yet Switzerland and Finland are amongst the most equitable countries according to this measure.

Figure 5.8. **Does local funding raise between-school inequality?**



Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Table 5.1 displays correlations between the three decentralisation measures and the share of education funds from autonomous local taxes. It also reports p-values between brackets. A p-value below 0.05 indicates that the relationship is statistically significant at the 5% level, i.e. absence of a systematic relationship has a probability smaller than 5%. As inferred from Figures 5.6 to 5.8, there is no statistically significant relationship between the share of education funds from autonomous local taxes and any of the inequality measures. The limited number of observations on which these correlations are based should, of course, be borne in mind.

In order to verify the robustness of this result for measurement of the decentralisation of funding, correlations of the inequality measures with alternative decentralisation measures are also shown in Table 5.1. In particular, we consider the four measures shown in Figure 5.2, on which we impose increasingly strict criteria for the role of local funding. Correlations are generally statistically insignificant.[10] Only the share of variation in math scores explained by socio-economic status at the student level appears to relate (borderline) significantly to the share of education funds originating from the local level and to local tax revenue as a percentage of total education funds. However, virtually all correlations are negative, suggesting that more decentralised countries are less unequal – rather than more. These results are driven by Iceland, which is highly decentralised and where socio-economic background plays a comparably limited role.

Table 5.1. **Correlations between decentralisation and inequality measures**

	Total variance in scores as a percentage of OECD average variance	Percentage of variation in scores explained by socio-economic background	Percentage variation in scores explained by school mean socio-economic profile
Local education funds after transfers as percentage of total education funds	-0.21 (0.26) *n* = 30	-0.23 (0.22) *n* =31	-0.27 (0.14) *n* =30
Local education funds before transfers as percentage of total education funds	-0.22 (0.24) *n* =30	-0.29 (0.11) *n* =31	-0.23 (0.22) *n* =30
Local tax revenue as percentage of total education funds	-0.21 (0.31) *n* =25	-0.37 (0.06) *n* =26	-0.18 (0.38) *n* =25
Local tax revenue with rate discretion as percentage of total education funds	-0.15 (0.47) *n* =24	-0.22 (0.29) *n* =25	0.01 (0.98) *n* =24

Note: The table shows pairwise correlations, p-values between brackets and the number of observations *n*.

Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

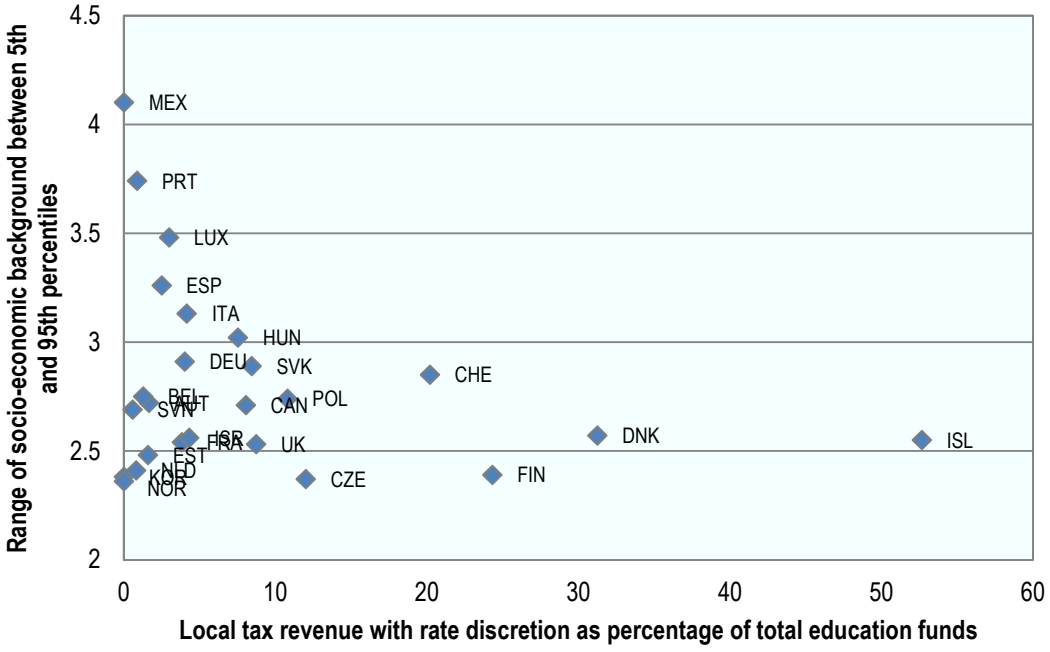
The correlations reported in Table 5.1 do not rule out a causal link between decentralised funding and inequality, as they may be driven by other factors. Any factor that relates systematically to both the role of local funding and inequality in education outcomes would bias the relationships inferred from this table. In particular, inequality in education outcomes may be driven by the overall level of inequality in society – as relected for instance in the dispersion of disposable household incomes, the generosity of social support systems, or the degree of spatial income segregation – and both may be the result of egalitarian preferences. If more egalitarian countries would tend to be more decentralised, the correlations in Table 5.1 underestimate the true relationship. Inequality would be low here, not because there is no effect from decentralisation, but because this effect is offset by a high overall level of equality, and more inequality could result if these countries would choose to decentralise the funding of schools even further – while holding other policies constant.

Socio-economic heterogeneity in student populations, as measured by the range of the PISA index of economic, social and cultural status between the 5th and 95th percentiles, provides an indication of the overall level of inequality in a country. It correlates positively and statistically significantly with the share of variation in math scores that is explained by socio-economic status: socio-economic status tends to matter more in countries in which students vary more in background.[11] The question is, however, whether socio-economic heterogeneity is also systematically smaller in more decentralised countries.

Figure 5.9 scatters the range of socio-economic background between the 5th and 95th percentiles against the share of education funds from autonomous local taxes. Denmark, Finland and Iceland are indeed comparably homogeneous. This finding supports the idea that inequality in outcomes may be comparably small in these countries in spite of decentralised funding and that inequality in outcomes would have been more significant in more heterogeneous countries with a similar level of decentralisation. However, heterogeneity in Switzerland is slightly above the OECD average of 2.83, and yet, inequality measures are near or below the OECD average. Moreover, the variation in heterogeneity across countries in which funding is more centralised is considerable. In

Korea, for instance, local funding plays a negligible role, yet it is more homogeneous than the Nordic countries. Hence, more decentralised countries do not appear to be systematically more or less heterogeneous in terms of socio-economic background.[12] The evidence thus does not point to differences in socio-economic heterogeneity in student populations as the explanation for the absence of a systematic positive relationship between decentralisation of funding and inequality in education outcomes.

Figure 5.9. **Are decentralised countries more homogeneous?**



Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Table 5.2 shows partial correlations of the three inequality measures discussed in this chapter with the share of education funds from autonomous local taxes, after accounting for the effect of socio-economic heterogeneity. They confirm the message derived from Figure 5.9: the relationship between decentralisation and inequality does not turn positive and statistically significant once socio-economic heterogeneity is held constant. Israel illustrates this point well: it is about as homogeneous as the three Nordic countries, funding is considerably more centralised, yet there is more inequality in outcomes.

Table 5.2. **Partial correlations between local funding and inequality measures**

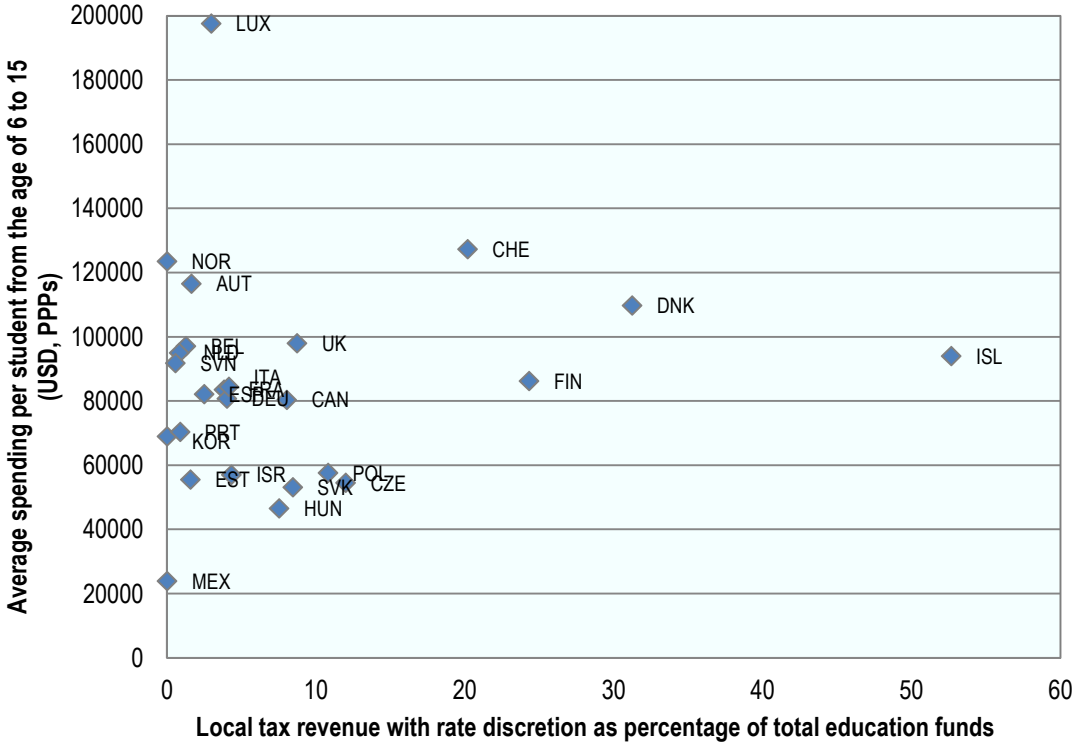
	Total variance in scores as a percentage of OECD average variance	Percentage of variation in scores explained by socio-economic background	Percentage variation in scores explained by school mean socio-economic profile
Range of socio-economic status between the 5th and 95th percentiles partialed out	-0.23 (0.29) *n* = 24	-0.17 (0.43) *n* =25	0.03 (0.90) *n* =24
Spending per student from the age of 6 to 15 partialed out	-0.17 (0.44) *n* =24	-0.21 (0.32) *n* =25	-0.02 (0.93) *n* =24

Note: The table shows partial correlations between inequality measures and local tax revenue with rate discretion as a percentage of total education funds, p-values between brackets and the number of observations *n*.

Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Spending is another factor that may confound the relationship between decentralisation and inequality. Do more decentralised countries simply spend more on their students and does this account for less inequality in outcomes? Figure 5.10 scatters average spending per student from the age of 6 to 15, obtained from OECD (2013), against the share of education funds from autonomous local taxes. Spending appears to be high in Denmark and particularly high in Switzerland, yet there is again no systematic link with the role of local funding. In fact, spending is neither significantly correlated with the role of local funding, nor with inequality – as measured by the share variation in math scores that is explained by socio-economic background.[13] Table 5.2 verifies that controlling for education spending does not alter the main finding of this chapter that there is no positive and statistically significant relationship between decentralisation and inequality across countries.

Figure 5.10. **Do decentralised countries spend more on education?**



Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

It should be stressed, however, that these partial correlations provide only a crude check for variables that confound the relationship between decentralisation and inequality. Obviously, the small number of observations limits the statistical power to separate out the effects of different variables. More fundamentally, inequality in education outcomes may be shaped by a myriad of factors, and it is impossible to account for all of them. The analysis of changes in decentralisation and inequality over time may partly overcome these limitations. Alas, the distribution of funds and tasks over different government layers is rather inert – in most countries, the share of education funds from autonomous local taxes has hardly changed since 2000, when PISA was first carried out. One example of a country where local governments did obtain a more significant role in funding and determining education policy in recent years is Norway. Box 5.3 documents that, consistent with the primary finding in this chapter, inequality in outcomes does not seem to have increased as a result.

Box 5.3. **Decentralisation of decisions and funds in Norway**

While in most countries not much has changed over the past 20 years in the distribution of decisions and funds over different layers of government, Norway is an interesting exception. Local governments took 32% of key education decisions in 2003 and 62% in 2011 (OECD, 2008, 2012b). Moreover, in 2002, 43% of public funds for education originated from the local level, whereas in 2012 this share rose to 92% (OECD, 2005, 2015). This shift in decisions and funds is driven by several reforms. Notably, municipalities became responsible for negotiating teachers' pay and work-time agreements in 2004 – although negotiations remained quite centralised. Municipalities received a lump sum grant for teacher salaries. The Knowledge Promotion Reform in 2006 introduced a new outcomes-based curriculum while transferring autonomy on how to attain these outcomes to the local level (Nusche et al., 2011).

These reforms provide an excellent opportunity to investigate the link between decentralisation and inequality in education outcomes because they allow for a comparison between two different settings in the same country. Many factors that influence both decentralisation and inequality, such as the overall level of social inequality in Norway, will have remained more or less constant between 2003 and 2012. This mitigates the risk that the observed relationship between decentralisation and inequality is driven by other factors – although changes in other policies or in the composition of the population of students may still confound empirical findings.

OECD (2013) explores trends in equity between PISA 2003 and PISA 2012. It documents that equity in Norway, as measured by the strength of the relationship between math scores and socio-economic background, has improved notably over this period. The percentage of variation explained by the PISA index of economic, social and cultural status dropped by 5 percentage points. Only a handful of countries registered a steeper drop in inequality according to this measure. The average math score, however, also fell slightly over the same period.

The Norwegian case thus confirms the overall message of this chapter that decentralisation does not have to come at the expense of equity. It also illustrates how decentralisation may go hand in hand with a continued significant role of the central government. The Knowledge Promotion Reform, for example, increased local decision-making power while at the same time stepping up on national outcome targets and their monitoring. Some other reforms in the same period also strengthened the role of the central government. This may well help to explain why equity did not deteriorate as a consequence of decentralisation.

Conclusion

This chapter has explored the link between decentralised funding of education and inequality in outcomes across countries. Although local governments fund almost half of all public expenditure on primary, secondary and post-secondary, non-tertiary education, they obtain most of these funds through earmarked or general grants. The role of taxes on which local governments have a say is small – less than 10% according to a crude approximation. This sets the reality in many countries far apart from the Tiebout world in which local taxes fund local services, and local voters have a say on both – higher tiers of government pay the lion's share of the check, either directly or indirectly.

There are a few countries, however, in which the role of local funding is considerable. The United States provides one of the best examples – mainly before the school finance reforms of the 1970s. In the data, Denmark, Finland and Iceland stand out. Notably, about three-quarters of public funds for education in Iceland originate from local governments, which in turn obtain three-quarters of their revenues from local taxes over which they have discretion. Local governments in these countries also have a large say on education policy. In Switzerland, funding and decision-making power are also highly decentralised at the cantonal level – which may still be small enough to foster Tiebout competition. Hence,

although autonomous local taxes generally fund a limited share of education expenses, there is meaningful variation across countries in the extent to which school funding is decentralised.

A cross-country comparison does not reveal that, as a rule, more decentralised countries are less equal. We consider the variation in PISA scores, the importance of socio-economic background in explaining performance and the between-school strength of the link between performance and background as inequality measures. This last measure may be particularly relevant, as we would expect more privileged students to end up in better schools in a decentralised setting. However, in none of these measures do the three Nordic countries or Switzerland appear particularly unequal. The same measures do vary considerably across countries in which funding is more centralised, indicating that there are more important determinants of inequality than the role of local funding. These findings stand in contrast to a small number of studies of the link between local funding and inequality in specific countries – notably the United States, where the centralisation of school funding does appear to have contributed to more equal outcomes.

The existence of a causal link between decentralisation and inequality cannot be ruled out on the basis of our findings, however, as the observed cross-country correlation between decentralisation and inequality may be driven by a myriad of confounding factors. Differences across countries in how heterogeneous the student population is in terms of socio-economic background and other policies that affect inequality are two obvious candidates. A positive link between decentralisation and inequality could arise once these, or other relevant factors are appropriately taken into account.

With regard to the heterogeneity of the student population in terms of socio-economic background, a crude exploration does not reveal a systematic link with the role of local funding. Denmark, Finland and Iceland are comparably homogeneous societies, but Switzerland is slightly more heterogeneous than the OECD average. There is a large spread in the heterogeneity of socio-economic background across countries in which local funding plays a limited role. This explains why accounting for heterogeneity does not lead to a systematic positive link between decentralisation and inequality. Similarly, accounting for the amount that governments spend on students from the age of 6 to 15 does not change our findings.

This chapter does not test the role of other policies in mitigating the potentially adverse effects of decentralised school funding on inequality. However, we expect the role of other policies to be significant and we proceed to discuss a number of candidates. First of all, higher tiers of government may set targets for student achievement and monitor them through central examinations, while delegating decisions on how to attain them to the local level. In Denmark, for example, so-called Common Objectives specify the knowledge and skills students have to acquire at different form levels in each subject and national tests monitor the attainment of these targets (Houlberg et al., 2016). This type of decentralisation, in which local governments provide social services according to centrally determined objectives rather than catering to local tastes, is sometimes referred to as the Nordic model of administrative federalism (Rattsø, 1998).

The responsiveness of funding schemes to local needs is another element of likely importance. Higher tiers of government may compensate for the local composition of the student population – or local governments may engage in a horizontal equalisation scheme. Fiscal equalisation can be based on broad measures for socio-economic composition or on the number of students with specific needs in a more fine-grained manner. Its impact on local spending on disadvantaged or needy students will depend on the design of the funding scheme and the magnitude of the compensating amounts. Obviously, equalising grants and

regulations on how to spend them reduce the role of autonomous local funding. The descriptive analysis in this chapter suggests that a considerable role for local funding is compatible with an equitable educational system. However, in none of the countries in our dataset is the role of local funding so significant that it rules out substantive fiscal equalisation. As an illustration, Iceland, where autonomous local funding appears to play the most considerable role, still has a sizeable equalisation fund that evens out the difference in income and expenditure of more prosperous or needy local communities (Iceland Ministry of Education, Science and Culture, 2014).

Equity in education outcomes is also influenced by other policies that do not directly relate to the decentralisation of responsibilities and funds. For example, OECD (2012a) recommends to eliminate grade repetition and to avoid early tracking. The Nordics do well in this respect: the percentage of 15-year-old students who have repeated at least one year in Denmark, Finland and Iceland is far below the OECD average, and the first selection of educational track only takes place at the age of 16 in these countries. Such policies may well offset any adverse effect of decentralised funding on equity. Switzerland, in contrast, has a comparably high percentage of grade repetition and selection of educational track already takes place at the age of 12. Hence, late tracking and the elimination of grade repetition do not appear to be necessary conditions for equitable outcomes in decentralised countries.

Summing up, a range of policies exists that has the potential to mitigate or offset any adverse impact of decentralised school funding on inequality. The effectiveness of these policies is an important empirical question, which is beyond the scope of this chapter. Another critical empirical question is the degree to which such policies impair the efficiency gains of decentralised funding. Centrally imposed targets and equalisation schemes, for example, may limit the possibility for local governments to compete on quality or costs. Expenditure on education is not necessarily lower in more decentralised countries. Hence, countries that attribute a significant role to local funding may still face equity-efficiency trade-offs in the design of this decentralisation.

Notes

1. This is not to say that all decisions should be delegated to sub-national governments or schools. In particular, Woessmann (2005) cautions that central examination, aligning local incentives with national objectives, is an important precondition for the beneficial effects of decentralisation.

2. In 2012, public funds covered more than 90% of primary, secondary and post-secondary non-tertiary education expenses in the OECD on average and more than 80% in every single OECD country (OECD, 2015).

3. See, e.g. Dahlberg et al. (2008), Lundqvist (2015), or Allers and Vermeulen (2016) for recent evidence on the flypaper effect for general grants.

4. See www.oecd.org/ctp/federalism/fiscal-decentralisation-database.htm. Caution is warranted as in these data, all sub-national revenues and taxes are lumped together for unitary countries. This is not the case for the data on the source of public funds for education, so the government tiers to which these data sources refer are not always congruent.

5. In Japan, Korea and Norway, this percentage is set to zero, because local jurisdictions have formal autonomy over tax rates, yet in practice they all set the same rate.

6. We have set the percentage of decisions taken at the local level to zero when the category local government did not apply or its magnitude was indicated as either negligible or zero. Since this was the case in both Flanders and Wallonia, I have merged these observations, as Belgium appears as a single country in other data. For the United Kingdom, I take the average of England and Scotland.

7. Changing US states or Canadian provinces would usually require parents to change jobs, which raises the cost of opting for a different package of school quality and taxes considerably. Distances between Swiss cantons are much smaller.

8. Mathematics performance is scaled such that in 2003, when it was first assessed, it had a mean of 500 score points and a standard deviation of 100 score points.

9. Socio-economic status at the student level is held constant in the computation of the percentage of variation in math scores explained by the school average PISA index, so it does not pick up the effect of socio-economic status on math scores at the individual level (OECD, 2013).

10. Adding funding at the cantonal level for Switzerland would not yield any positive and statistically significant correlation in Table 5.1, as outcomes in this country are not more than averagely unequal.

11. The correlation is 0.34 with a p-value of 0.05, based on 35 observations.

12. The correlation is -0.26 with a p-value of 0.30, based on 25 observations.

13. The correlation of average spending per student from the age of 6 to 15 with the share variation in math scores that is explained by socio-economic background equals -0.17 with a p-value of 0.34, based on 34 observations. The correlation with the share of education funds from autonomous local taxes equals 0.11 with a p-value of 0.60, based on 25 observations.

References

Allers, M.A. and W. Vermeulen (2016), "Capitalization of equalizing grants and the flypaper effect", Regional Science and Urban Economics 58, pp. 115-129.

Barankay, I. and B. Lockwood (2007), "Decentralization and the productive efficiency of government: Evidence from Swiss cantons", Journal of Public Economics 91, pp. 1197-1218.

Benabou, R. (1996), "Heterogeneity, stratification, and growth: Macroeconomic implications of community structure and school finance", American Economic Review 86, pp. 584-609.

Blöchliger, H., B. Égert and K. Bonesmo Fredriksen (2013), "Fiscal federalism and its impact on economic activity, public investment and the performance of educational systems", OECD Economics Department Working Papers, No. 1051, OECD Publishing, http://dx.doi.org/10.1787/5k4695840w7b-en.

Borge, L.E., J.K. Brueckner and J. Rattso, (2014), "Partial fiscal decentralization and demand responsiveness of the local public sector: Theory and evidence from Norway", Journal of Urban Economics 80, pp. 153-163.

Card, D. and A.A. Payne (2002), "School finance reform, the distribution of school spending, and the distribution of student test scores", Journal of Public Economics 83, pp. 49-82.

Dahlberg, M. et al. (2008), "Using a discontinuous grant rule to identify the effect of grants on local taxes and spending", Journal of Public Economics 92, pp. 2320-2335.

Dee, T.S. (2000), "The capitalization of education finance reforms", Journal of Law & Economics 43, pp. 185-214.

Downes, T.A. and D. Figlio (1998), "School finance reforms, tax limits, and student performance: Do reforms level up or dumb down?", University of Wisconsin, mimeo.

Falch, T. and J.A.V. Fischer (2012), "Public sector decentralization and school performance: International evidence", Economic Letters 114, pp. 276-279.

Fischel, W. (2001), The Homevoter Hypothesis, Harvard University Press, Cambridge, MA.

Galiani, S., P. Gertler and E. Schargrodsky (2008), "School decentralization: Helping the good get better, but leaving the rest behind", Journal of Public Economics 92, pp. 2106-2120.

Hanushek, E.A. (1986), "The economics of schooling: Production and efficiency in public schools", Journal of Economic Literature 24, pp. 1141-1177.

Houlberg, K., et al. (2016), OECD review of policies to improve the effectiveness of resource use in schools: Country background report for Denmark, Det Nationale Institut for Kommuners og Regioners Analyse og Forskning (KORA), Copenhagen.

Hoxby, C.M. (2001), "All school finance equalizations are not created equal", Quarterly Journal of Economics 116, pp. 1189-1231.

Husted, T.A. and L.W. Kenny (2000), "Evidence on the impact of state government on primary and secondary education and the equity-efficiency trade-off", Journal of Law and Economics 43, pp. 285-308.

Iceland Ministry of Education, Science and Culture (2014), OECD review of policies to improve the effectiveness of resource use in schools: Country background report for Iceland, Iceland Ministry of Education, Science and Culture, Reykjavík.

Jackson, C.K., R.C. Johnson and C. Persico (2016), "The effects of school spending on educational and economic outcomes: Evidence from school finance reforms", Quarterly Journal of Economics 131, pp. 157-218.

Lotz J., J. Blom-Hansen and S. Hartmann Hede (2015), "The changing role of local income taxation in Denmark", in Interaction between local expenditure responsibilities and local tax policy: Copenhagen Workshop 2013, Korea Institute of Public Finance and Danish Ministry for Economic Affairs and the Interior, Copenhagen, pp. 231-252.

Lundqvist, H. (2015), "Granting public or private consumption? Effects of grants on local public spending and income taxes", International Tax and Public Finance 22, pp. 41-72.

Oates, W.E. (2005), "Toward a second-generation theory of fiscal federalism", International Tax and Public Finance 12, pp. 349-373.

OECD (2017), OECD Fiscal Decentralisation Database, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

OECD (2015), Education at a Glance 2015: OECD Indicators, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2015-en.

OECD (2014), PISA 2012 Results: What Students Know and Can Do (Volume I, Revised edition, February 2014): Student Performance in Mathematics, Reading and Science, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264208780-en.

OECD (2013), PISA 2012 Results: Excellence through equity. Giving every student the chance to succeed (Volume II), OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264201132-en.

OECD (2012a), Equity and quality in education: Supporting disadvantaged students and schools, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264130852-en.

OECD (2012b), Education at a Glance 2012: OECD indicators, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2012-en.

Nusche, D. et al. (2011), OECD reviews of evaluation and assessment in education: Norway 2011, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264117006-en.

OECD (2010), PISA 2009 results: What makes a school successful? Resources, policies and practices (Volume IV), OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264091559-en.

OECD (2008), Education at a glance 2008: OECD indicators, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2008-en.

OECD (2005), Education at a glance 2005: OECD indicators, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2005-en.

Rattsø, J. (ed.) (1998), Fiscal federalism and state-local finance: The Scandinavian perspective, Edward Elgar, Cheltenham.

Rodden, J. (2003), "Reviving Leviathan: Fiscal federalism and the growth of government", International Organization 57, pp. 695-729.

Salinas, P. (2014), "The effect of decentralization on educational outcomes: Real autonomy matters!", Documents de Treball de l'IEB 2014/25, Barcelona.

Tiebout, C.M. (1956), "A pure theory of local expenditures", Journal of Political Economy 64, pp. 416-424.

Woessmann, L. (2005), "The effect heterogeneity of central exams: Evidence from TIMSS, TIMSS-repeat and PISA", Education Economics 13, pp. 143-169.

Further reading

Slack, E. and R.M. Bird (2014), "The political economy of property tax reform", OECD Working Papers on Fiscal Federalism, No. 18, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jz5pzvzv6r7-en.

Annex 5.A1

Overview of country-level data used in the analysis

Table 5.A1.1. **Local funding of education**

Country	Local education funds after transfers as percentage of total education funds	Local education funds before transfers as percentage of total education funds	Local tax revenue as percentage of total local revenue	Tax revenue with local rate discretion as percentage of total local tax revenue	Decisions taken at local level as percentage of key education decisions
Australia				100.0	0.0
Austria	11.8	10.8	66.0	23.0	14.1
Belgium	4.1	4.1	31.4	99.7	0.0
Canada	85.6	21.0	39.2	97.9	49.3
Chile	42.8	5.1		41.6	41.3
Czech Republic	25.3	25.3	47.3	100.0	28.4
Denmark	87.6	94.2	33.8	98.1	33.6
Estonia	73.1	35.3	43.6	10.3	20.2
Finland	89.4	58.7	45.4	91.3	100.0
France	12.9	12.7	48.0	62.9	0.0
Germany	21.8	17.5	39.4	58.4	20.8
Greece			6.8	75.8	4.9
Hungary	70.0	35.6	25.1	84.2	23.5
Iceland	73.3	72.6	73.0	99.3	35.7
Ireland	16.3	0.9	18.4		0.0
Israel	28.4	10.4	41.7[a]	100.0	13.2
Italy	11.6	9.7	45.4	93.7	4.2
Japan	16.8	16.8		0.0[b]	35.4
Korea	68.9	3.4	32.6[a]	0.0[b]	4.3
Latvia	79.2	35.8			
Luxembourg	16.2	10.9	28.2	97.2	0.0
Mexico	0.0	0.0	11.5[a]	100.0	0.0
Netherlands	11.1	8.9	9.4	97.3	0.0
New Zealand	0.0	0.0		99.2	
Norway	91.8	90.7	37.8	0.0[b]	64.8
Poland	94.3	93.3	31.7	36.5	26.5
Portugal	9.2	3.6	33.3	72.9	0.0
Slovak Republic	77.0	18.5	45.8	99.7	7.3
Slovenia	10.0	9.6	42.5	14.1	10.2
Spain	5.9	5.9	51.7	81.2	0.0
Sweden			60.9	97.4	35.3
Switzerland	38.8	34.9	57.8[a]	100.0	12.2
Turkey				0.0	0.0
United Kingdom	65.5	65.5	13.3	100.0	28.1
United States	97.9	50.4			52.8

Note: [a] indicates that data refer to a year earlier than 2012; [b] indicates that tax autonomy is set to zero because local governments all set the same rates in practice.

Source: OECD (2012b), *Education at a Glance 2012: OECD Indicators,* http://dx.doi.org/10.1787/eag-2012-en; OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en; OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Table 5.A1.2. **Funding at the intermediate level in federal countries**

Country	Education funds from intermediate level after transfers as percentage of total education funds	Education funds from intermediate level before transfers as percentage of total education funds	Tax revenue as percentage of total revenue at intermediate level	Tax revenue with rate discretion as percentage of total tax revenue at intermediate level	Decisions taken at intermediate level as percentage of key education decisions
Australia	96.1	68.3		100.0	50.8
Austria	48.6	12.6	46.5	38.8	22.2
Belgium	72.0	73.2	15.5	99.5	28.7
Canada	11.5	75.4	54.3	88.9	31.2
Germany	71.4	75.1	66.7	3.1	36.0
Italy	6.7	8.1		47.1	19.2
Mexico	71.5	21.9	5.6	100.0	42.8
Spain	79.8	79.4	65.2	60.1	82.9
Switzerland	61.0	61.5	51.8	100.0	62.5
United States	1.7	38.5	50.7	100.0	25.0

Source: OECD (2012b), *Education at a Glance 2012: OECD Indicators,* http://dx.doi.org/10.1787/eag-2012-en; OECD (2015), *Education at a Glance 2015: OECD Indicators,* http://dx.doi.org/10.1787/eag-2015-en; OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Table 5.A1.3. **Inequality measures and control variables**

Country	Total variance in scores as a percentage of OECD average variance	Percentage of variation in scores explained by socio-economic background	Percentage variation in scores explained by school mean socio-economic profile	Range of socio-economic background between 5th and 95th percentiles	Average spending per student from the age of 6 to 15 (USD, PPPs)
Australia	109.3	12.3	55.5	2.48	98 025
Austria	100.9	15.8	56.3	2.72	116 603
Belgium	123.3	19.6	70.1	2.75	97 126
Canada	93.1	9.4	41.8	2.71	80 397
Chile	76.9	23.1	75.4	3.66	32 250
Czech Republic	106.3	16.2	70.5	2.37	54 519
Denmark	79.5	16.5	70.9	2.57	109 746
Estonia	77.2	8.6	58.0	2.48	55 520
Finland	85.8	9.4	38.3	2.39	86 233
France		22.5		2.54	83 582
Germany	109.4	16.9	71.3	2.91	80 796
Greece	90.9	15.5	65.1	3.12	
Hungary	103.4	23.1	78.4	3.02	46 598
Iceland	99.7	7.7	68.8	2.55	93 986
Ireland	84.4	14.6	79.3	2.65	93 117
Israel	129.8	17.2	66.5	2.56	57 013
Italy	101.5	10.1	48.4	3.13	84 416
Japan	103.2	9.8	65.9	2.22	89 724
Korea	115.8	10.1	57.3	2.38	69 037
Latvia	79.1	14.7	62.2	2.77	45 342
Luxembourg	107.3	18.3	93.3	3.48	197 598
Mexico	65.0	10.4	46.1	4.1	23 913
Netherlands	99.0	11.5	57.8	2.41	95 072
New Zealand	117.0	18.4	78.4	2.58	70 650
Norway	96.6	7.4	46.4	2.36	123 591
Poland	96.3	16.6	56.8	2.74	57 644
Portugal	104.1	19.6	62.1	3.74	70 370
Slovak Republic	119.9	24.6	73.8	2.89	53 160
Slovenia	99.1	15.6	77.7	2.69	91 785
Spain	90.8	15.8	54.7	3.26	82 178
Sweden	99.3	10.6	55.5	2.47	95 831
Switzerland	104.8	12.8	44.0	2.85	127 322
Turkey	97.8	14.5	57.6	3.64	19 821
United Kingdom	105.4	12.5	63.6	2.53	98 023
United States	95.2	14.8	57.8	3.12	115 961

Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en.

Chapter 6

Fiscal decentralisation and inclusive growth: Considering education

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This chapter focuses on whether fiscal decentralisation can help to promote the sustainability of education funding. The linkage between fiscal decentralisation and education expenditure and performance is examined using data from OECD countries. The results clearly show the positive effect of fiscal decentralisation on education expenditure. In addition, the results reveal how regional disparities in the distribution of the total national budget, affects education expenditure. The findings suggest that fiscal decentralisation and balanced regional development may increase the solidity of education expenditure. Regional disparities reduce the efficient allocation of the national budgets and may cause declining education expenditure. This empirical study confirms that OECD countries tend to spend more money on education in order to provide educational opportunitites for lower income populations, when income inequality worsens. The chapter explores not only the typical "mean-scored" students, but also higher and lower-scored students, according to PISA. According to the estimates, lower-scoring student populations seem to be more responsive to public investment. This provides a good indicator with regard to whether or not education policy should concentrate on low-scoring student populations or low-income households. This chapter also finds that income inequality is a fundamental factor that affects education expenditure and education performance.

Introduction

This chapter attempts to show that fiscal decentralisation of education financing may lead to inclusive growth via the accumulation of human capital and balanced regional development. The rationale for focusing on fiscal decentralisation within the framework of inclusive growth is rooted in the importance of early childhood education. As the US *2016 Economic Report of the President* said:

> *Public investment that improves the inputs in a child's early years can help to close critical achievement, health, and development gaps, and can lead to benefits such as higher earnings that accumulate over a lifetime. Closing these gaps is not just about education, but also about more broadly alleviating the budget constraints facing families of younger children.* (Council of Economic Advisors, 2016: p.154)

Korea has a centralised education financing system. From an expenditure perspective, Korea is one of the world's leading countries in education, from early childhood up to upper-secondary education. This fact has been considered as a critical contributor to its high education performance and human capital for economic growth. However, strong centralisation of education financing does not seem to be sustainable anymore. This is on account of two significant changes to Korea's economic and policy environments. The first is a practical and macroeconomic challenge, vulnerable to the fiscal environment due to low economic growth. The second is an academic and systematic challenge, which might be the fiscal leakage through transfer-oriented financing structures in education. The strong fiscal dependency of education financing on the central government has exacerbated fiscal sustainability, since the fiscal responsibility for education financing is not linked to the beneficiaries of regional education services. The education financing system in Korea now encounters a new paradigm for inclusive growth. The new paradigm might be the reform of fiscal decentralisation of the education financing system.

There are many previous studies regarding the decentralisation of education financing. Education decentralisation reforms are generally in line with the characteristics of local funding. In short, the greater the voice of community participation there is the greater local or school autonomy, and the greater competition among schools. Some of those reforms reflect reallocations of resources and a change in school agents' behaviour. Meanwhile, one of the fundamental reforms in Korea is the merger of local public finance and education finance. This merger is not introduced but argued so many years. Unlike other OECD countries, local governments are not the providers of primary, lower and upper-secondary education services in Korea. The Korean Ministry of Education administers and sets the overall education policy, including the distribution of education expenditure. The Provincial Office of Education is the acting manager by relevant laws and orders.

Analyses commonly suggest that the merging of local public finance and education finance and the decentralisation of education finance have become global trends. However, education experts have strongly objected to the merging. They believe that local governments are not likely to assign high priority to education in comparison with social welfare and social overhead capital. The opposing group against the merging of the two governances has two primary concerns, although their concerns have not been clearly established. First is a reduction of education investment following decentralisation. The second is a decline in education performance, not only through the shrinkage of the size of the education budget, but also through a lack of

education administration and management capabilities found in local governments. Barankay and Lockwood (2006) supported the negative argument of decentralisation. Their main criticism of decentralisation is that the competence of local politicians standing for election may be lower than those standing for positions in the central government. Local politicians' negotiating power on their budget may be inferior to that of the central government. This supposed tendency may reduce the sectoral budget, including education expenditure.

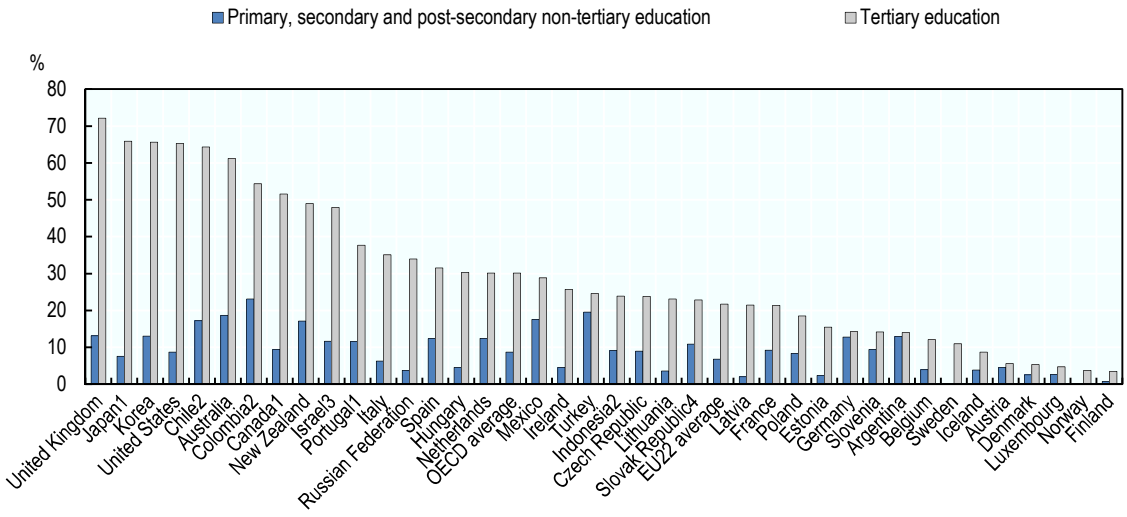
In order to elaborate the arguments for the merger of two separate institutions – local governments and regional education agencies – empirical evidence should inform the discussion.

In spite of the concerns of some educators, most previous studies show that fiscal decentralisation may positively affect education performance measured by the OECD Programme for International Student Assessment (PISA). According to theory and empirical evidence, fiscal decentralisation may lead to giving education expenditure a high priority. Higher investment in education is likely to provide stability for education administration and management. Then, this stability would contribute to high education performance. Even though all the aspects of the accumulation of human capital are important, the most critical part of public education is the public provision of primary, lower and upper-secondary education. Education is tightly inter-correlated with inclusive growth. The accumulated human capital drives economic growth. Fiscal decentralisation underpins this virtuous cycle.

This chapter aims to investigate whether fiscal decentralisation might be strongly and positively correlated with education expenditure, and reasonably associated with education performance as well. The chapter considers countries' gross domestic product (GDP) level, income inequality and regional disparities as well as several education performance variables. The analysis presumes the effect of income inequality on regional disparities. The difference between this chapter and the previous literature is the estimation of marginal effects of regional disparities on education performance. A decomposition of PISA performance groups will be investigated. In order to maximise the efficacy of the policies, the target group of education and fiscal policy should be treated in the estimation separately.

Ultimately, this chapter discusses the idea of the merger between local public finance and education authority analytically. We aim to provide the concreteness of economic intuition through the estimating of the fiscal decentralisation effect on education expenditure/performance. Figure 6.1 shows the share of private expenditure on educational institutions in 2014.

Figure 6.1. **Share of private expenditure on educational institutions, 2014**



Notes:
1. Some levels of education are included with others. Refer to "x" code in Table B1.1 for details.
2. Year of reference 2015
3. Private expenditure on government-dependent private institutions is included under public institutions.
4. Expenditure on public institutions for bachelor's, master's and doctoral degrees.

Source: OECD (2017d), *Education at a Glance: OECD Indicators*, http://dx.doi.org/10.1787/eag-2017-en

Education financing in Korea: The challenges

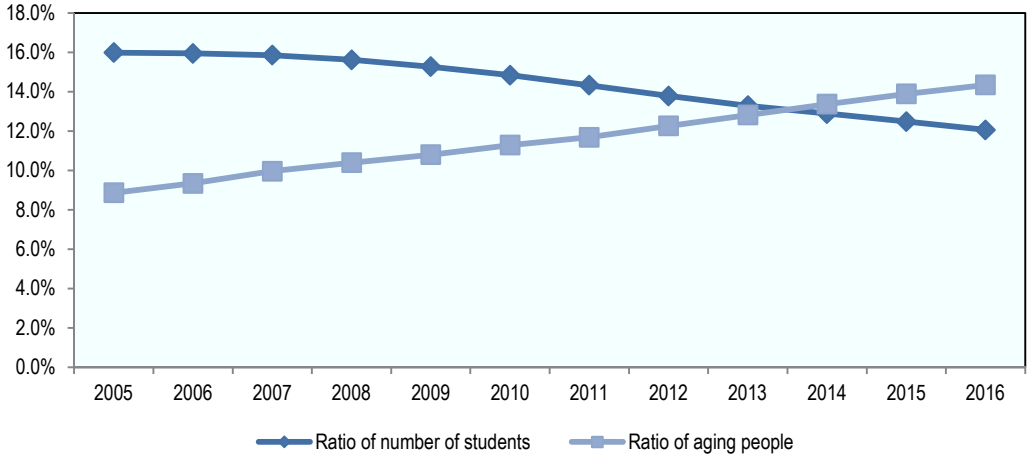
Korea's high performance in the Programme for International Student Assessment (PISA) has been a source of pride for the country. However, this pride created unexpected issues for the education system. The issues were highlighted in the OECD Country Note for Korea (OECD, 2014b) as part of the publication *Education at a Glance*: *OECD Indicators*. It pointed out that the share of private expenditure in Korea is much higher than the OECD average and the highest at the tertiary level. The reduction of private expenditure in education has been heavily discussed as a critical social and political issue in every president's administration. However, the situation has not improved over the last few decades. Since almost all Korean households bear a heavy private education burden and the new administration sees income-driven growth as one of the national growth strategies, education policy makers are making a variety of efforts to reduce the private education burden. They are trying to protect a certain level of disposable income by reducing the private education expenditures of households from 2017.

However, the issue of fiscal sustainability for primary, lower and upper-secondary schools has not been examined analytically, because of political reasons. Unlike other OECD countries, in Korea, the central government – the Ministry of Education – is responsible for financing education. Education experts and associated institutions are firmly against a shift from the current centralisation to the decentralisation of education financing. In order to set up a stable funding plan, fiscal decentralisation on education financing should be redesigned, as in other OECD countries. According to OECD (2016a), expenditure of sub-national governments on education, as a share of total public spending on education, represented only 51% of OECD's unweighted average in 2013. In most countries, sub-national governments are responsible for the construction

and maintenance of education infrastructures and the financing of school-related activities, commonly for primary school and frequently for secondary school. In contrast to other OECD countries, currently, sub-national governments in Korea partially co-sponsor education financing.

Education decentralisation would strengthen the sustainability of education funding. In the context of current policy reforms, the merger of local public finance and education authority finance would be one of the solutions. The rationale for the consolidation is mainly the imbalance of population composition between the increasing number of ageing people and the decreasing number of students in education (Figure 6.2). This imbalance inevitably produces a mismatch of fiscal demands between generations. The fiscal demands of local governments have been expanding rapidly due to Korea's ageing population. In contrast, the number of students has been steadily decreasing due to the decrease in birth rates. Currently, the amount of 19.24% and 20.27% of national tax is transferred to local governments (Ministry of Interior and Safety) and education districts (Ministry of Education) by law regardless of economic and financial demand. As a result, the allocation of intergovernmental transfers has exacerbated this mismatching problem. In order to alleviate this mismatch, the merger of local government and education authority was suggested during the last few decades as a change of population composition had been expected, but it is not institutionalised yet.

Figure 6.2. **Increase of ageing population and decrease of student population in Korea, 2005-16**



Source: KOSIS, *Statistical Year Book* (Yearly), Ministry of Interior and Home affairs.

However, the Ministry of Education and its experts have not participated in this national fiscal agenda. The opponents worried about the decrease in the size of education funding. They also believe that education quality and student achievement are inevitably intertwined. The voting power of the education sector is quite potent in political elections. Then, this merger issue has not been placed on the debating table although the solution is quite clear. When taking into account that the financial resources are utterly insufficient to cover all the fiscal needs, which are dramatically increasing due to the explosive welfare budget, policy directions and priorities for resource allocation should be re-designed for sustainable fiscal development.

Therefore, this chapter aims to identify how this merger is effective analytically. The analyses based on the other countries' cases attempt to examine whether local governments tend to pay little attention to education expenditure and education performance or not.

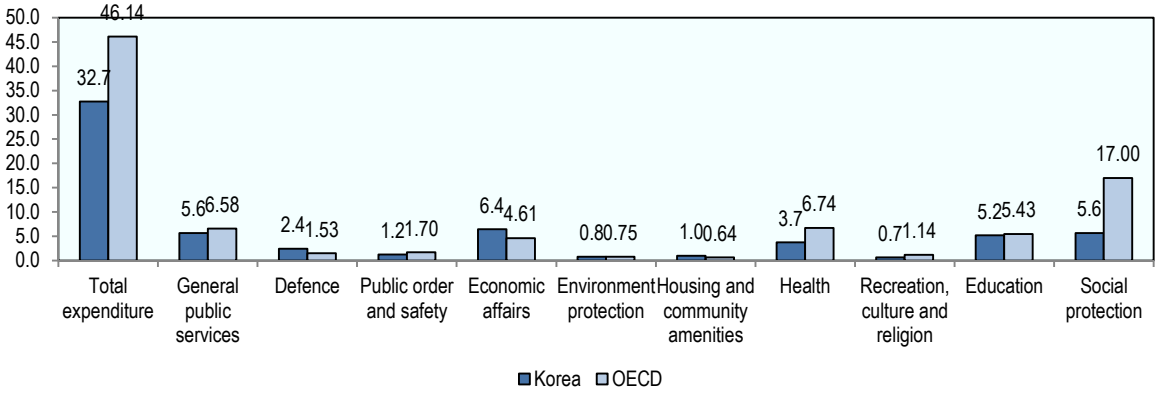
Fiscal decentralisation and education in Korea

Despite a small government, Korea places a high priority on education

Korea's total expenditure share of general government expenditure is approximately only one-third of its GDP, which means that it has a small government compared with the OECD average. The average government size of the other countries is approximately 46% of GDP (Figure 6.3). But Korean education expenditure is relatively high compared with other welfare-related expenditure and has been the most rapidly expanding spending item.

Figure 6.3. **Expenditure share of general government expenditure by function**

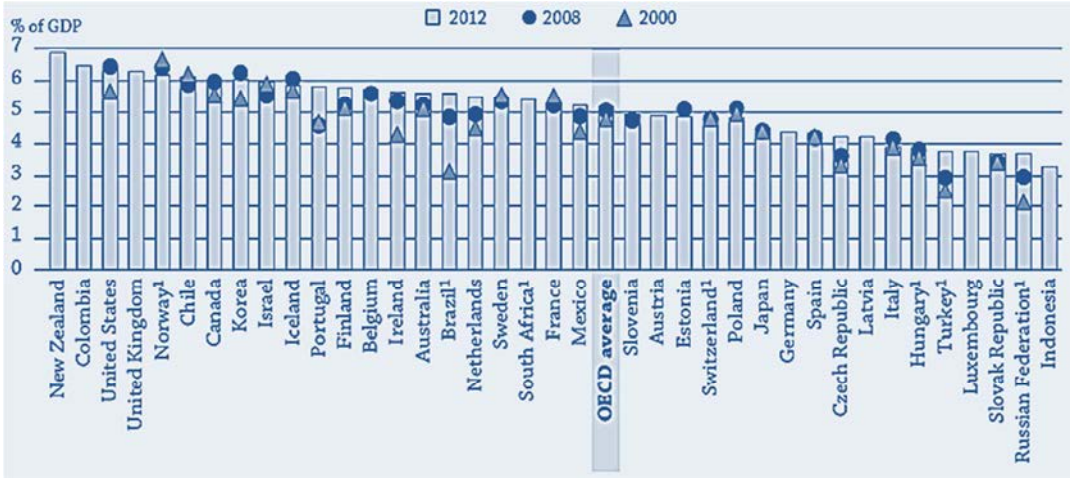
2015, per cent of GDP



Source: OECD (2015), *National Accounts at a Glance 2015*, http://dx.doi.org/10.1787/na_glance-2015-en.

Korea belongs to a top-tier country group that spends a significant amount on education. The average ratio of public education expenditure to GDP in OECD member countries and partner economies ranges between 3-7% of GDP. Figure 6.4 shows that Korea's ratio of public education expenditure to GDP is higher than the OECD average of about 5% of GDP.

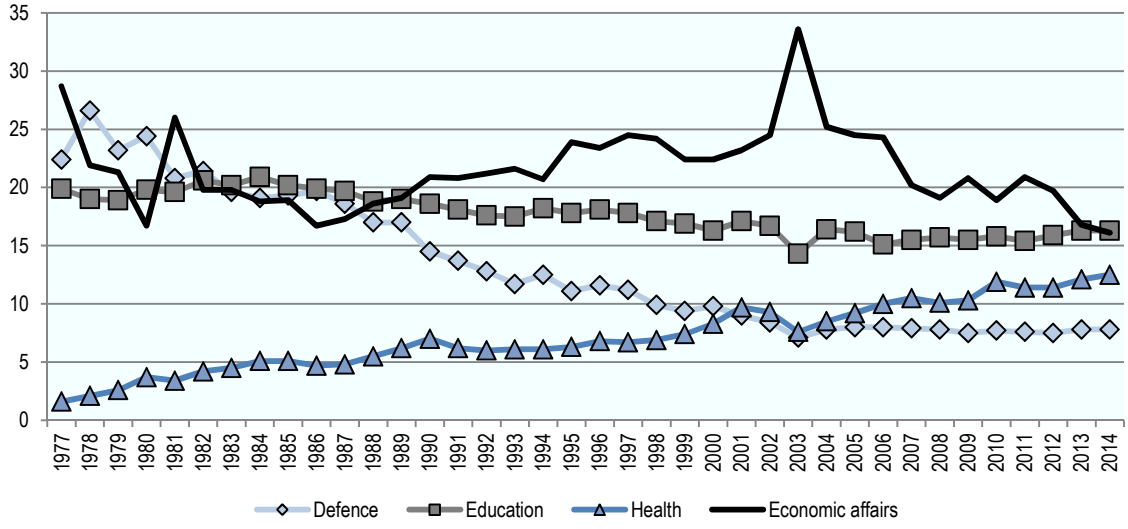
Figure 6.4. **Ratio of public education expenditure to GDP in selected countries, 2000-12**



Source: OECD (2015d), *Education at a Glance 2015*, http://dx.doi.org/10.1787/eag-2015-en

Education has been high on the national agenda and a top priority for Korea's national growth strategy. Historically, education expenditures have been very stable, at around 16-20% of total government expenditure, with limited variation due to strong government support for national growth. This stability indicates Korea's strong commitment to education. Most of the remaining government functions show a different trend, which is inconsistent and volatile due to the change of social needs and of policy priorities, along with economic and social development. For example, the ratio of defence and economic affairs to total government expenditure has been decreasing, while the share of health has been increasing rapidly (Figure 6.5).

Figure 6.5. **Ratio of expenditure items to total government expenditure in Korea**



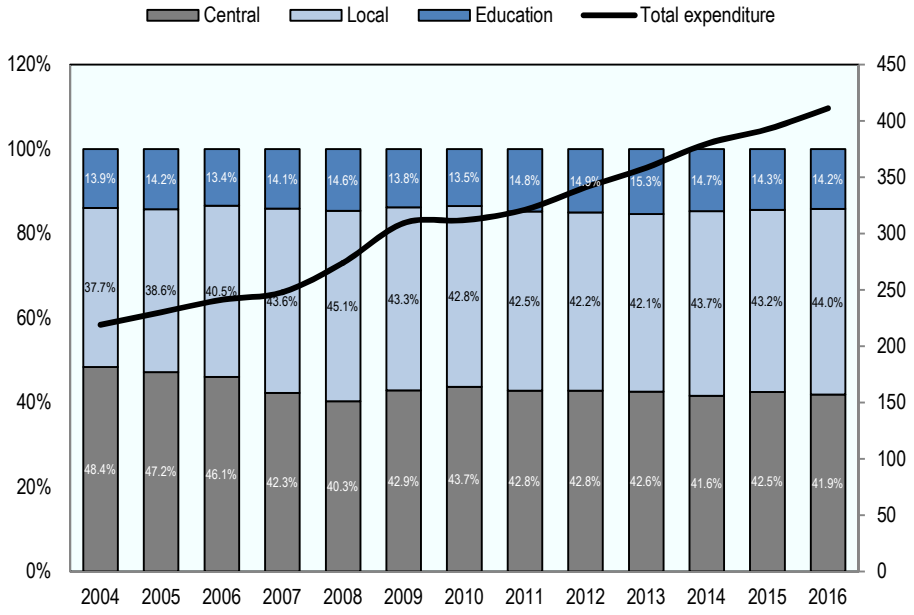
Source: OECD(2015a), *National account at a Glance 2015*, http://dx.doi.org/10.1787/data-00019-en

A decentralised country with separate education accounts

Korea operates a separate education account. As Figure 6.6 shows, the central government controls only 40% of the overall budget. The remaining 60% of the total budget is controlled by local governments and the education authority. This is in contrast to the situation in other OECD countries, implying that Korea is one of the most decentralised OECD countries. Furthermore, the share of local government and the education authority has been consistently increasing. On the other hand, the central government share is decreasing.

Figure 6.6. **The budget size and expenditure shares of general government in Korea**

By unit, in %, KRW trillion



Source: KOSIS, *Statistical Year Book* (Yearly), Ministry of Interior and Home affairs.

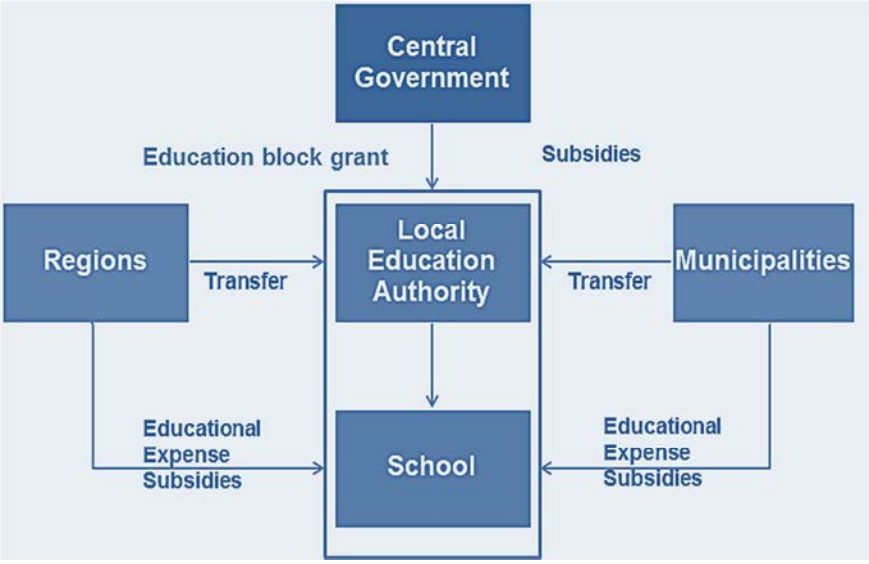
Meanwhile, securing sub-national fiscal capacity is essential for sustainable and stable education funding. A comparison of fiscal transfers from the central government to local governments among OECD countries shows that the sub-national fiscal capacity of Korea is weaker than in other OECD peer countries. Low taxing power of local governments leads to a high dependence on transfers from central government. Lower accountability of sub-national government potentially jeopardises the sustainability of education expenditure in Korea. Moreover, regional disparities weaken the sub-national tax base and lead to increase in transfers for lagging regions.

The funding structure of Korea's education financing

Education is a sector in which funding is disbursed by multi-level governments. How are funds transferred to the sector by central government in Korea? Figure 6.7 shows Korea's national education funding structure. First of all, the Ministry of Strategy Finance (MOSF) transfers two kinds of grants to the Ministry of Education, such as the Education Block Grant (EBG) and subsidy. Overall, EBG has two purposes: one is to support about 60% of teacher salaries, and the other is to equalise

school management costs of education agencies. The equalisation of education services is implemented by central government transfers to local education districts as a means to decrease the divergence among social classes and promote the minimum level of education in specific disadvantaged districts.

Figure 6.7. **Korea's national education funding structure**



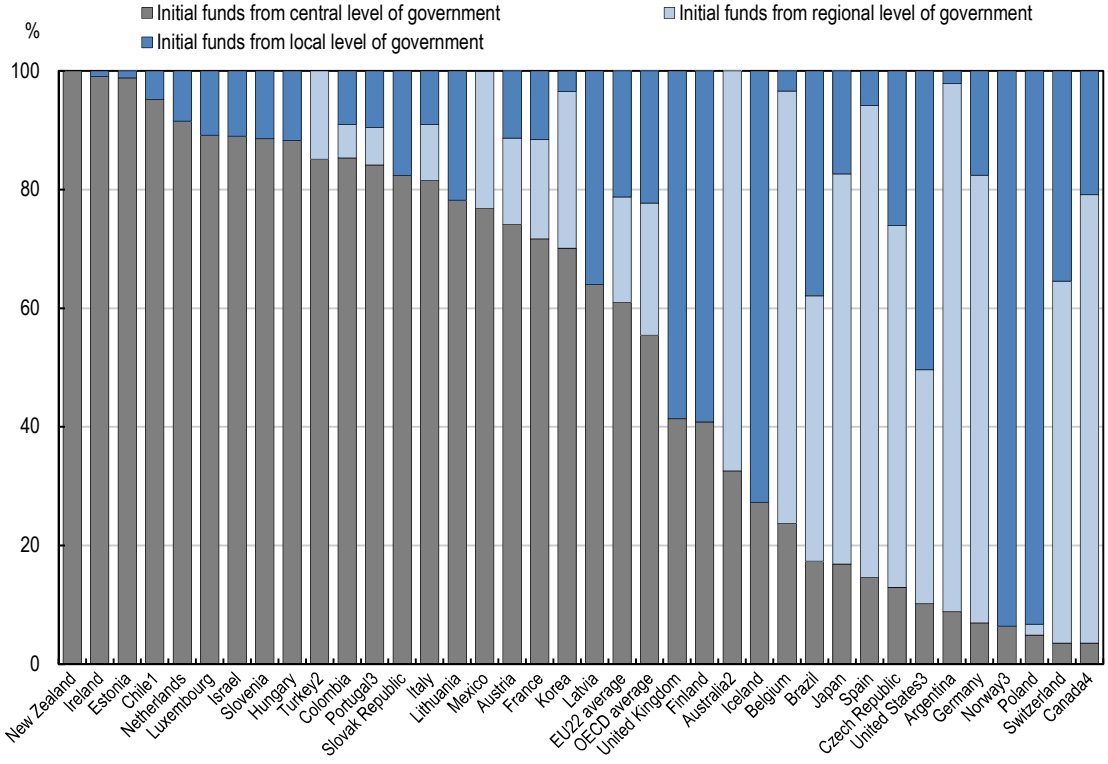
Source: Author's preparation

EBG is mandatory spending, which means all the transferred money should be executed within the scheduled time period. The Local Education Grant Act (LEGA) specifies a "statutory grant rate (20.27% of National Internal Tax)" and regulates transfer mechanisms in detail. LEGA also explicitly defines the mandatory obligations and responsibilities of regional and local government to local education districts. Therefore, sub-national governments are able to exercise very limited autonomy regarding the use and management of transferred funds. Limited autonomy of sub-national governments creates lower sub-national accountability.

In addition, local governments, provinces and municipalities also have to transfer some educational subsidies to their local authority as local education tax money, which is a surtax on local taxes. The funding obligation of sub-national government is specified by law, so this mechanism restricts their autonomy further. In summary, even though a significant portion of education expenditure appears to be controlled by the local governments or education authorities, their real autonomy in using and managing the money is very limited due to strict regulation.

High funding centralisation of above 70% has been consistently maintained. The rest of the funds are sourced from the regional and local government with a half-and-half ratio. In terms of transfer ratio from central government to local government, Korea ranks high among OECD countries, as seen in Figure 6.8. In the figure, the dark blue bar represents the proportion of funds transferred from central government to local government.

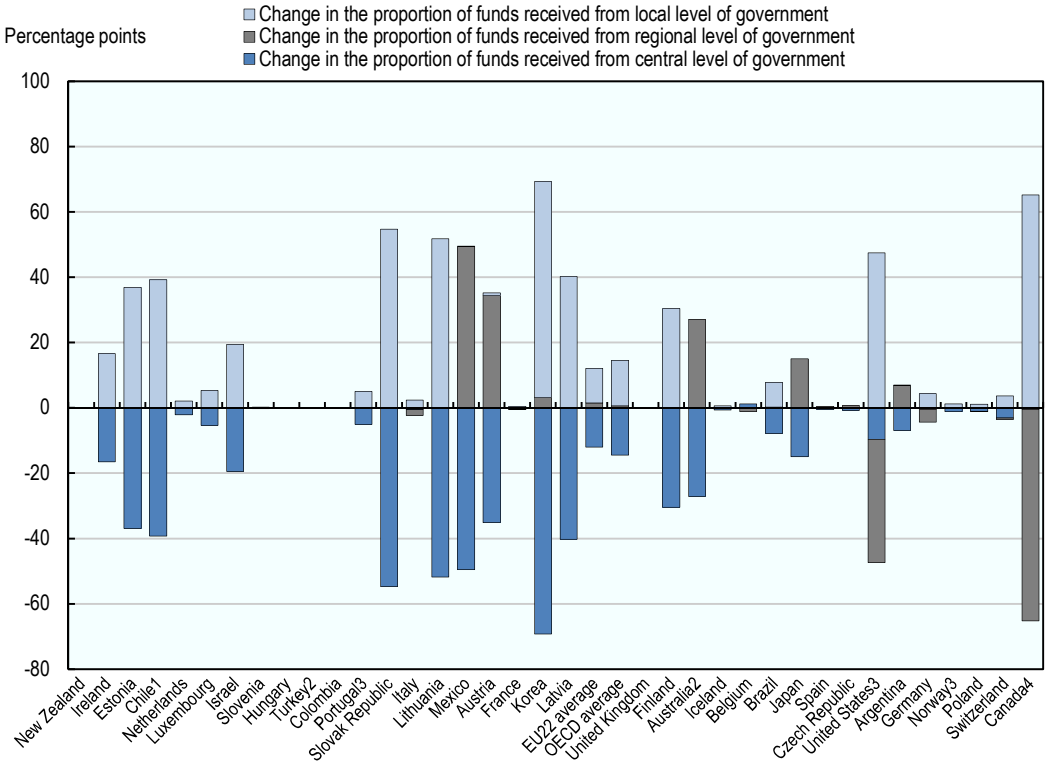
Figure 6.8. **Distribution of initial sources of public funds for education by level of government in primary, secondary and post-secondary non-tertiary education, 2013**



Source: OECD (2016b), *Education at a Glance 2016: OECD Indicators*, http://dx.doi.org/10.1787/eag-2016-en

As seen above, Korea has a unique educational governance system compared with other OECD countries. Lower fiscal decentralisation reduces the fiscal efficiency of public services, including education. Devolving more responsibilities from central government to local governments would probably contribute to improving the sustainability of spending in the future. Figure 6.9 shows that Korea has the largest transfers from central government to the local level of government. Figure 6.9 depicts the change in the proportion of funds received from levels of government between initial and final purchasers of educational resources.

Figure 6.9. **Change in the proportion of funds received from levels of government between initial and final purchasers of educational resources**



Note: Countries are ranked in descending order of the share of initial source of funds from the central level of government.

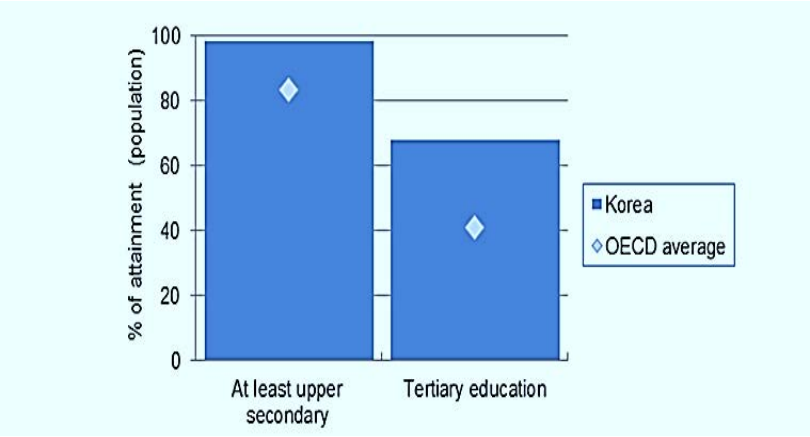
Source: OECD (2016b), *Education at a Glance 2016: OECD Indicators*, Figure B4.3, http://dx.doi.org/10.1787/eag-2016-en.

Education performance and challenges

Education investment and education performance

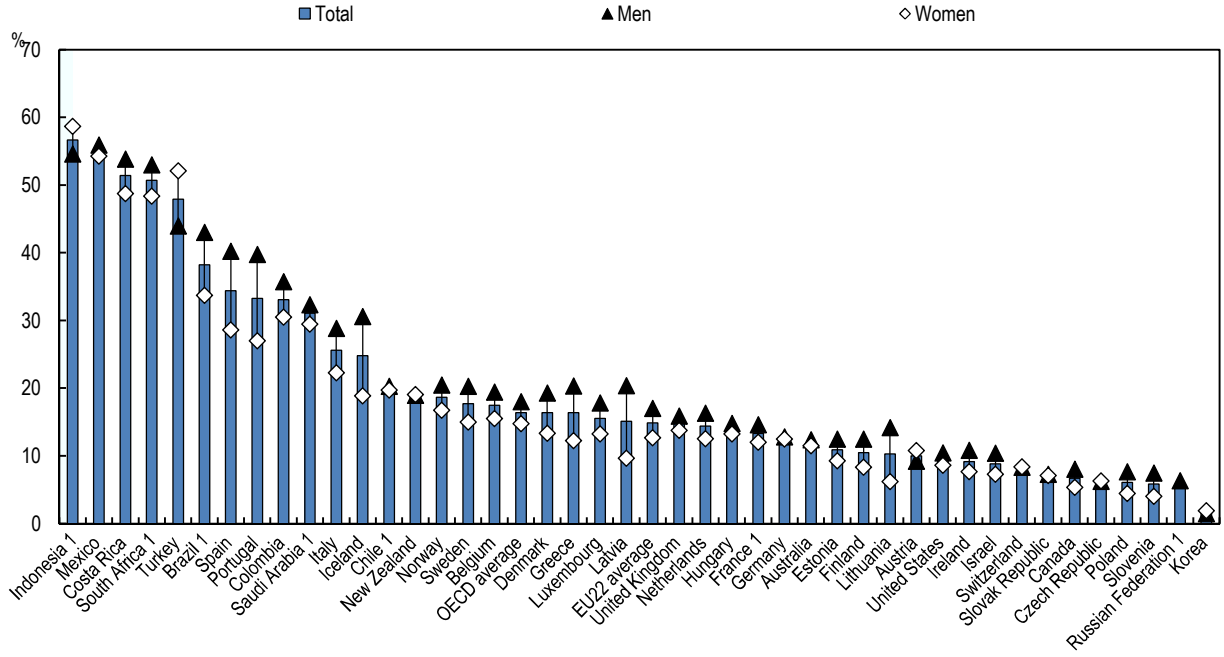
The rapid expansion of education in Korea is exceptional and has played a vital role in its economic development. Korea also saw a significant increase in expenditure per student from 2008 to 2013, for all education levels, driven by increased public expenditure. In Korea, the share of 25-34 year-olds in 2015 with at least an upper-secondary education was 98% of the total population, which is significantly higher than the OECD average of 84% (Figure 6.10). The percentage of 25-34 year-olds with a tertiary education is 69% in Korea, compared to the OECD average of 42% (Figure 6.10). The difference between the Korean and OECD educational attainment averages increases with the level of higher education. As shown in Figure 6.11, Korea has the lowest percentage of 25 to 34-year-old adults with below upper secondary education. Based on the high education performance, Korea has maintained its position among the OECD's top performers in mathematics, reading and science in PISA for many years.

Figure 6.10. **Korea's upper-secondary and tertiary attainment for 25-34 year-olds, 2015**



Source: OECD (2016b), *Education at a Glance 2016: OECD Indicators*, http://dx.doi.org/10.1787/eag-2016-en.

Figure 6.11. **Percentage of 25 to 34-year-old adults with below upper secondary education, 2015**



Note: 1. Reference year differs from 2015. Refer to the source table (A1.3) in OECD (2016b) for more details.

Countries are ranked in descending order of the percentage of 25-34 year-olds with attainment below upper secondary education.

Source: OECD (2016b), *Education at a Glance 2016: OECD Indicators*, http://dx.doi.org/10.1787/eag-2016-en.

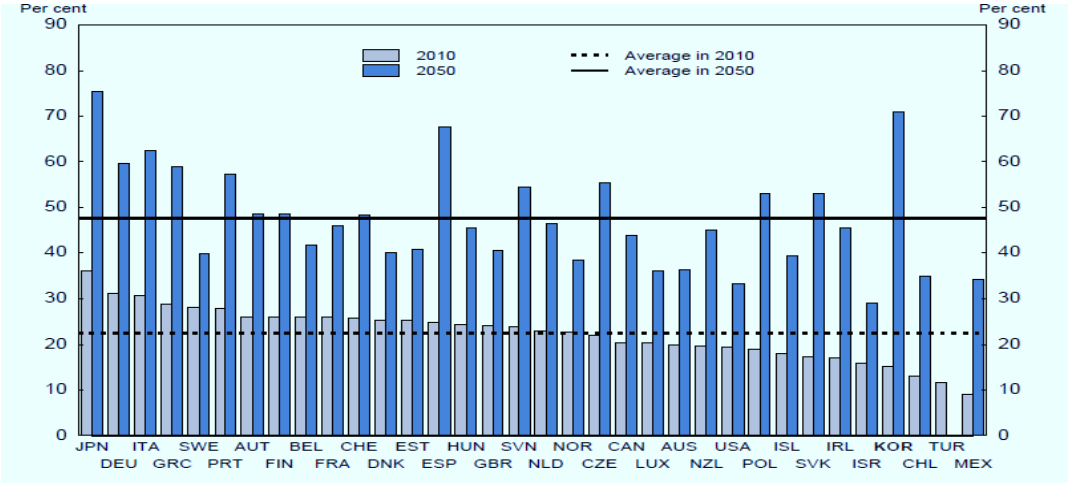
The World Economic Forum (Samans et al., 2015) reports that education equity in Korea is particularly high compared to other countries. Korea has the highest attainment rates among OECD countries in upper-secondary and tertiary education for 25-34 year-olds. From the perspective of accessibility, Korea has accomplished an outstanding achievement with regard to education opportunity and performance within

only one generation. Compulsory education covers primary and lower secondary levels, from age 6 to age 14. Tracking starts at age 14, the same as the OECD average, and grade retention is very rare.

Korea has a number of policies in place to promote equity in education, most notably for the very young. Coverage of early childhood education and care is very high. Enrolment rates in early childhood and pre-primary education are the highest in the OECD, with 89% of 2-year-olds and 90% of 3-year-olds enrolled in 2014 (significantly higher than the OECD average of 36% for 2-year-olds and 71% for 3-year-olds). The proportion of 15-year-olds who had attended more than one year of pre-school in PISA 2012 was 82.9%, which is also much higher than the OECD average of 74.0%. The Nuri Curriculum, an integrated curriculum in early childhood education and nursery, financially supports the cost of pre-school education for all 3-5 year-olds, regardless of their parents' incomes. Nuri means "One World" in Korean, representing togetherness and sharing.

One of the hottest issues in the Korean education system is an increasing call for the restructuring of tertiary education due to the change in population composition. Korea's population is ageing faster than in any other OECD country and has the lowest fertility rate of 1.17 (Figure 6.12). In order to maintain or enhance its national growth potential, in spite of rapid demographic ageing, Korea needs to reorganise and redesign its education system. Korea needs to change the overemphasis on tertiary education, in part by improving vocational education, to reduce the mismatch problem that limits youth labour market participation.

Figure 6.12. **Ageing trends in OECD countries: A forecast**



Note: The elderly dependency ratio shown in this figure is defined as the over-65 population as a share of the 20-to-64 population.

Source: Statistics Korea (2011), *Population Projection for Korea*; OECD (n.d.), *Demography and Population Database*, http://stats.oecd.org/Index.aspx?DatasetCode=POP_FIVE_HIST.

Inclusive growth and the increase in tertiary education investment

Sustaining Korea's growth potential in the face of demographic changes requires further improving the education system to enhance productivity growth. Currently, over 83% of total education expenditure is going to primary, lower and upper-

secondary education. So, only a small portion of total education expenditure is spent on tertiary education. In order to strengthen inclusiveness, education expenditure should be distributed equally between primary, lower and upper-secondary and tertiary level education.

Less investment in tertiary education may negatively affect employment rates and contribute to poverty traps. Korea needs to alleviate the over-dependence on primary, lower and upper-secondary education levels. Over 80 % of total education budget has been focusing on primary, lower and upper-secondary education levels. Therefore, policy should address the emphasis on tertiary education. A higher share of education expenditure should be distributed to tertiary education in order to restructure education financing from now on.

Literature review

Morrone et al. (2011), stress that human capital is essential to maintain a household's resilience against negative shocks. The OECD launched the Inclusive Growth Initiative in 2012 to help countries analyse and address rising inequalities. The OECD is continuing its methodological work in order to refine the multidimensional living standards measure, incorporating other non-income dimensions related to well-being, such as health inequality and education (OECD, 2015b).

The World Bank (2014) also emphasises the importance of education for inclusiveness. The research points out that improving the human capital of impoverished populations is fundamental to ultimately ensure that they can access jobs and earn a livelihood. More and better-paying jobs will be the primary solution to reduce poverty and income inequality. In order to do so, education policy should be more focused on lower-income populations.

The previous US administration (Council of the Economic Advisors, 2016) also focused on early childhood disparities and opportunity gaps. The researchers studied a broad set of policies that provide investment in early childhood and found significant and wide-ranging benefits of such policies for parents and children. Public investment that improves the inputs in a child's early years can help to close achievement, health and development gaps, and can lead to benefits such as higher earnings that accumulate over a lifetime. The researchers suggest that closing these gaps is not just about education, but also about more broadly alleviating the budget constraints of families with young children. In order to access qualified jobs to overcome poverty, at least 10 to 12 years of education are required, which is almost equivalent to compulsory education. In addition, sub-national governments are responsible for compulsory education in almost all countries. That is why fiscal stable funding is essential in a decentralised setting. Given the governance structure of education in OECD countries, the stability of education funding is directly linked to a well-functioning fiscal decentralisation. As a result, the summary of previous studies suggests that inclusiveness via education can be achieved with sub-national governments' efficiency and efforts.

This chapter attempts to identify the linkage between fiscal decentralisation of education financing system and education performance by using OECD country data. There are several papers that discuss fiscal decentralisation and education performance. Most empirical studies agree that fiscal decentralisation has a positive effect on education performance. For example, Barankay and Lockwood (2006) support that decentralisation in the education sector has a positive impact on student performance.

This chapter provides one of the first empirical tests of the argument that fiscal decentralisation can increase the efficiency of government services, by looking at the association between expenditure decentralisation and the productive efficiency of government based on a dataset of Swiss cantons.

Freinkman and Plekhanov (2009) conclude that fiscal decentralisation has a significant positive effect on average examination results in Russia, controlling for key input variables and per capita regional government spending on education. Their paper points to the importance of the revenue side of fiscal decentralisation. Traditionally, compared to expenditure decentralisation, this area has been relatively neglected by the researchers of the Russian fiscal system. They repeatedly stress the importance of the decomposition of revenue and expenditure decentralisation in Russian regions. They insist that the revenue measure is more accurate for evaluating the efforts of local taxpayers by themselves, which is not easily captured by expenditure measures.

Akai et al. (2007) suggest that fiscal decentralisation is likely to contribute to higher education performance in secondary school. However, the effect is not discovered in elementary school because the positive incentive effect of decentralisation is neutralised by the negative effect on education performance at the elementary level. Busemeyer (2008) finds that fiscal decentralisation may have a positive effect on education spending and an adverse effect on public pension spending. Breunig and Busemeyer (2011) also find inclusiveness effects of fiscal decentralisation on education in later research.

Fredriksen (2013) analyses the link between decentralisation and the composition of public spending as well as the relation between decentralisation and education performance. The results of the study suggest that fiscal decentralisation increases the share of public investment in total government spending. Moreover, she estimated that every 10% point increase in decentralisation increases education performance by four PISA points. However, the empirical work in Fredriksen (2013) does not touch on the issue of income inequality and regional disparities within a country. Only education financing by local governments is considered for education performance.

Sacchi and Salotti (2011) emphasise that high regional disparities seem to be inversely correlated with expenditure decentralisation. They focus on the income inequality and regional disparities of fiscal decentralisation in industrialised countries. However, they do not explore the relationship between education expenditure and education performance.

Heredia-Ortiz (2007) looks at the link between education decentralisation and education outcomes, using international comparative data. The main contribution of the paper is to address the effect of fiscal decentralisation on the net enrolment rate at the primary level, repetition rates and international test scores (PISA). However, the paper does not consider the effect of other major mechanisms on education performance. Above all, student education performance is affected by parents' income levels and the degree of care. Since income inequality is a very important variable in explaining education performance, the empirical analysis needs to include such related variables.

These research findings provide strong evidence for a relationship between fiscal decentralisation and education expenditure/performance. This chapter focuses on inclusive growth. The negative effect of income inequality on PISA scores is more closely reviewed by decomposing the total sample into two groups in order to see the degree of sensitivity of public provision of education services. Additionally, regional disparities will be explained under the frame of fiscal decentralisation. This chapter

aims to find out if the allocation of education services is influenced by the adverse effect of regional disparities. The empirical relationship between fiscal decentralisation and education expenditure/performance points out that education may be a more highly prioritised sector through the budget process in region/municipalities governments.

Fiscal decentralisation and PISA results

Framework and data analysis

The analysis assumes three possibilities. This section constructs a stylised model to capture how decentralisation affects education outcomes. The empirical model tests the hypotheses and the model is mainly derived by Fredriksen (2013), where a particular type of spending is expressed as a function of a matrix of control variables and institutional variables. Following are the hypotheses to be tested. Pooled OLS estimation is used as the main statistical analysis tool.

Hypothesis 1: Fiscal decentralisation may increase education expenditure.
Hypothesis 2: Fiscal decentralisation may increase education performance.
Hypothesis 3: Individual income inequality and regional disparities decrease education expenditure and change education performance.

$$\mathrm{E_{jt}} = \beta_0 + \beta_1 X_{jt} + \beta_2 S_{jt} + \beta_3 D_{jt} + \beta_4 R_{jt} + \mu_j + \lambda_t + \nu_{jt}$$

$$\mathrm{F_{jt}} = \beta_0 + \beta_1 X_{jt} + \beta_2 S_{jt} + \beta_3 D_{jt} + \beta_4 R_{jt} + \mu_j + \lambda_t + \nu_{jt}$$

The data from 2005 to 2015 for OECD countries are based on OECD datasets. The dependent variables are the share of education expenditure in total expenditure and education performance. OECD National Accounts show an increase in the share of education expenditure to GDP and education expenditure in total budget expenditure (F_{jt}).

Education performance (E_{jt}) variables are represented by PISA results, which consist of three mean scores; for the total sample, the 90th and 10th percentile by academic subjects (OECD, 2014c). The average national PISA mean score represents a measure of of overall student achievement (average mean score = 1/3 score in mathematics + 1/3 score in science + 1/3 score in reading).

The model incorporates the factors shaping the education environment and affect education expenditure and performance. X_{jt} denotes the level of per capita GDP, fertility level, etc. from the World Bank Open Data (World Bank, n.d.). The model considers measures of the quality of education (S_{jt}) such as the number of students per class, number of students per teacher and salary of a teacher in the year 2014 as the independent variables (OECD, 2017a).

Which measures are appropriate and relevant to capture the reality of fiscal decentralisation is actively discussed. Various indicators have been used. The dominant indicators for fiscal decentralisation are the revenue and expenditure share of sub-national governments in total government revenue and spending. In this chapter, the variables for fiscal decentralisation (FD_{jt}) are taken from the *OECD Fiscal Decentralisation Database* (OECD, 2017b). The variables for revenue and expenditure decentralisation indicate the share of sub-national revenue and expenditure in total government revenue and expenditure. R_{jt} indicates gap variables such as the level of income inequality and regional disparities from *OECD Regions at a Glance*. For Gini

indices, disposable income is calculated on a post-tax and transfer basis. The data are aggregated according to the new OECD terms of reference. Compared to the previous terms of reference, these include a more detailed breakdown of current transfers received and paid by households as well as a revised definition of household income, including the value of goods produced for own consumption as an element of self-employed income. Subscript *j* and *t* denote country and year, respectively.

Table 6.1. **Empirical data from 2005 to 2015**

Category		Variables
E_{jt}	Education performance	PISA mean, 1st decile (90th percentile or above) and 10th decile (10th percentile) mean
F_{jt}	Public expenditure on education	Education expenditure/GDP Education expenditure/Total expenditure
X_{jt}	Level of education environment	Per capita GDP Fertility rates
S_{jt}	Quality of education	Number of students per class Number of students per teacher Salary of teacher in 15th year
D_{jt}	Fiscal Decentralisation	Share of sub-national expenditure Share of sub-national revenue
R_{jt}	Gini coefficient Regional gap Regional disparity	Coefficient of variation on "T2 level" from *OECD Regions at a Glance*

Source: Author.

The effect of fiscal decentralisation on education expenditure to GDP

The results are presented in Tables 6.2 through 6.5. First, this analysis broadly supports Hypothesis 1. The empirical findings suggest that fiscal decentralisation and balanced regional development may increase education expenditure. Both revenue and expenditure decentralisation tend to increase the ratio of education expenditure to GDP and education expenditure to total expenditure. Significant coefficients of fiscal decentralisation variables reconfirm the findings of previous studies: Fredriksen (2013), West et al. (2010) and Heredia-Ortiz (2007). In contrast, Busemeyer (2008) found an under-provision following an increase in decentralisation. He assumes that the declining trend of education expenditure is associated with the lower capability of local governments and politicians. Song (2010) also criticised the enhancement of education funding after the reinforcement of decentralisation. Local representatives elected by direct vote may have a strong political incentive for re-election by showing off their tangible achievements, such as social overhead capital (SOC) projects instead of the provision of education services. Finally, the current results support the positive aspect of fiscal decentralisation on education efficacy.

Second, regional disparities hurt the efficient allocation of national budgets, which may decrease education expenditure. This finding confirms the results of the existing literature, like Sacchi and Salotti (2011) and Sepulveda and Martinez-Vazquez (2011). High regional disparities seem to lead to larger equalisation grants. Then, the transferred money to lower levels of governments may be limited due to fiscal sustainability concerns. Therefore, the previous literature investigated whether fiscal decentralisation would tend to reduce the transfers to lower levels of government. Martinez-Vazquez (1982) finds that high regional disparities seem to be correlated with lower expenditure decentralisation. Third, the empirical setup also finds a relationship between inequality and education investment. When income inequality

worsens, OECD countries tend to spend more money on education in order to enhance educational opportunity for lower income groups. Interestingly, the robust coefficients of Gini indices are found in all the regression variants. These findings are in line with the previous result of Ostry et al. (2014). They conclude that more unequal societies tend to redistribute more resources. The correlation between inequality and redistributive efforts is stronger especially for advanced countries, but holds in developing countries, too. Again, this paper supports the tenet that one of the most efficient and fundamental redistribution tools is the expansion of education investment.

The impact of poverty on educational attainment is well known. Students from low-income families often start school already behind their peers from more affluent families. As found in this study, common policies to reduce income polarisation are the provision of education opportunities first, as well as the support of cash transfers to households.

Table 6.2. **The effect of fiscal decentralisation on education expenditure to GDP**

	(1)	(2)	(3)	(4)	(5)	(6)
Gini coefficient	4.48	9.272***	6.894**	8.458***	9.401***	8.588***
	(3.10)	(2.98)	(2.89)	(3.15)	(2.97)	(3.00)
Average class size	-6.226***	-4.880***	-5.673***	-2.729***	-2.601***	-2.720***
	(0.96)	(0.94)	(0.93)	(0.87)	(0.86)	(0.87)
Starting salary	-1.162*	0.721***		-0.09	0.43	
	(0.60)	(0.26)		(0.64)	(0.29)	
Salary of teachers in 15th year	2.524***		1.222***	0.68		0.584*
	(0.73)		(0.30)	(0.74)		(0.34)
Expenditure decentralisation	**3.174*** **	**2.821*** **	**2.981*** **			
	(0.69)	**(0.74)**	**(0.70)**			
GDP per capita	0.914***	1.282***	0.993***	1.090***	1.205***	1.095***
	(0.25)	(0.25)	(0.26)	(0.30)	(0.27)	(0.29)
Regional disparity	**-0.954*** **	**-1.148*** **	**-1.055*** **	**-1.023*** **	**-1.076*** **	**-1.030*** **
	(0.19)	**(0.19)**	**(0.18)**	**(0.21)**	**(0.20)**	**(0.20)**
Federal country dummy	-1.214***	-1.303***	-1.295***	-0.900***	-0.931***	-0.907***
	(0.20)	(0.21)	(0.20)	(0.19)	(0.19)	(0.19)
Revenue decentralisation				**2.565*** **	**2.544*** **	**2.546*** **
				(0.96)	**(0.96)**	**(0.94)**
Constant	-1.46	-3.18	-2.68	-5.840**	-5.829**	-5.892**
	(2.47)	(2.60)	(2.43)	(2.72)	(2.72)	(2.68)
Observation	76	76	76	80	80	80
R-squared	0.68	0.62	0.66	0.55	0.55	0.55

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Source: Author's calculations.

The effect of fiscal decentralisation on PISA scores

The simple correlation between fiscal decentralisation and PISA mean scores is intended to test Hypothesis 2. As also a number of papers show, this empirical study confirms that fiscal decentralisation may increase education performance as well. Both expenditure and revenue decentralisation are positively associated with education performance. Also, the effect of fiscal decentralisation on PISA scores is much more important for lower-scoring students than higher-scoring students. These findings have implications for policy making.

According to the magnitude of the coefficient, the effects of fiscal decentralisation on PISA scores are more powerful than those of the size of education expenditure. Even though one must be cautious in interpreting this relationship, the empirical work

suggests the following: the fiscal contribution by local taxpayers, rather than transfer from the central government, might have a greater influence on PISA scores. For example, in order to achieve a higher score, parents' income and teacher quality may be much more important than the physical infrastructure of classrooms and school buildings.

In order to more closely test the effects on education performance, as measured by the PISA mean score, this empirical study looks at two sub-groups: the 1st decile of the highest scores and the 10th decile of the lowest scores. For students in the highest score group, the coefficient of expenditure decentralisation is statistically insignificant, while that of revenue decentralisation is significant. These findings are able to be supported by market influence in an educational environment. While expenditure decentralisation is determined by transfer from central government, revenue decentralisation is strongly correlated with asset and income allocation by the market mechanism. So, the highest educational performers – the students in the 1st decile – might be supported by affluent parents in wealthy areas. It is well known that high income contributes to high education performance. As Freinkman and Plekhanov (2009) find, the effect of revenue decentralisation may provide "value for money" in the case of Russian municipalities.

In contrast, the effect of public expenditure decentralisation on the lowest educational performers in the 10th decile is significant. The coefficients of the revenue and expenditure decentralisation confirm Hypothesis 2, unlike in the case of 1st decile students. Therefore, this model also holds up: fiscal decentralisation may affect academic achievement.

The direct relationship between regional disparities and education performance is complex and not straightforward. This analysis also does not directly verify the relationship. However, an indirect relationship between regional disparities and education performance could still be explained with stepwise estimations. The first step would be to see if regional disparities decrease education expenditure, according to the above findings. The second step would follow from the following rationale: the rationale of the effect of regional disparities on education performance seems to come from lower education expenditure, when regional disparities are high. When regional disparity within a country rise, more equalisation grants seems to be granted. This tendency may reduce budgets, including for education. Then, lower educational investment leads to poor education performance, as seen by the literature and the above findings (see Figures 6.13 and 6.14).

Figure 6.13. **Sub-national expenditure share and PISA means**

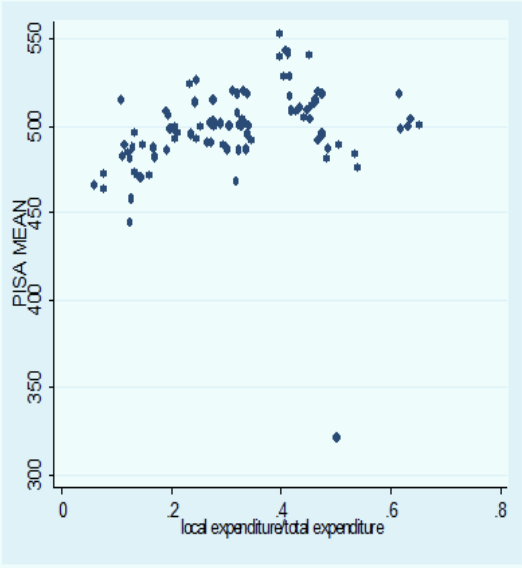
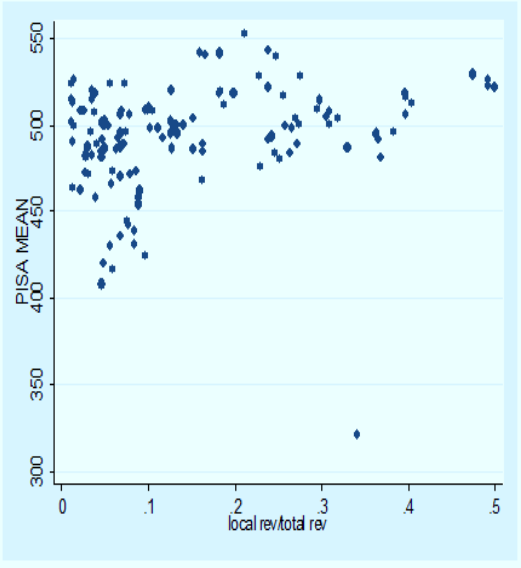


Figure 6.14. **Sub-national revenue share and PISA means**



Source: OECD *PISA Data* and OECD *Fiscal Decentralisation database* from 2005 to 2015.

Table 6.3. **The effect of fiscal decentralisation on PISA scores**

	(1)	(2)	(3)	(4)	(5)	(6)
Gini coefficient	-0.560**	-0.408*	-0.38	-0.878***	-0.786***	-0.754***
	(0.21)	(0.23)	(0.24)	(0.19)	(0.25)	(0.26)
Average class size	0.165**	0.274***	0.253***	0.138**	0.223***	0.186**
	(0.07)	(0.07)	(0.08)	(0.06)	(0.07)	(0.08)
Starting salary	-0.110***	-0.02		-0.154***	-0.03	
	(0.04)	(0.02)		(0.03)	(0.02)	
Salary of teachers in 15th year	0.117**		0.00	0.163***		0.02
	(0.05)		(0.02)	(0.04)		(0.03)
Education expenditure to GDP	0.0163*	0.0250***	0.0213**	0.01	0.02	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Expenditure decentralisation	**0.165*** **	**0.155** **	**0.156** **			
	(0.05)	**(0.06)**	**(0.06)**			
GDP per capita	0.00	0.00	0.00	0.00	0.02	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Regional disparity	**-0.01**	**-0.01**	**-0.01**	**0.00**	**0.00**	**-0.01**
	(0.01)	**(0.02)**	**(0.02)**	**(0.01)**	**(0.02)**	**(0.02)**
Federal country dummy	-0.0323*	-0.03	-0.0361*	-0.01	-0.01	-0.02
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Revenue decentralisation				**0.207*** **	**0.215** **	**0.184** **
				(0.06)	**(0.08)**	**(0.08)**
Constant	5.641***	5.580***	5.505***	5.828***	5.762***	5.612***
	(0.14)	(0.15)	(0.15)	(0.15)	(0.20)	(0.20)
Observation	28	28	28	29	29	29
R-squared	0.84	0.78	0.77	0.87	0.74	0.73

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Source: Author's calculations.

Table 6.4. **The effect of fiscal decentralisation on the PISA scores of the 1st decile**

	(1)	(2)	(3)	(4)	(5)	(6)
Gini coefficient	-0.674***	-0.547***	-0.547***	-0.819***	-0.777***	-0.816***
	(0.16)	(0.16)	(0.19)	(0.14)	(0.18)	(0.20)
Average class size	0.166***	0.247***	0.262***	0.109**	0.184***	0.182***
	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.06)
Starting salary	-0.102***	-0.0337**		-0.130***	-0.0336*	
	(0.03)	(0.02)		(0.03)	(0.02)	
Salary of teachers in 15th year	0.0911**		-0.02	0.128***		0.00
	(0.04)		(0.02)	(0.03)		(0.02)
Education expenditure to GDP	0.0113*	0.0174***	0.0168**	0.00	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Expenditure decentralisation	**0.05**	**0.05**	**0.04**			
	(0.03)	**(0.03)**	**(0.04)**			
GDP per capita	0.01	0.01	0.00	0.01	0.02	0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)
Regional disparity	**0.01**	**0.01**	**0.01**	**0.01**	**0.00**	**0.01**
	(0.01)	**(0.01)**	**(0.01)**	**(0.01)**	**(0.01)**	**(0.01)**
Revenue decentralisation				**0.111****	**0.116***	**0.08**
				(0.05)	**(0.06)**	**(0.07)**
Constant	6.064***	6.009***	5.948***	6.159***	6.125***	6.026***
	(0.11)	(0.12)	(0.13)	(0.11)	(0.15)	(0.16)
Observation	27	27	27	28	28	28
R-squared	0.80	0.74	0.69	0.87	0.76	0.72

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Source: Author's calculations.

Table 6.5. **The effect of fiscal decentralisation on the PISA scores of the 10th decile**

	(1)	(2)	(3)	(4)	(5)	(6)
Gini coefficient	-0.753**	-0.54	-0.56	-1.025***	-0.955**	-1.020**
	(0.35)	(0.34)	(0.37)	(0.30)	(0.36)	(0.37)
Average class size	0.326**	0.461***	0.471***	0.227**	0.352***	0.338***
	(0.12)	(0.10)	(0.11)	(0.09)	(0.10)	(0.11)
Starting salary	-0.154**	-0.04		-0.200***	-0.04	
	(0.07)	(0.03)		(0.06)	(0.04)	
Salary of teachers in 15th year	0.153*		-0.02	0.214***		0.01
	(0.09)		(0.04)	(0.07)		(0.04)
Education expenditure to GDP	0.0437***	0.0539***	0.0519***	0.0273**	0.0352**	0.0310**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Expenditure decentralisation	**0.186****	**0.182****	**0.163****			
	(0.07)	**(0.07)**	**(0.07)**			
GDP per capita	-0.04	-0.04	-0.05	-0.03	-0.01	-0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Regional disparity	**0.00**	**0.00**	**0.00**	**0.00**	**-0.01**	**0.00**
	(0.02)	**(0.02)**	**(0.02)**	**(0.02)**	**(0.03)**	**(0.03)**
Revenue decentralisation				**0.308*****	**0.316****	**0.265****
				(0.10)	**(0.12)**	**(0.13)**
Constant	5.274***	5.182***	5.098***	5.452***	5.393***	5.247***
	(0.24)	(0.25)	(0.25)	(0.25)	(0.29)	(0.29)
Observation	27	27	27	28	28	28
R-squared	0.75	0.71	0.69	0.78	0.66	0.64

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

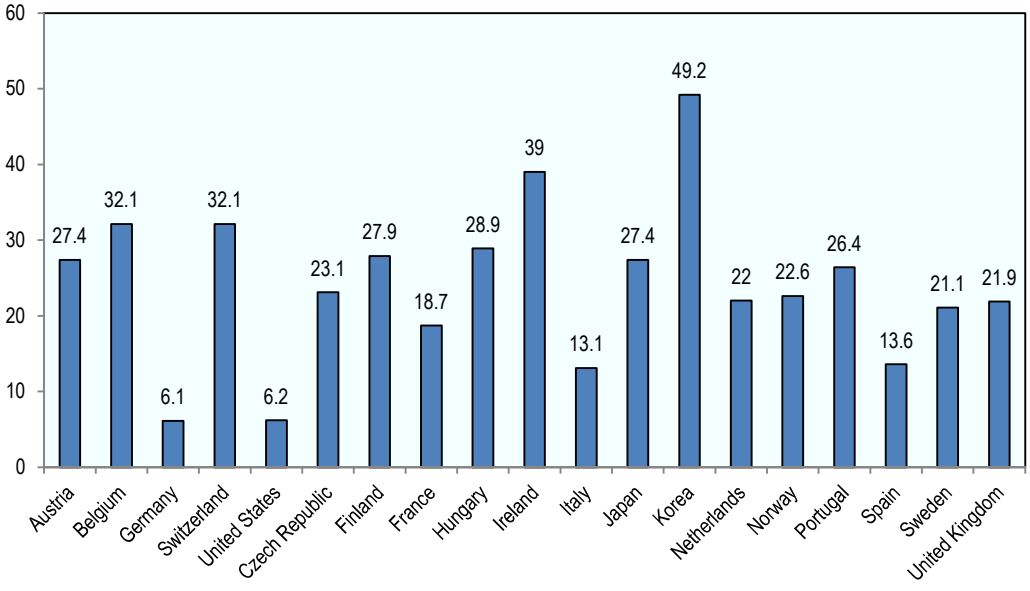
Source: Author's calculations.

Regional disparities and income inequality

Furthermore, the regressions in this chapter reconfirm several important implications of regional disparities. Regional disparities hurt fiscal decentralisation, inevitably leading to a high dependence on redistribution by the central government. Balanced development within a jurisdiction and between jurisdictions is very important for educational equality.

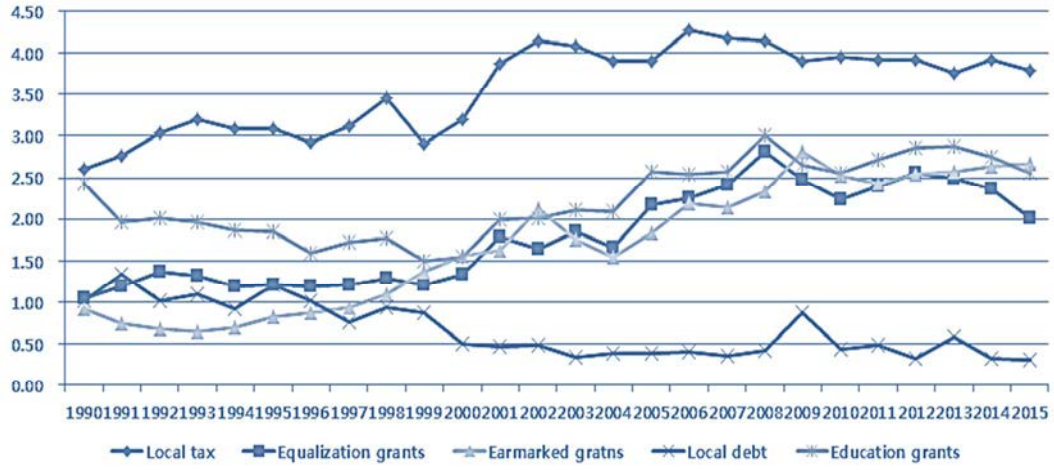
This analysis clarifies the relationship between regional disparities and income inequality. Simple correlation is shown in Figure 6.17. Regional disparities in each country negatively affect the budget allocation among levels of government. Korea is the country with the highest population concentration. The size of the population living in metropolitan areas in Korea was around 49.2%, already in 2008, according to OECD data. Regional disparities weaken the sub-national tax base and force increases in the transfer of central government. The portion of inter-governmental transfers is nearly the highest among OECD countries, according to the OECD Fiscal Decentralisation database (OECD, 2017b). The trend increase in education block grants and earmarked grants tends to continue and becomes a chronic problem (Figure 6.16).

Figure 6.15. **Percentage of metropolitan area population concentration in OECD countries, 2008**



Source: OECD (2009), *OECD Metropolitan Database*, http://stats.oecd.org/Index.aspx?Datasetcode=CITIES.

Figure 6.16. **Ratio of local tax and transfers to GDP in Korea, 1990-2015**



Source: KOSIS, *Statistical Year Book* (Yearly), Ministry of Interior and Home Affairs

Even though regional disparities do not affect education performance, lower education expenditure may adversely affect human capital formation. Moreover, regional disparities seem to be correlated with the level of national debt among OECD countries. Samans et al. (2015) mention that larger fiscal transfers are not necessarily incompatible with growth and competitiveness, and they are not always the primary or the most effective available option for broadening socio-economic inclusion.

As a result, regional disparities in OECD countries seem to have a negative impact on education expenditure and the size of intergovernmental transfers. Finally, this fact worsens the accumulation of human capital and national debt (Figures 6.17 and 6.18).

Figure 6.17. **Regional disparities and income inequalities**

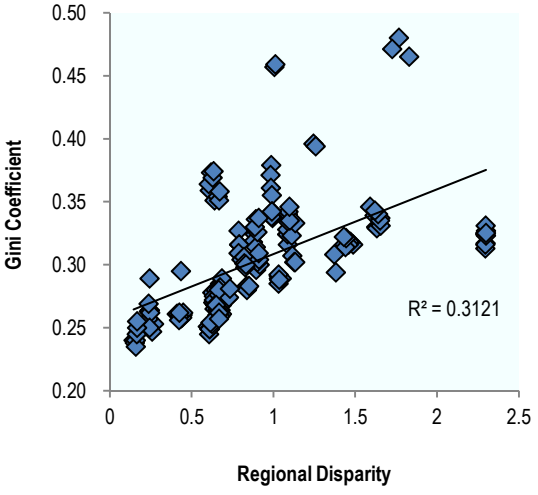
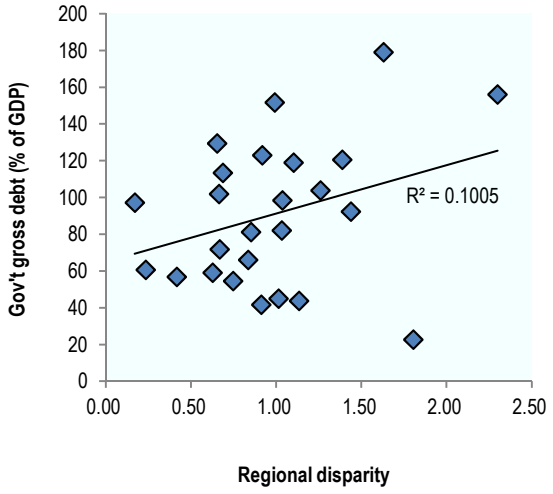


Figure 6.18. **Regional disparities and national debt**



Source: OECD *National Accounts*(Government gross debt) , *OECD Income Distribution Database(Gini coefficient, IDD)*(http://oecd.org/social/income-distribution-dadtabase.htm) and OECD *Regional Statistics and Indicators* (Author's calculation for Regional disparity, www.oecd.org/governancece/regional-policy/regionalstatisticsandindicators.htm) from 2005 to 2015.

Other education-related variables

The estimated results of other variables are also interesting. Recent research suggests that teacher expertise is much more important than class size for high quality education. The size of the average class tends to expand education expenditure. OECD countries have invested much money in reducing average class sizes as it has been believed that small class size is good for the quality of education. These empirical results, however, show that bigger classes positively affect PISA scores. Class size is not necessarily a major impact factor on the quality of education. This study also reconfirms previous research that 15th career-year teacher salaries may increase PISA scores, while starting-career-year teacher salaries may not do so. The result is consistent with the view that we cannot necessarily expect clear progress in education performance via quantity investment, such as small class sizes.

Policy implications for decentralisation and inclusive growth

Academic achievement reinforces the accumulation of human capital. The most obvious contribution of education is to improve employment and income. Even though there are discussions about the role of public education in education performance, fundamental opportunities and the educational environment depend on government education expenditure. Among government roles, this chapter focuses on early childhood education, primary, lower and upper-secondary education. In almost all OECD countries, sub-national governments are responsible for education funding.

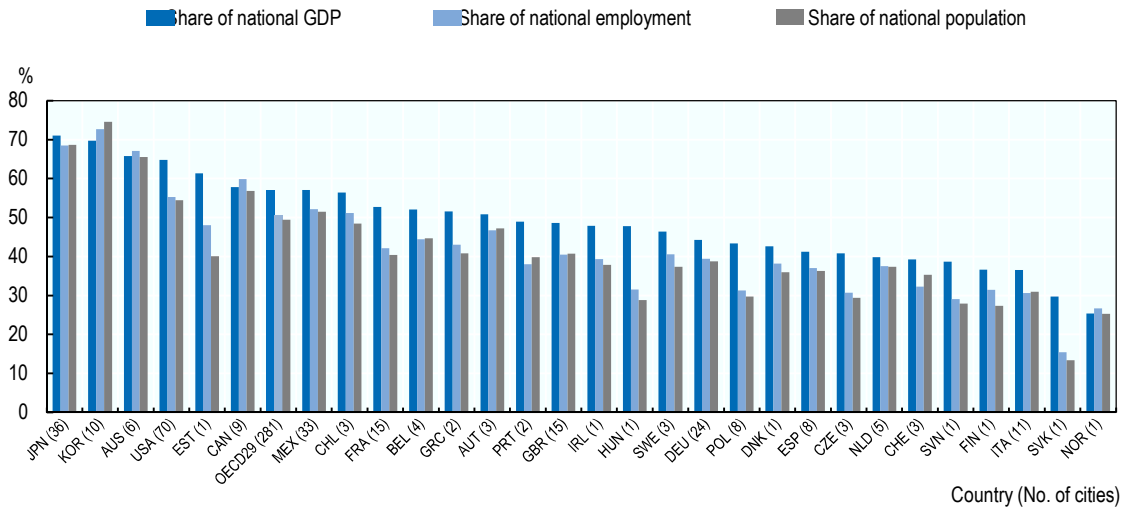
For sustainable education funding and higher education performance, this chapter finds a strong role for fiscal decentralisation, which implies the merger of the local public finance and education authority in the case of Korea. This empirical study confirms that the expansion of education expenditure through fiscal decentralisation is a consistent trend among OECD countries. Also, the effect of revenue decentralisation on education expenditure may be more powerful than expenditure decentralisation. Since sub-national governments do not have strong incentives to be efficient and effective in their spending if the spending is financed by central government grants, responsibilities should be transferred from central government. Furthermore, the chapter found evidence that fiscal decentralisation is associated with better educational achievement. One of the main findings is that there is a robust positive relationship between fiscal decentralisation and the productive efficiency of public-good provision in the case of education.

For inclusiveness, education policy should focus more on vulnerable social groups to mitigate income inequality. In order to encourage "the effect of climbing the income ladder", disadvantaged class-focused educational care should be provided to achieve inclusive growth through education. The empirical results support the intuition that reducing income inequality makes education investment more efficient.

Finally, this chapter also addressed the severity of regional disparities in the education sector. Especially for Korea, a variety of social policies should be introduced in order to mitigate regional disparities. Korea is the number one country to have diseconomies of scale among OECD metropolitan areas. The share of national GDP of metropolitan areas is less than that of national employment and national population (Figure 6.19). Previous governments as well as the new government have tried to solve this problem. To create a balanced distribution of population and balanced development of the nation, all ministries and public institutions moved from Seoul to

Sejong City, the new capital located in the middle of Korea. Moreover, the continuing trend of low economic growth and severe regional disparities in Korea exacerbates the budget environment for all sectors, including for education expenditure.

Figure 6.19. **Share of national GDP, employment and population in OECD metropolitan areas, 2013**



Source: OECD (2016a), *OECD Regions at a Glance 2016*, Chapter 2, Figure 2.24, http://dx.doi.org/10.1787/reg_glance-2016-en.

Conclusion

Education plays a crucial role in moving towards environmentally sustainable and inclusive economic growth. Education is the best way to mitigate poverty and close wage gaps. And, better education performance improves the quality of the stock of human capital, which in turn affects economic growth. This chapter focused on whether fiscal decentralisation can underpin the sustainability of education funding or not. The linkage between fiscal decentralisation and education expenditure/performance is examined by using data from OECD countries. The results clearly show the positive effect of fiscal decentralisation on education expenditure.

In addition, the results revealed how regional disparities affect education expenditure. The findings suggest that fiscal decentralisation and balanced regional development may increase the sustainable level of education expenditure. Regional disparities reduce the efficient allocation of national budgets and lead to the possibility of decreasing education expenditure. At the same time, no significant association has been found between regional disparities and education performance directly. The relationship seems to be indirect or not relevant, depending on the educational environment.

Finally, this empirical study confirms that OECD countries tend to spend more money on education to provide an educational opportunity for lower income populations when income inequality grows worse. The chapter explored not only mean-scored students, but also higher and lower-score students, according to PISA. According to the estimates, lower scoring student populations seem to be more responsive to public education spending. This provides a good indicator with regard to whether or not education policy should concentrate on low-scoring student populations

or on low-income households. Like many other papers that discuss the importance and effects of inequalities, this chapter also points out that income inequality is a fundamental factor that affects education expenditure and education performance.

With regard to policy, this chapter finds that fiscal decentralisation of education financing structure does not necessarily reduce education expenditure. Academic research suggests that fiscal decentralisation encourages the expansion of education expenditure and education performance. Local governments have incentives to increase education funding to raise education performance in their jurisdictions in OECD countries. The arguments for the positive effects of education decentralisation are now verified, from an evidence-based perspective.

The current local education governance in Korea has an entirely different system from that of the other developed countries. The administrative structure for education is separated from the structure for other local government functions, such as welfare, environment or waste disposal, resulting in inefficient resource utilisation. In this respect, Korea's local education governance needs to be restructured, meaning that education financing should be fiscally decentralised.

This study has been limited by the partial inclusion of education factors to determine education performance. Education performance is the result of complex inter-relations between parental income, parental education level and socio-economic and family structure variables. Not only do structural family factors and behaviours influence risk-taking and resilience in adolescents, but the cultural context of those inter-relations is likely to be strongly implicated in shaping those interactions (Agasisti and Longobardi, 2014; Boon, 2008). Although this chapter successfully verifies key hypotheses, a further study should elaborate the effect of school and family characteristics on education quality as well.

References

Agasisti, T. and S. Longobardi (2014), "Educational institutions, resources, and students' resilience: An empirical study about OECD countries", *Economics Bulletin*, Vol. 34, No. 2, pp. 1055-1067.

Akai, N. et al. (2007), "Fiscal decentralization and educational performance", Conference Paper No. C07-001, University of California, Berkeley.

Barankay, I. and B. Lockwood (2006), "Decentralization and the productive efficiency of government: Evidence from Swiss cantons", *IZA Discussion Papers*, No. 2477, Institute for the Study of Labour (IZA).

Boon, H. (2008), "Risk or resilience? What makes a difference?", *The Australian Educational Researcher*, Vol. 35, No. 1, April.

Breunig, C. and R. M. Busemeyer (2011), "Fiscal austerity and trade-off between public investment and social spending", *Journal of European Public Policy*, Vol. 19, Issue 6.

Busemeyer, R. M. (2008), "The impact of fiscal decentralization on education and other types of spending", *Swiss Political Science Review* 14(3).

Council of the Economic Advisors (2016), *2016 Economic Report of the President*, White House, https://obamawhitehouse.archives.gov/administration/eop/cea/economic-report-of-the-President/2016.

Freinkman, L. and A. Plekhanov (2009), "Fiscal decentralization and the quality of public services in Russian regions", *European Bank for Reconstruction and Development Working Paper*, No. 11.

Fredriksen, K. (2013), "Decentralisation and economic growth - Part 3: Decentralisation, infrastructure investment and educational performance", *OECD Working Papers on Fiscal Federalism*, No. 16, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k4559gg7wlw-en.

Heredia-Ortiz, E. (2007), "The impact of education decentralization on education output: A cross-country study", dissertation, Georgia State University.

KOSIS (KOrean Statistical Information Service) (n.d.), *Statistical Year Book* (Yearly), Ministry of Interior and Home affairs.

Martinez-Vazquez, J. (1987), "Fiscal incidence at the local level", *Econometrica 50(5),* 1207-1218, 1987

Morrone, A. et al. (2011), "Measuring vulnerability and resilience in OECD countries", paper prepared for the IARIW-OECD Conference on Economic Insecurity, Paris, 22-23 November.

OECD (2017a), "Teachers' salaries" (indicator), http://dx.doi.org/10.1787/f689fb91-en, (accessed on 18 November 2017).

OECD (2017b), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

OECD (2017c), *National Accounts at a Glance 2017*, OECD Publishing, Paris, http://stats.oecd.org/Government expenditure by function (COFOG)

OECD (2017d), *Education at a Glance 2017: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2017-en

OECD (2016a), *OECD Regions at a Glance 2016*, OECD Publishing, Paris, http://dx.doi.org/10.1787/reg_glance-2016-en.

OECD (2016b), *Education at a Glance 2016: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2016-en.

OECD (2015a), *National Accounts at a Glance 2015*, OECD Publishing, Paris, http://dx.doi.org/10.1787/na_glance-2015-en.

OECD (2015b), *All on Board: Making Inclusive Growth Happen*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264218512-en.

OECD (2015d), *Education at a Glance 2015*, *OECD Indicators*, OECD Publishing, Paris http://dx.doi.org/10.1787/eag-2015-en

OECD (2014a), *Education at a Glance 2014: OECD Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eag-2014-en.

OECD (2014b), "Country note: Korea", *Education at a Glance 2014*, www.oecd.org/edu/Korea-EAG2014-Country-Note.pdf.

OECD (2014c), "Science performance (PISA)" (indicator), http://dx.doi.org/10.1787/91952204-en (accessed on 18 November 2017).

OECD (2009), *OECD Metropolitan Database*, http://stats.oecd.org/Index.aspx?Datasetcode=CITIES.

OECD (n.d.), *Demography and Population Database*, http://stats.oecd.org/Index.aspx?DatasetCode=POP_FIVE_HIST.

Ostry, Jonathan D. et al. (2014), "Redistribution, inequality and growth," *IMF Staff Discussion Note* 14/02, www.imf.org/external/pubs/ft/sdn/2014/sdn1402.pdf.

OECD *Income Distribution Database(IDD)*, http://oecd.org/social/income-distribution-dadtabase.htm

OECD *Regional Statistics and Indicators*, www.oecd.org/governancece/regional-policy/regionalstatisticsandindicators.htm

Sacchi, A. and S. Salotti (2011), "Income inequality, regional disparities, and fiscal decentralization in industrial countries", paper prepared for the Workshop on Regional and Urban Economics: Inequality and Regional Growth and Cohesion, Barcelona 24-25 November 2011, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.470.8978&rep=rep1&type=pdf

Samans, R. et al. (2015), "The Inclusive Growth and Development Report 2015", *Insight Report*, World Economic Forum, September.

Sepulveda, C.F. and J. Martinez-Vazque (2011), "The consequences of fiscal decentralization on poverty and income inequality", *Environment and Planning C: Government and Policy* 29, pp. 321-343.

Song, K. (2010), "Tasks of local educational finance based on the change of local educational autonomy system", *The Journal of Economics and Finance of Education*, Vol. 19, No. 4, pp. 233-256.

Statistics Korea (2011), *Population Projection for Korea*, Statistics Korea.

West, A. et al. (2010), "Decentralisation and educational achievement in Germany and the UK", *Environment and Planning C: Government and Policy 28(3)*, pp.450-468.

World Bank (2014), *A Measured Approach to Ending Poverty and Boosting Shared Prosperity: Data, Concepts, and the Twin Goals*, DECRG Policy Research Report.

World Bank (n.d.), "World Bank Open Data: Population, Real GDP Forecast" (database), http://data.worldbank.org/.

Further reading

Kim, H. (2017), "Fiscal decentralization and education in Korea", working paper, Korea Institute of Public Finance.

OECD (2014), "Reading performance (PISA)" (indicator), http://dx.doi.org/10.1787/79913c69-en (accessed on 18 November 2017).

OECD (2017), "Income inequality" (indicator), http://dx.doi.org/10.1787/459aa7f1-en (accessed on 18 November 2017).

OECD (2014), "Mathematics performance (PISA)" (indicator), http://dx.doi.org/10.1787/04711c74-en (accessed on 18 November 2017).

OECD (2014), "Report on the OECD Framework for Inclusive Growth", OECD Ministerial Meeting, May, https://www.oecd.org/mcm/IG_MCM_ENG.pdf

Chapter 7

Local government revenue decentralisation and funding divergence: An English case study*

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For revenues, sub-national governments rely on a mix of grants from central government; locally-raised taxes; and locally-raised user fees and charges. It is not only the balance of these sources, but also the rules around tax and fee policy and fiscal equalisation that affect funding outcomes and the fiscal incentives faced by sub-national governments. We use an ongoing shift in England's local government finance system from equalising grants to a greater reliance on local tax revenues, aimed at incentivising growth, as a case study of the trade-offs between equalisation and incentives inherent in sub-national finance. In particular using data from 2006–07 to 2013–14, we show the significant fiscal disparities between local government units in England, and the factors that correlate with the size and changes in these disparities over time. We model proposed reforms to England's local government finance system and show that even if revenues are initially fully equalised relative to assessed spending needs, significant fiscal disparities can re-emerge in just a few years. However, the scale of these balances depends significantly on specific design choices such as marginal equalisation for those units seeing the largest shortfalls in revenue, and revenue sharing in areas with two-tier local government.

* The analysis in this chapter makes use of the IFS local government finance model, which was developed with financial support from the IFS's local government finance consortium: Capita, the Chartered Institute for Public Finance and Accountancy (CIPFA), the Economic and Social Research Council (ESRC), the Municipal Journal, PwC, the Society of County Treasurers, and a number of councils across England. However, the views expressed in this chapter are those of the authors alone. The authors also accept responsibility for any errors or omissions.

Introduction

In order to fund the areas of public spending for which they are responsible, local governments generally rely on three main sources of funding, the importance of which vary over time and across countries: grants from central government; locally-raised tax revenues; and locally-raised user fees and charges.[1] The effects of the finance system on funding outcomes and the fiscal incentives faced by local government depend not only on the balance of these sources, but the rules around local taxes and fees and the way in which central government grants are allocated. For instance, allocating grants in a way that accounts for differences in the ability to raise revenues locally and differences in local needs provides greater insurance and redistribution, but removes the fiscal incentive for promoting tax base growth or constraining spending needs. On the other hand, systems without such fiscal equalisation provide financial incentives to grow tax bases and constrain spending needs, but at a greater risk of significant divergences between local revenues and spending needs, much of which could relate to factors outside local politicians' control. There may therefore be a trade-off between promoting growth and ensuring that growth is inclusively shared across locales when designing local and other sub-national government finance systems.

This chapter uses an ongoing shift in England's local government finance system from equalising grants to a greater reliance on local tax revenues, aimed at incentivising growth, as a case study for these issues. In particular, using data from 2006–07 to 2013–14, we examine the historic relationship between local spending needs, as assessed by the central government, and local residential and non-residential property tax revenue capacity, as well as some of the factors that drive the patterns and trends in these variables. This allows us to model the extent to which different local government units (termed 'councils' in England) could have experienced divergence between their relative funding and their assessed relative spending needs during this period under a system of local tax revenue retention where, after an initial equalisation, there was no general system of ongoing marginal fiscal equalisation. This scenario is based on recent proposals for reform of the English local government finance system.

Understanding the potential scale of these divergences is an important part of determining an appropriate balance between equalisation and fiscal incentives in the local government finance system. Of course, one would also like to understand the impact of fiscal incentives on council behaviour and local and national economic and socio-economic outcomes. The fact that the first stage of the English reforms was rolled out nationally precludes us from doing that formally. However, our analysis of the relationship between changes in local tax revenue capacity and changes in broader measures of local economic conditions provides some suggestive evidence about the potential medium-term effects of incentives to grow tax bases. And we provide a brief review of the existing evidence on the effects of fiscal equalisation and incentives on sub-national government behaviour and outcomes.

While clearly of most relevance to the design of England's local government finance system, we hope that the analysis presented in this chapter is of interest more broadly, particularly for those countries considering changes to their own sub-national fiscal equalisation systems. The rest of this chapter proceeds as follows. First we define fiscal equalisation and provide a brief discussion of its potential effects and the empirical evidence on these. We then describe the English local government finance system and ongoing reforms, which could end ongoing marginal fiscal equalisation for

most councils. Following that we set out how we construct the measures of local spending needs and local property tax revenue capacity for our quantitative analysis of these reforms and show how these measures vary across councils in 2013-14 and how they changed over the preceding seven years from 2006-07. Given proposed reforms, we then use these measures to examine the extent to which, after an initial full revenue and needs equalisation, the relative funding of different councils would have diverged from their assessed relative spending needs over the seven year period, if there had been no ongoing marginal equalisation. We also examine how the splitting of revenues in areas where there are two tiers of local government and a proposed 'safety net' for those councils seeing particularly large falls in their non-residential tax revenues affects the extent of funding divergence. Finally, we conclude and suggest avenues for future research.

Fiscal equalisation and incentives

Given geographic variation in socio-economic conditions – such as the income of residents, the value of property and the distribution of business activity – the capacity of different local and other sub-national governments to raise their own revenues via the taxes assigned to them varies significantly. For instance, OECD (2013) reports that the sub-national unit with the highest tax-raising capacity had a capacity 650% greater than that with the lowest capacity in Australia, 140% greater in Canada, 70% greater in Germany, 200% greater in Spain and 50% greater in Sweden. Geographic variation in socio-economic conditions will also lead to differences in the costs sub-national governments face in providing the services they are responsible for and the need for these services. These differences in revenue-raising capacity and spending needs mean that, in the absence of intervention, areas with low tax revenue capacity and/or high needs would either need higher levels of sub-national taxation or lower levels of sub-national public service provision, potentially exacerbating pre-existing geographical inequalities.

Financial transfers from central government (termed ‘grants’) or between sub-national units can be used to address this issue: a process known as fiscal equalisation. In particular, redistribution of financial resources either explicitly or implicitly from areas with high tax revenue capacity and/or low spending needs, to areas with low tax revenue capacity and/or high spending needs, can in principle allow sub-national governments to implement more comparable levels of public service provision at comparable levels of local taxation. This contributes to greater horizontal and vertical equity in terms of access to local public services. Such equalisation can also provide an insurance mechanism for areas experiencing large changes in their relative revenues or spending needs and can, in principle, be a form of ‘automatic stabiliser’ for idiosyncratic macroeconomic shocks.

Blöchliger et al. (2007) examined the extent and nature of sub-national fiscal equalisation regimes in 18 OECD countries. They find that transfers aimed at fiscal equalisation averaged 2.3% of GDP in 2004, ranging from 0.5% in some countries to up to 4% in others.[2] The extent of equalisation provided by these transfers varies significantly. Focusing on variation in tax revenue capacity, OECD (2013) finds that fiscal equalisation eliminates all variation in tax revenue capacity in Australia and addresses a large majority of initial variation in countries such as Germany, Italy and Norway. In contrast, in Canada and Switzerland only around a third to a half of the initial variation is equalised away.

While some fiscal equalisation is generally required to prevent extreme differences in tax levels or public service provision across sub-national jurisdictions, there is a trade-off: distorted incentives in relation to tax revenue capacity and assessed spending needs. For instance, systems with a high degree of fiscal equalisation can disincentivise sub-national governments from promoting the expansion of their tax bases and reducing underlying spending needs, including via policies to boost local economic performance.

Direct empirical evidence on the importance of such disincentive effects is limited. This is because rather than examining the impact of fiscal equalisation specifically, the literature tends to focus on how the share of grant-funding versus tax revenues or measures of tax and spending autonomy affect economic performance. See for instance: Baskaran, Feld and Schnellenbach (2016); Baskaran, Feld and Neker (2017); Blochliger (2013); Bloechliger and Egert (2013), and Fredriksen (2013).

There is more evidence on the role of equalisation on sub-national tax revenues and policies. Baretti, Huber and Lichblau (2002) examine the impact on tax revenues of differences in the implicit marginal tax rates on additional revenues that different German Laender face as a result of the fiscal equalisation system. They find that higher marginal tax rates are associated with lower tax revenues, which they interpret as evidence of equalisation reducing incentives to enforce and collect taxes. Buttner (2006) and Smart (2007) find evidence that tax revenue equalisation leads to sub-national tax rates being set higher than they otherwise would be in both Germany and Canada. This is because tax revenue equalisation means sub-national governments receive additional transfers which offset, at least in part, any falls in their tax bases when they increase their tax rate.

In contrast, a system with limited fiscal equalisation will avoid such distortions, providing sub-national governments with stronger incentives to boost local economies, grow tax bases and tackle underlying spending needs.[3] However, the flip side of this is greater disparities between the fiscal capacity of different sub-national governments to provide public services for their residents. There may, therefore, be a trade-off between promoting growth and ensuring the benefits of that growth, in the form of additional resources for local public services, are inclusively shared across jurisdictions.

Despite this tension, the extent of fiscal equalisation provided by different countries' sub-national finance systems has historically been persistent. However, recent years have seen a number of countries implement significant reforms to their sub-national government finance systems often aimed, in part, at providing stronger incentives to grow tax bases. As discussed in the next section, England is one such country, with ongoing reforms potentially exposing local governments to both stronger fiscal incentives and fiscal risks, especially in relation to non-residential tax revenues.

The English local government finance system

English local government is responsible for funding and delivering a wide range of public services, including waste collection and disposal, public libraries and leisure centres, maintenance of local roads and support for local buses, adult social care and family support services.[4] The structure for delivering these services varies across the country. In more urban areas, a single local authority (or 'council' as they are commonly known) is responsible for funding these services: these are variously called unitary authorities, metropolitan districts or London boroughs, depending on location.

In more rural areas, responsibilities are split between lower-tier 'shire district' councils and upper-tier 'county' councils (which cover several shire districts).

To fund their wide-ranging responsibilities, councils have traditionally relied upon a mix of government grants and their own property tax revenues, albeit to different extents over time and across the country. By the end of the 2000s the system was as follows. Councils had nominal control over the headline rate of recurrent domestic property tax, which since 1993 has been known as the `council tax', and notionally retained the revenues from it.[5] However, the majority of their general revenues came from a central government grant, which was funded in large part by a non-residential property tax known as 'business rates' that was collected by councils but then pooled at the national level. This grant funding was allocated so as to compensate councils both for differences in their council tax bases and their assessed spending needs, although damping arrangements to prevent large changes in grants when equalisation formulae were reformed or updated mean that full equalisation of revenues and assessed needs was not achieved.[6] Nevertheless, the funding system prioritised equalisation of fiscal resources over incentives for spending needs constraint and local tax base growth, especially in the case of fully-pooled business rates.

The business rates retention system (BRRS)

A concern that such an approach to funding local government disincentivised councils from expending effort (and potentially political capital) on boosting local economies and local tax revenues on the one hand, and reducing underlying spending needs on the other, led the UK's coalition government of 2010–15 to begin a major shift in the local government funding regime in England. Most significantly, since April 2013, the business rates retention system (BRRS) means that 50% of business rates revenues are retained by local government rather than being transferred to central government and redistributed via grant funding, with grant funding correspondingly reduced. In areas with two-tier government, lower-tier shire districts were initially allocated 40% of business rates revenues, and county councils up to 10%,[7] and in London, 30% of business rates revenues were initially allocated to London boroughs and 20% to the Greater London Authority (which has responsibility for regional transport and economic development in London).

However, if councils in each local area ultimately kept 50% of the business rates revenues raised in their area, the BRRS would have led to large and immediate changes in many councils' overall revenues. This is because, as we show in Section 4, the business rates tax base is very unequally distributed across England. To avoid this happening, the BRRS includes a system of redistributive transfers between councils, which works as follows:

- Prior to the start of the scheme, an assessment was made of the amount of business rates revenue each council would require such that alongside its income from council tax and the central government grant, it would be no better or worse off in the first year of the scheme than if the BRRS had not been introduced. This was termed its *baseline funding level* (BF).
- An assessment was also made of the amount of business rates revenues each council would have in the first year of the scheme given the share of local revenues allocated to it under the BRRS (e.g. 40% for a shire district council), if those revenues grew in line with forecast revenue growth for

England as a whole. This was termed the council's *business rates baseline* (BB).

- Those councils where the need for business rates revenue exceeded their assessed business rates revenues (i.e. those with BF>BB) received a funding 'top-up' to make up the difference (i.e. equal to BF-BB). These top-ups were paid for by 'tariffs' on those councils where assessed business rates revenues exceeded the assessed need for business rates revenue (i.e. those with BB>BF).
- Subsequently, these top-ups and tariffs have been increased in line with the retail price index (RPI) each year, maintaining their real-term value.

The up-shot of this inflation-indexing of tariffs and top-ups is that local areas kept up to 50% of the real term increase in business rates revenues, and bore up to 50% of any real term fall in business rates revenues. The BRRS therefore reduces marginal equalisation of changes in the business rates tax base, but maintains full equalisation of the initial real-terms stock of business rates revenues.

Four further features of this reform are worth highlighting:

First, those councils seeing large real term falls in their business rates revenues are protected by a 'safety-net' which prevents their funding from business rates falling below 92.5% of their inflation-indexed baseline funding level.

Second, changes in business rates tax bases and revenues associated with the periodic revaluation of non-residential properties are stripped out of the system by making offsetting changes to councils' top-ups and tariffs. The aim of this is to prevent large overnight changes in funding if revaluation leads to large increases or decreases in particular councils' business rates tax base. Thus councils' incentives under the BRRS relate to increases in the quantity and quality of non-residential floor space rather than increases in the value of that floor space at revaluation.

Third, the initial allocation of 40% of local business rates revenues to lower-tier shire districts in areas with two-tier local government means that these councils are much more exposed to changes in business rates revenues, and thus the incentives provided by such exposure, than upper-tier counties. Counties' initial allocation of up to 10% of local business rates revenues mean that they instead rely on inflation-indexed top-ups for most of their funding via the BRRS, reducing the revenue risk they face. The rationale for these allocations is that shire districts have responsibility for the property planning system and are thus expected to be able to respond more effectively to the fiscal incentives. Conversely, counties have responsibility for key adult social care and family services and are thus thought to benefit more from reduced revenue risk.

Finally, alongside the BRRS, the government also stopped updating the annual assessments of relative spending needs and local council tax bases in 2013–14. Thus if assessed relative spending needs or council tax bases change, councils no longer see offsetting changes to their grant funding. Divergences between assessed spending needs and local revenues were to be prevented from growing indefinitely by periodic resets of funding according to relative spending need, first in 2020 and then every 10 years thereafter. Overall though, the introduction of the BRRS has meant a significant shift from fiscal equalisation towards the provision of fiscal incentives for tax base growth and spending need constraint.

Extending the BRRS

In October 2015 it was announced that in an effort to further strengthen fiscal incentives, local areas would retain 100% of the real-terms growth in business rates revenues by 2020.[8] When combined with proposals to abolish remaining grant funding and make the periodic resets only partial – so that a proportion of any changes in spending needs and tax bases would continue to be borne locally following the reset – this '100% BRRS' would represent a further move towards emphasising fiscal incentives over fiscal equalisation.

The original timetable for these proposals will not be met: legislation required to take forward key parts of the plan was not resurrected following the UK's June 2017 general election. However, the government has announced plans to increase the share of business rates retained by local government to 75% by 2020–21, and is continuing to pilot the 100% BRRS in particular parts of England to ascertain the feasibility and desirability of a national roll-out (Department for Communities and Local Government, 2017b). Analysis of the proposal therefore remains relevant in an English context, and to other countries potentially considering similar reductions in the degree of marginal fiscal equalisation in their local or other sub-national government finance system.

In this study, we examine the scale of divergences between councils' relative revenues and relative spending needs that could arise if marginal equalisation was ended, utilising spending needs assessments and tax revenue capacity data for the period between 2006–07 to 2013–14. In particular, after setting out how assessed needs and tax revenue capacity varies across councils and how this changes over this period, we model the extent to which the relative funding available to different councils could have diverged from their assessed relative spending needs over this 7-year period under a version of the 100% BRRS.

It is worth noting that the analysis is conducted under the assumption that revenue capacity and spending needs would be unaffected by such a change in the fiscal equalisation regime. We make this assumption not because we believe it to be strictly true but because of an absence of relevant quantitative evidence on the size (and even the direction) of these impacts. Our analysis can therefore be thought of as examining the first-round static effects of a 100% BRRS on funding divergences.

Tax revenue capacity and assessed spending needs in England

The first stage of examining the relationship between tax revenue capacity and assessed spending needs is to set out how we construct our measure of these variables. After doing this, we then analyse how tax revenue capacity and assessed spending needs varied across England in 2013–14, and how these variables changed over the preceding seven years.

Measuring local tax revenue capacity

Under a 100% BRRS, English councils' general revenues would consist of two main sources: business rates and council tax.[9] Business rates are a recurrent tax on the rental value of non-residential properties which are re-valued every five years. These revaluations redistribute rates liabilities between properties and councils, but are designed to leave the average liability unchanged at the national level. Large changes in tax liabilities as a result of revaluation are phased in over several years under a

'transitional relief' scheme, and otherwise, rates bills increase in line with RPI inflation each year by default between revaluations. Discounts (termed 'reliefs') are available for a range of occupiers, including small businesses occupying low-value properties, charities and temporarily empty properties.[10] Council tax is a recurrent tax on residential property based on the estimated capital value of the property as of April 1991. Properties are placed into one of eight bands (A to H), with the tax due on the highest-valued properties three times that due on the lowest-valued properties, meaning the tax is regressive with respect to property value, especially at the top end. Discounts are available for properties occupied by students, single adults and disabled people.[11]

We define the local revenue capacity of these taxes as the amount of revenue that would be raised if the tax rate for each was set equal to the respective national average tax rate. Thus variations in revenue capacity relate to variation in the size of local tax bases rather than local tax rates.

During the period we examine, business rates were set centrally, so there is no variation in business rates tax rates. We therefore use actual tax revenues from non-domestic properties in each area as the basis of our measure of revenue capacity.[12] Council tax rates, however, are determined locally and there was (and remains) wide variation in council tax rates around England. We therefore recalculate what council tax revenues would be if each council set its council tax rates at the national average level in each year.[13] Our measure of revenue capacity for council tax therefore differs, sometimes significantly, from actual council tax revenues for individual councils.[14]

Measuring spending needs

Assessments of relative spending needs in England during the period in question were based on a series of formulae called Relative Needs Formulae (RNF) that calculated needs for each service area on the basis of councils' geographic, demographic and socio-economic characteristics. These characteristics include measures of population sparsity and density, population age structure, and measures of deprivation and social transfer receipts and are meant to reflect both local residents' needs for different services and the costs different councils face in providing these services due, for instance, to local labour and property markets.[15] The RNF were based on a combination of estimated statistical relationships between spending and local characteristics, judgements based on qualitative research and in some instances the past expenditure of the council in question. Assessments for each service area were weighted to provide an assessment of overall relative spending needs for each council.

A number of issues arise with this approach. First, there is inevitably a degree of subjectivity in assessing needs. Second, some of the data used in the RNF are only available with a significant lag or are only updated infrequently. Thus assessed needs may lag changes in real needs, and may change discontinuously when updated data is available. Third, the use of statistical analysis of past spending patterns means there is a risk that the formulae will be biased. This is because past spending patterns will reflect factors – such as differences in preferences for local public spending, or differences in funding availability – that may be correlated with underlying spending needs. Finally, the formulas used and weights given to different service areas can change over time as central government priorities change, which might lead to changes in the assessed relative needs of different councils even if their underlying needs levels have not changed.

We utilise these official relative needs assessments as no other measure of councils' spending need is available. However, when analysing changes in spending needs over time, rather than using the changing formulas and weights applied in each year, we use the formula for 2006–07 for each year and apply this to the relevant year's data. Doing this means our analysis reflects changes in the underlying characteristics of local areas, as opposed to changes in formulas, or changes in priority given to different service areas. However, it also means that our analysis cannot pick up genuine changes in the links between local characteristics and spending needs either (e.g. due to changes in the production function for council-provided services).

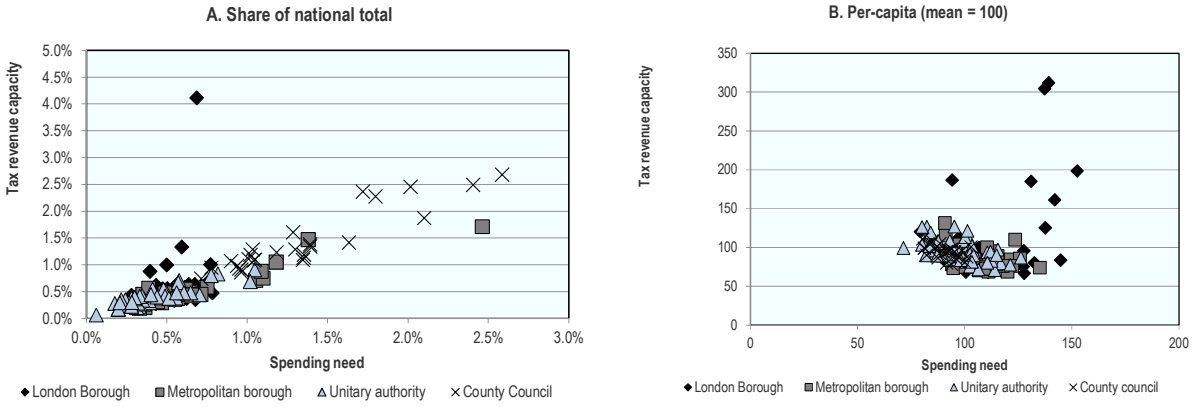
The distribution of tax revenue capacity and assessed spending needs in 2013–14

We now turn to our empirical estimates of relative spending needs and tax revenue capacity. Here and when examining changes in revenues and needs over time, the tax revenue capacities and assessed spending needs of counties and the shire districts within them are pooled in two-tier areas to allow comparisons to be made with areas of England with single-tier local government. However, when we go on to model the local government funding system we do so at the level of each individual council, to show how the two-tier structure of local government affects the scope for funding divergences in two-tier areas.

Figure 7.1 shows the relationship between the assessed relative spending needs and tax revenue capacity of different council areas: panel A in the aggregate and panel B on a per capita basis. Differences in population unsurprisingly explain a large part of the differences in aggregate spending needs (95%) and aggregate revenue capacity (65%) between council areas. There is thus also a strong positive correlation between the levels of aggregate spending needs and aggregate revenue capacity. Panel B shows a rather different story for the per capita measures. Whilst there remains a positive correlation overall, this is driven by a few outliers in London. In fact, there is a statistically significant negative relationship between tax revenue capacity and assessed spending needs per capita outside of London: in a linear OLS regression, each 1 percentage point increase in assessed relative spending needs per capita is associated with a 0.52 percentage point *decrease* in relative tax revenue capacity per capita.[16] Table 7.1 provides further information on the extent of variation in tax revenue capacity and spending needs per capita, both of which are normalised so that the mean for England as a whole equals 100.

Looking first at tax revenue capacity, business rates are much more unevenly distributed across councils than is council tax. For instance, the 10th percentile of business rates revenue capacity is 40% below the mean, compared to 20% below for council tax. And the highest council tax revenue capacity is around 90% above the mean, compared to 1 700% above average for business rates. This reflects the more discrete nature of non-residential property and its concentration in particular locales, most notably parts of inner London.

Figure 7.1. **Relative tax revenue capacity and assessed spending needs, 2013–14**



Note: Panel A excludes the City of London and Isles of Scilly and Panel B excludes these councils and the City of Westminster. These outliers are excluded so that general patterns are easier to see.

Sources: Authors' calculations using Department for Communities and Local Government (2013a, 2013b), The Chartered Institute of Public Finance and Accountancy (2016), and Office for National Statistics (2015a).

Table 7.1. **Variation in tax revenue capacity and spending needs per capita (mean=100) and fiscal gap per capita (measured as % of spending needs), 2013–14**

Measure	Tax revenue capacity			Spending needs	Fiscal gap
	Council tax	Business Rates	Total		
Minimum	68.4	42.4	66.6	71.5	-47.8%
10th percentile	80.7	59.6	74.6	84.3	-34.8%
25th percentile	87.9	68.1	80.9	92.5	-25.2%
Median	97.3	79.9	89.7	100.8	-10.3%
75th percentile	108.4	99.3	101.7	111.2	+9.5%
90th percentile	117.1	130.8	117.3	124.8	+30.5%
Maximum	190.7	1801.8	975.7	163.1	+498.4%
Coefficient of Variation	17.0%	142.6%	77.0%	15.4%	N/A

Note: Excludes City of London and Isles of Scilly. Fiscal gap is calculated as (revenue capacity – spending needs)/spending needs.

Sources: As Figure 7.1.

There is also significant variation in assessed spending needs: the 10th percentile for assessed spending need is 16% below the average for England as a whole, while the 90th percentile is 25% above. However, the highest level of assessed spending need per capita is 63% above the average for England as a whole, so that the overall degree of variation in spending needs is substantially lower than for business rates revenue capacity and overall tax revenue capacity.

Table 7.1 also shows the distribution of the difference between councils' relative tax revenue capacities and their assessed relative spending needs. We term this difference their fiscal gap, which we calculate as:

(tax revenue capacity – spending needs per capita)/(spending needs per capita)

The fiscal gap thus measures the percentage by which the tax revenue capacity per capita of a council area is above or below its assessed relative spending needs per capita. Thus, the Table shows that 10% of council areas had a tax revenue capacity that was 34.7% or more *below* their assessed relative spending needs in 2013-14. Conversely, another 10% had a tax revenue capacity of 30.1% above their relative spending needs. And one council had a tax revenue capacity almost 500% above its assessed relative spending need. It is therefore clear that in the absence of any revenue or needs equalisation, there would be significant differences in the fiscal capacity of councils across England.

To explore the local characteristics associated with assessed spending needs per capita and tax revenue capacity per capita, we run a series of OLS regressions, reported in Table 7.2. Column (1) shows that around 30% of the variation in assessed spending needs per capita can be 'explained' by the median wage of local residents, the median wage of local workers, the ratio of workers[17] to residents, and the share of residents living in areas defined as rural. Column (2) shows that adding the council area's average Index of Multiple Deprivation (IMD) score[18] and the share of the population aged 65 or over increases the explanatory power of the regression to 85%. The strongest predictor of assessed spending need is IMD score, with a 1 standard deviation increase in IMD score associated with an 18.4 point increase in assessed spending needs (where the mean assessed spending need across England is 100).[19] This likely reflects the fact that many of the indicators used in the needs assessment are similar to those used to construct the IMD. Controlling for IMD score, increases in the share of the population living in rural areas are associated with higher assessed needs, as are increases in the ratio of workers to residents. This likely reflects the inclusion of measures of population sparsity in commuter inflow in the RNF formulae. More surprising is that increases in the median wage of local residents are strongly associated with increases in assessed spending needs once one controls for IMD score. This seems to be driven largely by the fact that London has both high levels of assessed needs (even controlling for IMD) and high median wages: if London boroughs are excluded from the regression, the coefficient on residents' median wages is no longer statistically significant.

Columns 3 and 4 of the Table show that tax revenue capacity per capita is positively correlated with both the median wage of local residents and with local gross value added (GVA) per capita. The relationship with GVA per capita is particularly strong: a 1 standard deviation increase is associated with a 78.5 point increase in tax revenue capacity per capita (where the mean tax revenue capacity per capita for England 100).[20] While these correlations do not necessarily imply a causal link between median residents' wages, GVA per capita and tax revenue capacity per capita, they are suggestive evidence of such a link, at least in the long term.

Table 7.2. **OLS regressions of assessed spending needs and tax revenue capacity per capita on various local characteristics, 2013–14**

	Spending needs per capita		Tax revenue capacity per capita	
	(1)	(2)	(3)	(4)
Median wage of local residents	-5.87***	8.46***	28.8***	10.2**
	(1.64)	(1.01)	(8.48)	(3.73)
Median wage of local workers	5.39**	0.39	9.08	-25.5***
	(1.78)	(0.96)	(8.48)	(3.04)
Employment density	4.82***	1.92***		5.39
	(1.18)	(0.57)		(3.47)
Share of population living in a rural area	-4.86***	3.90***		-1.58
	(1.19)	(0.76)		(2.39)
IMD score		18.4***		0.65
		(0.86)		(2.79)
Share of population aged 65 or over		0.73		
		(0.95)		
GVA per capita				78.5***
				(4.17)
Constant	103.0***	103.0***	102.2***	102.2***
	(1.11)	(0.52)	(5.75)	(1.79)
Sample-size	150	150	150	150
R-squared	0.307	0.849	0.210	0.925

Notes: Excludes City of London and Isles of Scilly. Standard errors in parentheses. * indicates significance at the 5% level,

** at the 1% level and *** at the 0.1% level.

Sources: As Figure 7.1. Resident wage data from ONS (2013a); Workplace wage data from ONS (2013b); Employment density calculated using workplace population statistics from ONS (2015b); Share of population living in a rural area calculated using ONS (2011); IMD score using DCLG (2015); GVA data from ONS (2016).

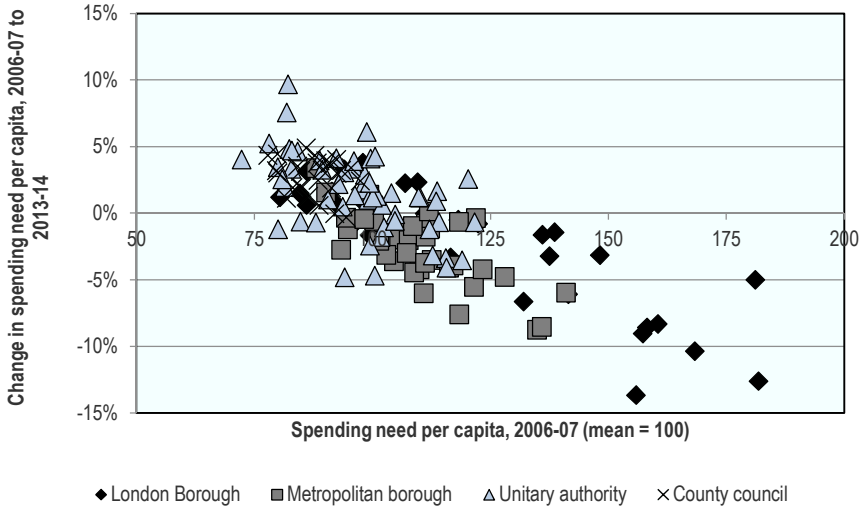
Changes in tax revenue capacity and assessed spending needs, 2006–07 to 2013–14

While it is important to understand how assessed needs and tax revenue capacity are distributed across councils, it is changes in these variables over time that matter more for potential funding divergences under the BRRS.[21] Furthermore, proposals for continued full or partial re-equalisations on a periodic basis mean that the relationship between relatively short-term changes in assessed needs, tax revenue capacity, and local socio-economic conditions may be more important for the incentive effects of the scheme. Thus, we turn to examining how assessed relative needs per capita and tax revenue capacity per capita changed over the period 2006–07 and 2013–14 and the relationship of these changes to local socio-economic variables.

Figure 7.2 shows that there were significant changes in assessed relative spending needs per capita during this period: in 10% of upper tier areas assessed needs per capita fell by 5% or more relative to the mean for England as a whole, while in another 10% they increased by 4% or more. The Figure also shows a strong (and statistically significant as shown in column (1) of Table 7.3) negative correlation between a

council's initial level of spending need per capita and subsequent changes in its relative need per capita, such that the assessed spending needs of councils converged somewhat over this period.

Figure 7.2. **Change in assessed relative spending needs per capita 2006–07 to 2013–14, by initial level of assessed relative spending needs per capita in 2006–07**



Notes: Excludes City of London and Isles of Scilly.

Sources: Authors' calculations using DCLG (2013a) and ONS (2015a).

The OLS regression results reported in column (2) of Table 7.3 provide further insight into these changes. Estimates show that increases in the share of the population that is aged 65 and over, and increases in a council's average IMD score are positively correlated with increases in assessed relative spending needs per capita. For instance, an increase in the change in average IMD score of one standard deviation is associated with a change in assessed relative spending need per capita that is 1.18 percentage points higher. These correlations help explain the convergence in assessed spending need per capita shown in Figure 7.2: areas with initially higher levels of assessed spending needs saw relatively slow growth in the share of their population that was aged 65 or over and saw a fall in relative levels of deprivation as measured by the IMD. Furthermore the results suggest the formal ending of ongoing marginal equalisation of needs in 2013–14 may have strengthened fiscal incentives for councils to tackle deprivation, helping foster a focus on inclusive growth.

Table 7.3. **OLS regressions of changes in assessed relative spending need between 2006–07 and 2013–14**

	(1)	(2)
Index of spending needs per capita, 2006-07	-3.10***	
	(0.19)	
Change in residents' median wage		-0.29
		(0.26)
Change in workers' median wage		-0.59*
		(0.27)
Change in share of population over 65		1.52***
		(0.28)
Change in IMD score		1.18***
		(0.27)
Constant	-0.12	-0.12
	(0.19)	(0.0025)
N	150	150
R-squared	0.633	0.406

Notes: Excludes City of London and Isles of Scilly. Standard errors in parentheses. * indicates significance at the 5% level, ** at the 1% level and *** at the 0.1% level.

Sources: As for Table 7.2, and DCLG (2011).

Figure 7.3 shows that unlike assessed relative spending needs, tax revenue capacity per capita did not converge over the period 2006–07 to 2013–14.[22] However, there was significant variation in the changes in tax revenue capacity per capita: in a tenth of council areas, the increase per capita was 23% or more, while in another tenth it was 10% or less.

Figure 7.3. **Change in tax revenue capacity per capita 2006–07 to 2013–14 by initial level of tax revenue capacity per capita in 2006–07**

Note: Figure excludes the City of London, Westminster, and the Isles of Scilly.

Source: As Figure 7.1.

Table 7.4 reports results from a series of OLS regressions of changes in tax revenue capacity per capita and changes in various local characteristics. There is a highly statistically significant and positive relationship between the change in the share of the population that is aged 65 or over and tax revenue capacity per capita, both for business rates and council tax: the reasons for this relationship are unclear. However, there is little correlation between changes in tax revenue capacity per capita and changes in median wages or changes average IMD scores. This suggests little medium-term relationship between changes in local tax revenue capacity and inclusive local growth.

This lack of relationship between changes in relative tax revenue capacity and changes in relative economic prosperity is further illustrated in Figure 7.4. This shows that for the period 2010–11 to 2015–16, there was no relationship between changes in the rateable value of non-domestic property per capita – i.e. the business rates tax base – and growth in GVA per capita of council areas. As this is a period during which there was no revaluation of non-domestic properties, this implies that there was no relationship between changes in the underlying quantity and quality of non-domestic floor space, and changes in GVA per capita. There was also no relationship between the change in rateable value per capita and the number of jobs per capita in an area during the same period.[23] This lack of a link between changes in broad measures of local economic performance and changes in the underlying business rates tax base suggests that even if the BRRS incentivised councils to take action to boost the business rates tax base, this may not translate into improvements in local prosperity.

Table 7.4. **OLS regressions of changes in tax revenue capacity per capita, 2006–07 to 2013–14**

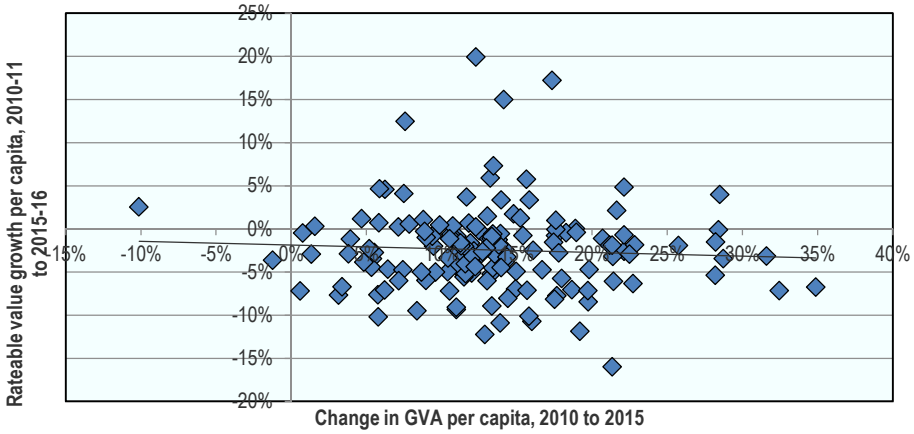
	Change in business rates revenue capacity per capita, 2006-07 to 2013-14		Change council tax revenue capacity per capita, 2006-07 to 2013-14		Change in overall tax revenue capacity per capita, 2006-07 to 2013-14	
	(1)	(2)	(3)	(4)	(5)	(6)
Level of dependent variable, 2006-07	-0.34		0.73*		0.51	
	(0.56)		(0.32)		(0.35)	
Change in residents' median wage		-0.15		0.47		0.22
		(0.55)		(0.27)		(0.32)
Change in workers' median wage		0.84		0.23		0.44
		(0.56)		(0.28)		(0.33)
Change in share of population over 65		2.87***		2.23***		2.16***
		(0.58)		(0.29)		(0.34)
Change in IMD score		-0.31		0.46		0.24
		(0.57)		(0.28)		(0.34)
Constant	0.080	0.080	-0.26	-0.26	-0.39	-0.39
	(0.56)	(0.52)	(0.32)	(0.26)	(0.35)	(0.31)
N	150	150	150	150	150	150
R-squared	0.002	0.157	0.034	0.379	0.014	0.267

Notes: Excludes City of London and Isles of Scilly. Standard errors in parentheses. * indicates significance at the 5% level, ** at the 1% level and *** at the 0.1% level.

Sources: As Table 7.3.

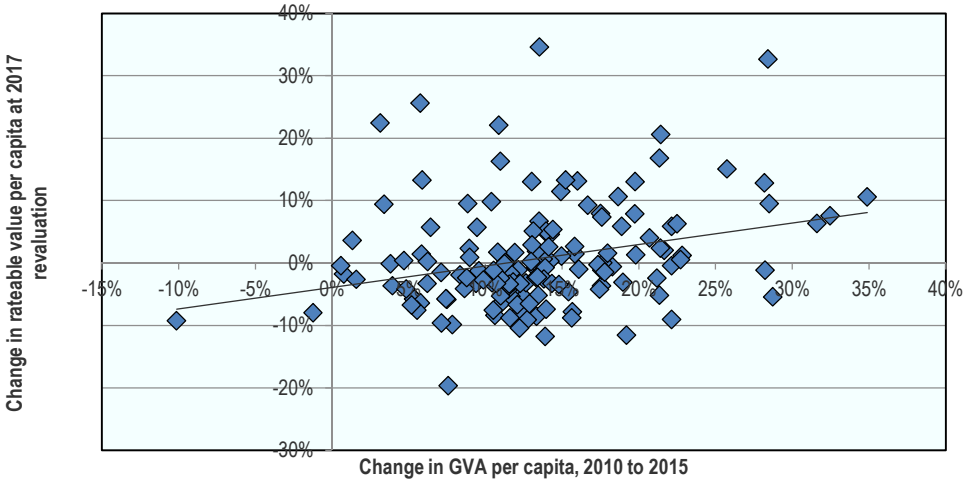
In Figure 7.5, by contrast, we find that growth in local GVA is modestly but statistically significantly positively correlated with the change in rateable values that resulted from the 2017 revaluation, which updated property values from their estimated April 2008 level to their estimated 2015 level. In an OLS regression, a 1 standard deviation increase in local growth in GVA is associated with the change in rateable values at the 2017 revaluation being 2.35 percentage points higher.[24] The relationship between changes in non-domestic property values at revaluation and GVA growth in the preceding period suggests that stripping out the impact of revaluations under the BRRS (by changing redistributive top-ups and tariffs) may be limiting the extent to which the BRRS provides an incentive to boost local economic growth.[25]

Figure 7.4. **Relationship between the change in rateable value per capita and change in local GVA per capita, 2010–11 to 2015–2016.**



Sources: GVA and population as in Table 7.2; Rateable values from CIPFA (2016).

Figure 7.5. **Relationship between the change in rateable value per capita as a result of the 2017 revaluation and change in local GVA per capita, 2010–11 to 2015–2016**



Sources: GVA and population as in Table 7.2; Revaluation data from Valuation Office Agency (2017).

Modelling a 100% BRRS for the period 2006–07 to 2013–14

We now turn to modelling the extent to which the relative funding for different councils could have diverged from their assessed relative spending needs during the period 2006–07 to 2013–14 under a hypothetical 100% BRRS. These divergences would have depended upon both the changes in relative spending and tax revenue capacity during this period, and the specific parameters of the implemented BRRS, such as the share of business rates accruing to each tier of local government in two-tier areas, and the setting and indexing of top-ups and tariffs.

The specific scheme we model has the following features:[26]

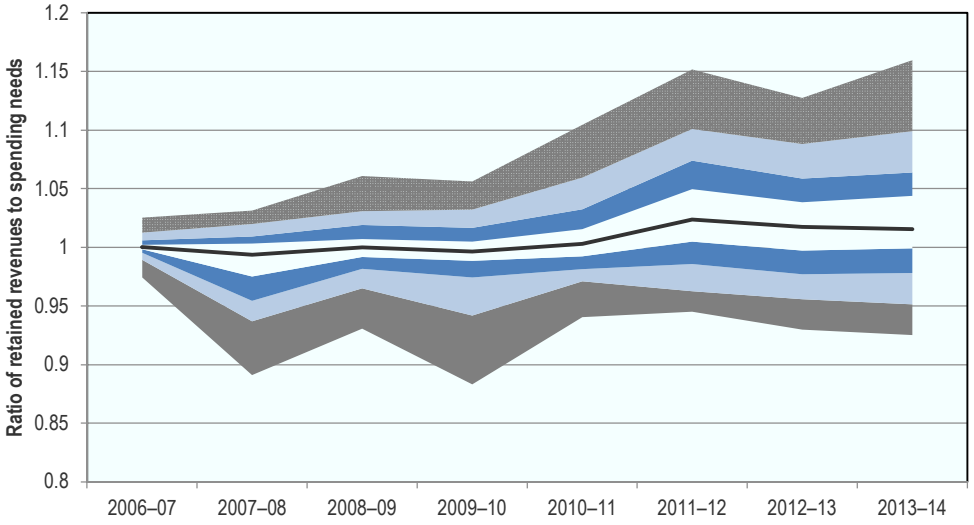
- Each council retains in full the amount of council tax it would raise if it set its council tax rate at the national average level.
- Business rates revenues are allocated in full to local government.
- In our baseline scenario, we allocate 80% of business rates revenues to lower-tier shire districts and 20% to upper-tier counties in two-tier areas, and we allocate 60% to London boroughs and 40% to the GLA in Greater London. This is based upon scaling up the parameters of the existing 50% BRRS. However, we also test the extent to which the scale and pattern of funding divergences would have varied under different tier-shares in two-tier areas.
- As under the 50% BRRS, a series of redistributive top-ups and tariffs is set up with the aim of providing a full equalisation of revenues and spending needs at the start of the scheme. However, differences between revenue outturns and the forecasts used to set the top-ups and tariffs mean that full equalisation is not achieved in practise in the first year of the scheme.
- These top-ups and tariffs are then indexed in line with RPI inflation each year, and are adjusted to strip out the effect of the revaluation of non-domestic property in 2010.

Such a system would have meant that that councils bore all of the real-terms changes in both their tax revenue capacity (with the exception of changes as a result of the business rates revaluation), and 100% of the changes in their relative spending needs from 2006–07 onwards. In other words, the system would have ended ongoing marginal fiscal equalisation. At the end of this section, we model the effect of applying a safety-net at 97% of inflation-indexed baseline funding levels, which would provide full marginal equalisation of changes in business rates revenues once revenues fell below this level. This is the safety-net level in areas piloting the 100% BRRS.

To examine the scale of divergences in relative funding that this system would have led to over the period in question, we calculate the ratio of each council's share of the national sum of locally retained revenues (accounting for top-ups and tariffs) to its share of the national sum of assessed relative spending needs. We term this a council's *relative funding ratio* and it measures the proportion by which a council's share of retained revenues is higher or lower than its share of assessed relative spending needs: a value <100% means a council's share of retained revenues is lower than its share of assessed relative spending needs, while a value >100% means it is higher.

Figure 7.6 shows how the distribution of these relative funding ratios would have changed between 2006–07 and 2013–14 under our baseline scenario. It is a fan-chart: each pair of coloured bands represents 20% of councils, with 10% of councils above and 10% below the dark grey bands. The Figure shows that relative funding ratios would have quickly diverged over time. For instance in 2006–07, one-in-ten councils would have had a relative funding ratio of less than 97.4% and another one-in-ten would have had a ratio of more than 102.5%. Just one year later in 2007–08, the corresponding figures would have been 89.1% and 103.1% respectively, and in 2013–14 they would have been 92.5% and 116%.

Figure 7.6. **Evolution of the distribution of relative funding ratios under baseline 100% BRRS scenario, 2006–07 to 2013–14**



Notes: Excludes City of London and Isles of Scilly.

Sources: As Figure 7.1.

The most extreme ratios would have been substantially larger again: column (1) of Table 5 shows that in 2013–14, the lowest relative funding ratio for a council would have been 61% and the highest ratio 166.4%. Such large differences in levels of funding relative to assessed needs would have likely meant either significant differences in the quantity and quality of public services provided by the councils in question or significant differences in the council tax rates they would have to set.

It is worth noting though that the initial equalisation via redistributive top-ups and tariffs would have significantly reduced the funding divergences that would otherwise have arisen in a 100% BRRS. To illustrate this, column (2) of Table 7.5 shows summary statistics of the distribution of the ratio of revenues to assessed spending needs in 2013–14 if there were no tariffs and top-ups and each council retained in full the revenues initially assigned to it under our baseline version of the BRRS. It shows that under such a scenario, one-in-ten councils would have had a relative funding ratio of 73.9% or less and another one-in-ten would have had a relative funding ratio of 263.7% or more. These large disparities reflect, in part, the significant differences and (outside London) the negative correlation between tax revenue capacity and assessed spending needs per capita that we discussed above. However, they also reflect the assignment of 80% of business rates revenues to lower-tier shire districts and 20% to upper tier counties in two-tier areas of England: without top-ups and tariffs, such an assignment would mean revenues significantly exceeding assessed spending needs in most shire districts but being significantly less than assessed spending needs in most counties. The rationale for such an assignment is to provide strong incentives to shire districts – which have responsibility for the property planning system – to grow the business rates tax base, and provide insurance against changes in the business rates tax base to counties – which have responsibility for key adult social care and family support services. But it also increases the amount of fiscal equalisation required of the top-ups and tariffs.

Table 7.5. **Distribution of relative funding ratios in 2013–14 under different funding schemes**

Relative funding ratio	Baseline 100% BRRS	No top-ups or tariffs	Top-ups and tariffs adjusted for changes in assessed needs	Funding adjusted for changes in tax revenue capacity
	(1)	(2)	(3)	(4)
Minimum	61.0%	46.3%	66.6%	88.4%
10th percentile	92.5%	73.9%	94.9%	95.1%
25th percentile	96.3%	90.5%	97.6%	97.4%
Median	101.5%	149.3%	100.4%	100.3%
75th percentile	107.5%	210.6%	106.5%	103.3%
90th percentile	116.0%	263.7%	115.4%	106.0%
Maximum	166.4%	466.0%	159.2%	123.4%

Notes: Excludes City of London and Isles of Scilly.

Sources: As Figure 7.1.

Table 7.5 also examines the extent to which the funding divergences under our baseline 100% BRRS are driven by changes in the tax revenue capacity or the assessed spending needs of councils.[27] Column (3) shows how relative funding ratios vary when top-ups and tariffs are adjusted for changes in assessed needs: variation in relative funding ratios therefore reflects changes in councils' tax revenue capacities. Column (4) shows how relative funding ratios vary when variation is the result of changes in assessed spending needs alone. Comparison of the distributions of relative funding ratios for these two scenarios shows that changes in tax revenue capacity drive the largest funding divergences under our baseline 100% BRRS.

Effect by council type

Table 7.6 shows the extent to which relative funding ratios vary separately by council type for our baseline 100% BRRS. The top panel shows figures for 2013–14, the final year of our simulation. The bottom panel shows figures averaged over the period 2007–08 to 2013–14. The first thing to note is that variation in relative funding ratios is significantly lower when averaged over the period 2007–08 to 2013–14 than it is in 2013–14 alone. This reflects both that it can take time for changes in assessed spending needs and tax revenue capacity to develop, and that volatility in business rates revenues in particular means that averaging over several years will reduce variation. However, especially for some shire districts, divergences between relative funding levels and relative assessed spending needs are still large when averaged over the full period. Such long-term funding divergences would also be more likely to affect the quantity and quality of services the councils in questions could provide than shorter term divergences.

Also notable are the differences in the distributions of relative funding ratios of shire districts and counties. For instance, the councils with both the highest and lowest relative funding ratios in 2013–14 and on average over the period 2007–08 to 2013–14 under this baseline scenario are shire districts. On the other hand, the variation in relative funding ratios among shire counties is the lowest of any council type.

Table 7.6. **Variation in relative funding ratios under baseline 100% BRRS, by council type**

Measure	Council Type				
	London	Metropolitan	Unitary	Shire District	County
Relative Funding Ratio in 2013–14					
Minimum	87.2%	96.5%	89.6%	61.0%	91.0%
25th percentile	93.4%	99.6%	94.8%	99.0%	94.4%
Median	95.8%	104.4%	100.0%	104.9%	95.5%
75th percentile	102.9%	107.0%	102.3%	112.2%	96.6%
Maximum	120.3%	114.6%	116.0%	166.4%	101.4%
Coefficient of Variation	7.30%	4.71%	5.88%	11.98%	2.66%
Average Relative Funding Ratio, 2007–08 to 2013–14					
Minimum	94.1%	97.8%	91.1%	78.1%	96.2%
25th percentile	98.0%	99.9%	97.3%	96.8%	97.4%
Median	99.6%	101.5%	99.2%	101.7%	97.8%
75th percentile	101.9%	103.3%	101.2%	105.6%	98.7%
Maximum	107.3%	107.5%	106.0%	140.6%	100.0%
Coefficient of Variation	3.09%	2.63%	3.12%	8.46%	1.01%

Notes: Excludes City of London and Isles of Scilly.

Sources: As Figure 7.1.

Two factors play a role in this. First, counties cover several shire districts, and therefore have significantly larger populations and underlying tax bases than shire districts. This larger scale reduces the variability of both tax revenue capacity and assessed spending needs. For instance the building or demolition of a factory will have less impact on the business rates tax base of a county consisting of multiple shire districts than that it will have on the tax base of the specific shire district that factory is located in. Second, as already highlighted, in our baseline scenario 80% of business rates revenues are initially allocated to shire districts and 20% to counties. Shire districts then typically pay significant inflation-indexed tariffs, while counties typically receive significant inflation-indexed top-ups. Hence, shire districts are much more exposed to real-term changes in local business rates revenues than counties, increasing the scope for divergences between retained revenues and assessed spending needs. This is the flip side of the stronger fiscal incentives provided by their 80% share of business rates revenues.

Table 7.7 shows the impact of changing the share of business rates revenues allocated to shire districts and counties in two-tier areas on the distributions of relative funding ratios. Columns (1) and (4) show estimates for the baseline 80%/20% split; columns (2) and (5) show estimates for a 50%/50% split; and columns (3) and (5) show estimates for a 20%/80% split.

Table 7.7. **Variation in relative funding ratios under versions of the 100% BRRS with different tier-shares for counties and shire districts**

Measure	Shire Districts			Counties		
	80/20 split	50/50 split	20/80 split	80/20 split	50/50 split	20/80 split
Relative Funding Ratio in 2013–14						
Minimum	61.0%	74.0%	87.0%	91.0%	91.3%	91.5%
25th percentile	99.0%	99.1%	98.2%	94.4%	94.8%	95.2%
Median	104.9%	102.7%	100.9%	95.5%	96.0%	96.5%
75th percentile	112.2%	107.9%	104.1%	96.6%	97.6%	98.9%
Maximum	166.4%	143.6%	120.8%	101.4%	103.3%	105.1%
Coefficient of Variation	11.98%	8.04%	4.48%	2.66%	3.00%	3.03%
Average Relative Funding Ratio, 2007–08 to 2013–14						
Minimum	78.1%	86.4%	93.9%	96.2%	95.8%	95.5%
25th percentile	96.8%	98.5%	100.5%	97.4%	97.3%	97.3%
Median	101.7%	101.0%	100.9%	97.8%	97.9%	98.0%
75th percentile	105.6%	103.8%	102.1%	98.7%	98.5%	99.2%
Maximum	140.6%	125.4%	111.4%	100.0%	100.6%	101.3%
Coefficient of Variation	8.46%	5.33%	2.45%	1.01%	1.24%	1.55%

Notes: Excludes City of London and Isles of Scilly.

Sources: As Figure 7.1.

Reducing the share of business rates allocated to shire districts in two-tier areas significantly reduces the extent of divergences between retained revenue shares and assessed spending needs shares among shire districts. For instance, the coefficient of variation of shire districts' relative funding ratios in 2013–14 falls from 11.98% under the baseline 80%/20% split to 4.48% under a 20%/80% scheme. Counties, of course, see the opposite pattern, although the effect is much smaller: the coefficient of variation of counties' relative funding ratios in 2013–14 increases from 2.66% to 3.03% for the same change in tier-splits, for instance. This relatively small impact reflects the fact that counties' larger scale means their business rates tax bases are less variable than those of the smaller shire districts, and as well as larger council tax revenue capacities. Shifting the initial allocation of business rates revenues in two-tier areas from shire districts to counties would therefore reduce the overall scale of divergences between councils' retained revenues and assessed spending needs in two-tier areas. However, this does not necessarily mean that such a shift would be desirable. As discussed already, the rationale for the shares allocated to shire districts and counties under the existing 50% scheme – on which our baseline 100% BRRS is based – is to provide strong fiscal incentives to shire districts to grow the business rates tax base and provide insurance against changes in the business rates tax base to shire counties. The appropriate share of business rates to allocate to shire districts and counties under a 100% BRRS would depend upon the extent to which each tier could act upon the fiscal incentives provided, and their ability to bear revenue risk, not just the scale of funding divergences that would result.

Table 7.7 also illustrates that the high share of business rates revenues allocated to shire districts is one of the reasons why under our baseline 100% BRRS, the median shire district has a relative funding ratio (104.9% in 2013–14) that compares favourably to that of the median county (95.5% in 2013–14) .This high share would have meant that shire districts paid inflation-indexed tariffs. However, the proportion of local business rates revenues they retain after tariffs would increase if there was real-term growth in business rates revenues, which was the case on average across England during this period. This would increase their relative levels of funding.

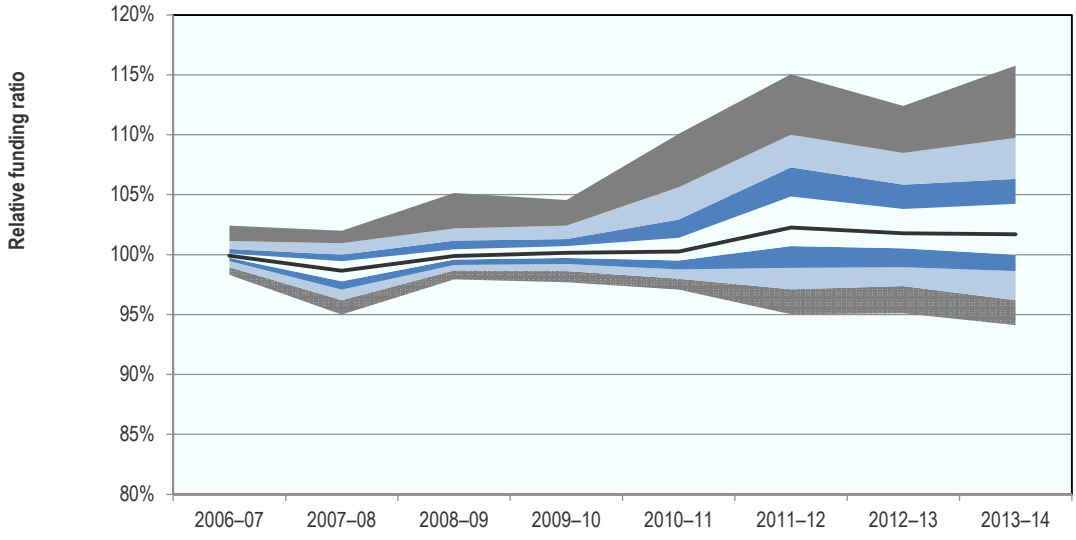
Conversely counties, reliant on inflation-indexed top-ups, would see a fall in their relative levels of funding as their top-ups lagged behind real-terms growth in business rates revenues. Table 7.7 shows that as the share of business rates allocated to shire districts falls and that of shire counties rises, the difference in the median relative funding ratio of shire districts and counties falls. This reflects the fall in the extent to which the median shire district, and the increase in the extent to which the median county benefit from the real-terms growth in business rates revenues.

The inflation-indexation of top-ups and tariffs also has a more general effect when business rates revenues increase in real terms: less affluent areas with small business rates tax bases and/or high assessed spending needs that rely on top-ups for a significant proportion of their revenue end up with a shrinking share of overall business rates revenues, unless rates revenues grow at a rate greater than the national average.[28] This could be seen as penalising less affluent areas and could be addressed by indexing top-ups and tariffs to growth in national business rates revenues, which would still maintain incentives for councils to grow their tax bases (Amin-Smith et al, 2016).

The effect of a safety net

We finally model the effect of a 'safety net' set at 97% of inflation-indexed baseline funding in our baseline 100% BRRS. Councils whose retained business rates revenues fall below this level are compensated by payments equal to the difference between their revenues and 97% of inflation-indexed baseline funding. Figure 7.7 shows how the distribution of relative funding ratios would have evolved between 2006–07 and 2013–14 under this scenario. Like Figure 7.6 it is a fan-chart: each pair of coloured bands represents 20% of councils, with 10% of councils above and 10% below the dark grey bands.

Figure 7.7. **Evolution of the distribution of relative funding ratios under baseline 100% BRRS scenario with a safety net of 97% of baseline funding, 2006–07 to 2013–14**



Notes: Excludes City of London and Isles of Scilly.

Sources: As Figure 7.1.

Comparison of Figure 7.6 (where there is no safety-net) and Figure 7.7 shows that the safety net reduces the extent to which relative funding ratios diverge over time, by preventing the largest shortfalls in funding. For instance, in the absence of a safety net one-in-ten councils would have had a relative funding ratio of 92.5% or less in 2013–14, and the lowest relative funding ratio would have been 61%. With a safety net set at 97% of inflation-indexed baseline funding, the corresponding figures would have been 94.1% and 87%, respectively. However the insurance provided by the safety net comes at a cost: reduced incentives for business rates revenue growth for those councils receiving safety net payments as such growth is at least partially offset by reduced safety net payments.

Discussion and conclusions

Ongoing changes to England's local government finance system are reducing the degree of marginal fiscal equalisation, with the aim of giving local government stronger incentives to grow local tax bases, reduce underlying spending needs, and more generally boost economic growth and tackle deprivation. In other words the changes are designed to provide councils with stronger incentives for inclusive growth.

The positive correlation between changes in councils' deprivation levels and changes in their assessed relative spending needs per capita over the seven year period examined in this chapter suggests that ending the annual updating of councils' funding as assessed needs change will strengthen fiscal incentives for councils to tackle deprivation. However changes in councils' tax revenue capacity were uncorrelated with changes in local GVA per capita, median wages or deprivation. This suggests that even if ending ongoing marginal revenue equalisation provided an effective incentive to councils to grow their tax bases, such growth might not necessarily be reflected in improvements in broader economic prosperity. In part this may reflect the relatively narrow tax base of English councils: a residential property tax called council tax, the values for which have not been updated since 1991; and a non-residential property tax called business rates which excludes many small properties, and for which changes in revenues due to periodic revaluations are redistributed rather than retained locally. A broader local tax base, as is the case in many other counties – including a local income tax, perhaps – may provide a stronger fiscal incentive for inclusive growth.

The main focus of this chapter has been modelling the extent to which the relative funding of different councils could diverge under a version of the proposed 100% business rates retention scheme: that is a system without ongoing marginal fiscal equalisation. Significant and sustained differences across councils in levels of funding relative to spending need would likely mean significant differences in the quantity and quality of public services available to citizens of different councils. Modelling suggests that while for most councils, relative levels of funding would have remained close to assessed relative levels of spending needs if such a system had been in place between 2006–07 and 2013–14, some councils would have experienced significant divergences between their funding and assessed needs, driven to a large extent by changes in business rates revenues. A system of 'safety net' payments to compensate councils seeing significant falls in their business rates revenues – as exists currently and is proposed to continue – therefore addresses the most significant funding shortfalls that would otherwise have arisen. But the 100% marginal equalisation rate for business rates revenues for councils in receipt of safety net payments significantly reduces the fiscal incentive for such councils to grow their business rates tax base. And

divergences in funding due to changes in council tax bases, relative spending needs, and other councils seeing significant increases in their business rates revenues would not be addressed by these 'safety nets'. Thus, proposed periodic full or partial re-equalisations of revenues and assessed needs would usefully complement the insurance provided by 'safety nets', but would still ensure medium-term incentives to boost tax bases and reduce spending needs.

Similar modelling exercises could be undertaken in other countries to examine the potential effects of reforms to fiscal equalisation regimes on divergences in sub-national funding allocations. These effects will depend not only on the change in the fiscal equalisation system itself but also the wider policy context including the tax bases and powers devolved to sub-national governments; the spending areas sub-national governments are responsible for; and the scale and socio-economic diversity of sub-national government units. For example, funding divergences are likely to be greater when sub-national government units are small. Such factors will also affect the incentives created by changes in fiscal equalisation regimes, and sub-national governments' ability to respond to those incentives. A more ambitious analysis would therefore consider how changes in sub-national powers, structures and fiscal equalisation interact to generate effective incentives for promoting inclusive growth.

Notes

1. Figures for OECD countries are available as part of the Fiscal Decentralisation Database, available at: http://oe.cd/fiscalnetwork.
2. OECD (2013) finds the average scale of transfers in 2012 was 2.5% but does not provide estimates for specific countries.
3. Boadway and Shah (2009) highlight that fiscal equalisation can have efficiency as well as equity benefits though, if it helps curb fiscal competition between sub-national jurisdictions.
4. Funding for many public schools and housing benefit payments – which help low income households pay rent on their homes – also flows via English local government. However, this expenditure is funded via separate ring-fenced grants rather than general grants and local tax revenues, and an increasing number of schools are funded directly by central government. For this reason, we exclude funding for and need for schools, housing benefit and other areas funded via specific grants from the quantitative analysis later in this chapter.
5. This remains the case today, although councils planning large increases in tax rates need to obtain support in a referendum of local residents.
6. A more detailed description of the allocation of grants in England in the late 2000s can be found in Amin-Smith et al. (2016), with Gibson and Asthana (2011) providing a technical treatment.

7. In parts of the country where fire services are provided by separate fire authorities, counties are initially allocated 9% of revenues.

8. As under the current system, the existing real-terms stock of business rates revenues would continue to be redistributed between councils. Further detail on the proposals can be found in Department for Communities and Local Government (2017a).

9. Published plans are for general grant funding to be abolished, although specific grants for particular services may be kept (DCLG, 2017a).

10. For a list of reliefs see UK Government (2017).

11. Further information is available in Pope and Waters (2016).

12. We do, however make several adjustments to make business rates revenues comparable both across councils and over time. First, councils have scope to offer discretionary reliefs on top of those mandated by the central government, which on average amount to 0.2% of pre-relief revenues. We add back the value of these reliefs so that our revenues capture the underlying revenue capacity. Second, when examining changes in revenues over time, we estimate and strip out the effect of changes to the empty properties relief and small business relief schemes. We do this because under the BRRS, councils are compensated for changes in their business rates income that result from policy changes made by central government. Third, when examining changes in tax revenue capacity, we strip out the estimated effects of the 2010 revaluation of non-domestic properties. We do this so that our analysis captures changes in the underlying quantity and quality of non-domestic property, rather than changes in valuations, which as discussed previously are stripped out of the business rates revenues retained under the BRRS via changes to top-ups and tariffs. Fourth, we strip out the effects of transitional relief, as these are also stripped out from the business rates revenues retained under the BRRS. Full information is available from the authors on request.

13. To do this, we assign each lower-tier council area a share of national tax revenue proportionate to their proportion of the national tax base (which is based on the number of Band-D-equivalent properties). Next, we subtract allocations for fire and police services based on the share of council tax accorded to them in areas where these services are provided by separate authorities. Finally, in two-tier areas we split council tax between tiers in accordance with the average split nationally.

14. We also adjust council tax revenues for a change in the way social transfers are accounted for. Up until 2012–13, the council tax of poor households eligible for support with their council tax bills was paid for by central government. From 2013–14 onwards, councils have had to fund this support from their (increased) grant-funding. This causes a discontinuity in published council tax revenue figures. When comparing revenues over time, we therefore add back in the support councils are paying for with their grant-funding in 2013–14 to make figures consistent with earlier years. Full information is available from the authors on request.

15. Information on the formulae and full set of characteristics used for needs assessment in 2013–14 can be found in Department for Communities and Local Government (2013a). Data and formulae for prior years was provided directly to us by the Department for Communities and Local Government.

16. The p-value for this coefficient is <0.001, and the R2 for the regression is 0.24.

17. Including net commuter flows.

18. The IMD is a multi-dimensional measure of deprivation at a neighbourhood level with domains covering income, employment, health, education, environmental quality and access to amenities and services. The council-level average used here is a weighted average of these neighbourhood-level index values.

19. Indeed, the R2 for a regression of assessed spending need on average IMD score alone is 0.60.

20. The R2 for a regression of tax revenue capacity per capita on GVA per capita alone is 0.88.

21. This is because differences in the level of assessed needs and tax revenue capacity at the start of the scheme can be addressed via the redistributive system of top-ups and tariffs between councils.

22. As discussed previously, the measure of tax revenue capacity used in this sub-section strips out the revenue effects of the 2010 revaluation. We do this because such changes in revenues are stripped out of the BRRS by changes in tariffs and top-ups. Thus stripping out the revaluation provides a measure of the changes in tax revenue capacity per capita that is more relevant for our subsequent analysis.

23. Results available from the authors on request.

24. The p-value of the coefficient on growth in GVA per capita is <0.001 and the R2 for the regression is 0.080.

25. However, as discussed in Amin-Smith and Phillips (2017), if councils retained changes in revenues associated with changes in rateable values at revaluation, there may also be a perverse incentive to restrict development of non-domestic property. This is because rateable values may increase if supply of property is constrained.

26. Further technical details can be found in the Annex below.

27. Information on how we model these scenarios is available in the annex below.

28. Conversely they end up with a growing share or overall business rates revenues, all else equal, if revenues are shrinking in real terms.

References

Amin-Smith, N., Phillips, D., Simpson, P., Eiser, D. and Trickey, M. (2016), 'A time of revolution? British local government finance in the 2010s', IFS Report R121 (https://www.ifs.org.uk/publications/8705)

Amin-Smith, N. and Phillips, D. (2017), 'The business rates revaluation, appeals and local revenue retention', IFS Briefing Note BN193 (https://www.ifs.org.uk/publications/8962)

Baretti, C., Huber, B. and Lichtblau, K. (2002), 'A tax on tax revenue: The incentive effects of equalizing transfers: Evidence from Germany', *International Tax and Public Finance,* Vol. 9, pp 631 – 649

Baskaran, T., Feld. L and Schnellenbach, J. (2016), 'Fiscal Federalism, Decentralization, and Economic Growth: A Meta-Analysis', *Economic Inquiry,* Vol. 54, No.3, pp 1445 – 1463

Baskaran, T., Feld, L. and Necker, S. (2017), 'Depressing Dependence? Transfers and Economic Growth in German States, 1975–2005', *Regional Studies* (forthcoming)

Blöchliger, H (2013), 'Decentralisation and Economic Growth – Part 1: How Fiscal Federalism Affects Long-Term Development', OECD Working Papers on Fiscal Federalism, No. 14 (http://dx.doi.org/10.1787/5k4559gx1q8r-en)

Blöchliger, H and Egert, B. (2013), 'Decentralisation and Economic Growth – Part 2: The Impact on Economic Activity, Productivity and Investment', OECD Working Papers on Fiscal Federalism, No. 15 (http://dx.doi.org/10.1787/5k4559gp7pzw-en)

Blöchliger, H., Merk. O., Charbit, C. and Mizell, L. (2007), 'Fiscal equalisation in OECD countries', OECD Working Papers on Fiscal Federalism, No. 4 (http://dx.doi.org/10.1787/5k97b11n2gxx-en)

Boadway, R. and Shah A. (2009), 'Fiscal Federalism: Principles and Practice of Multiorder Governance', Cambridge University Press, New York

Büttner, T. (2006), 'The incentive effect of fiscal equalization transfers on tax policy', Journal of Public Economics, 2006, vol. 90, no. 3, pp 477 – 497

Department for Communities and Local Government (2017a), '100% business rates retention: further consultation on the design of the reformed system' (https://www.gov.uk/government/consultations/100-business-rates-retention-further-consultation-on-the-design-of-the-reformed-system)

Department for Communities and Local Government (2017b), 'Provisional local government finance settlement 2018 to 2019: statement' (https://www.gov.uk/government/speeches/provisional-local-government-finance-settlement-2018-to-2019-statement)

Fredriksen, K. (2013), 'Decentralisation and Economic Growth – Part 3: Decentralisation, Infrastructure Investment and Educational Performance', OECD Working Papers on Fiscal Federalism, No. 16 (http://dx.doi.org/10.1787/5k4559gg7wlw-en)

Gibson, A. and Asthana, S. (2011), 'Resource allocation for English local government: a critique of the four-block model', *Journal of the Royal Statistical Society, Series A*, 174, 529–46 (https://www.jstor.org/stable/23013509).

Hendry, R. (1998), 'Fair shares for all? The development of needs based funding in education, health and housing', Centre for Analysis of Social Exclusion, CASE/18 (http://eprints.lse.ac.uk/6504/).

OECD (2013), 'Fiscal Federalism 2014: Making Decentralisation Work', OECD Publishing (http://dx.doi.org/10.1787/9789264204577-en)

Pope, T. And Waters, T. (2016), 'A survey of the UK tax system', IFS Briefing Note BN09 (https://www.ifs.org.uk/publications/1711)

Smart, M. (2007), 'Raising taxes through equalization', CESifo Working Paper, No. 1926

UK Government (2017), GOV.UK Business Rates Relief website (https://www.gov.uk/apply-for-business-rate-relief, accessed 27/10/2017)

Data References

Department for Communities and Local Government (2011), English indices of deprivation 2010. https://www.gov.uk/government/statistics/english-indices-of-deprivation-2010 (accessed at 14 March 2017)

Department for Communities and Local Government (2015), English indices of deprivation 2015. https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015 (accessed at 13 March 2017)

Department for Communities and Local Government (2013a), 'Calculation of 2013–14 Formula Funding' (http://webarchive.nationalarchives.gov.uk/20140505104701/http://www.official-documents.gov.uk/document/hc1213/hc09/0948/0948.pdf, accessed 08/11/2017; formulae and data for earlier years provided directly by the Department for Communities and Local Government)

Department for Communities and Local Government (2013b), NNDR3 local authority data: 2006 to 2007 – 2013 to 2014. https://www.gov.uk/government/statistical-data-sets/national-non-domestic-rates-local-authority-level-data (accessed 22 August 2016)

Office of National Statistics (2011), Census 2011, "Rural including hub towns population" and "Total Population". https://www.nomisweb.co.uk/census/2011 (accessed at 12 June 2017)

Office of National Statistics (2013a), Annual Survey of Hours and Earnings – resident analysis, Full Time Workers, Median, Weekly pay – gross. https://www.nomisweb.co.uk/datasets/ashe (accessed at 12 June 2017)

Office of National Statistics (2013b), Annual Survey of Hours and Earnings – workplace analysis, Full Time Workers, Median, Weekly pay – gross. https://www.nomisweb.co.uk/datasets/ashe (accessed at 12 June 2017)

Office of National Statistics (2015a), Population estimates – local authority based by year of age. https://www.nomisweb.co.uk/default.asp (accessed 22 February 2017)

Office of National Statistics (2015b), Annual Population Survey – workplace analysis. https://www.nomisweb.co.uk/datasets/apsnew, (accessed 26 June 2017)

Office of National Statistics (2016), Regional Gross Value Added (Income Approach) by Local Authority in the UK. https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgvaibylocalauthorityintheuk (accessed 12 June 2017)

The Chartered Institute of Public Finance and Accountancy (CIPFA) (2016), Finance and General Estimates: 2006-07 to 2015-16. https://www.cipfastats.net/general/financegeneral/ (accessed 10 April 2017)

Valuation Office Agency (2017), Non-domestic rating: change in rateable value of rating lists, England and Wales, 2017 Revaluation. https://www.gov.uk/government/statistics/non-domestic-rating-change-in-rateable-value-of-rating-lists-england-and-wales-2017-revaluation (accessed at 15 November 2017).

Annex 7.A1

This appendix provides further detail on our modelling of a 100% BRRS.

Setting top-ups and tariffs

As in the 50% BRRS discussed in Section 3, the redistributive top-ups and tariffs are calculated as the difference between a council's *business rates baseline* and its *baseline funding level*.

We calculate a council's business rates baseline by:

- Calculating each council's share of national business rates revenues raised in that council area in 2005–06 and in 2006–07 and taking an average.
- Multiplying this average share by the national total of business rates in 2006–07.
- And then multiplying the resulting figures by the share of business rates allocated to that council (for instance 80% for a shire district and 20% for a county in a two-tier area in our baseline scenario).

This approach is based on that used to calculate business rates baselines when the 50% BRRS was introduced in 2013–14. The reason for taking an average of each council's share of the national business rates total in 2005-06 and 2006-07 is to reduce the extent to which volatility in business rates revenues influences the setting of the top-ups and tariffs.

We calculate each council's baseline funding level by:

- Multiplying its share of national assessed relative spending needs by total national revenues from both business rates and council tax in 2006–07 to derive a cash-terms amount for its assessed spending need.
- And then subtracting from this its council tax revenue capacity in 2006–07.

This tells us the business rates revenues the council would need to meet its assessed spending needs if it set its council tax at the national average level.

Top-ups and tariffs are then calculated as:

top-up (+) or tariff (-) = baseline funding level – business rates baseline

And are then indexed each year by RPI inflation, with the exception of 2010–11 when a further adjustment is made to strip out the effect of the 2010 non-domestic property revaluation.

Adjusting top-ups and tariffs for the 2010 non-domestic property revaluation

Adjustments to the top-ups and tariffs under the 50% BRRS at the time of the 2017 non-domestic property revaluation were made using data on the change in the aggregate value of properties (i.e. the business rates tax base) in each council area as a result of the revaluation.

However, unlike for the 2017 revaluation, such data is not available to use for the 2010 revaluation. We therefore proxy this by the change in the aggregate value of properties in each council area between 2009–10 and 2010–11, which will reflect both changes as a result of the revaluation and changes in the stock of non-domestic property in the council area.

More specifically, we estimate the business rates that would have been raised in a council area in 2010–11 in the absence of the revaluation as:

$$D = A * \left(\frac{B_{2010}/B_{2009}}{C_{2010}/C_{2009}}\right)$$

where:

- A = Actual business rates given the revaluation,
- B_{2010} = National aggregate rateable value in 2010–11,
- B_{2009} = National aggregate rateable value in 2009–10,
- C_{2010} = The council's aggregate rateable value in 2010–11,
- C_{2009} = The council's aggregate rateable value in 2009–10,
- D = Our estimate of business rates revenues in the absence of revaluation,

The adjustment to the council's top-up or tariff to account for revaluation is then calculated as:

$$F = (D - A) * E$$

where:

- E = The share of local business rates assigned to the council,
- F = The revaluation adjustment to the top-up or tariff.

The post-adjustment top-up or tariff is then calculated as:

$$\textit{2010–11 top-up(+) or tariff(-)} = \textit{(2009–10 top-up(+) or tariff(-))} * \left(\frac{RPI_{2010}}{RPI_{2009}}\right) + F$$

where:

- RPI_{2010}= The index-value for RPI in September 2009, used for setting business rates in 2010–11
- RPI_{2009}= The index-value for RPI in September 2008, used for setting business rates in 2009–10

Estimating the extent to which divergence in relative funding ratios are driven by changes in assessed need and changes in tax revenue capacity

We model two scenarios where: (i) councils are compensated for changes in tax revenue capacity, and; (ii) councils are compensated for changes in assessed relative spending needs, so that any divergence in relative funding ratios is the result of changes in tax revenue capacity.

The details of how we model each of these scenarios are as follows:

- Each year, we allocate every council a share of national council tax and business rates revenues equal to its share of national assessed spending needs in 2006–07. Any divergence in relative funding ratios under this scenario is therefore the result of changes in councils' assessed relative spending needs.
- Each year, we re-recalculate every council's baseline funding level to account for changes in its assessed relative spending need (rather than indexing it in line with RPI inflation). There are two steps to this. First we multiply its share of national assessed relative spending needs by total national revenues from both business rates and council tax in that year to derive a cash-terms amount for its assessed spending need. Second, we subtract for this its council tax revenue capacity in 2006–07 indexed by RPI inflation. The latter step ensures baseline funding levels are updated to account for changes in assessed spending ,needs but not changes in council tax revenue capacity. Any divergence in relative funding rations under this scenario is therefore the result of changes in councils' tax revenue capacity.

Chapter 8

Fiscal decentralisation in the Netherlands: Distributional and employment effects

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Fiscal decentralisation is widely advocated as a means to enhance allocative efficiency and accountability at the local level. Moreover, several countries seek to shift taxes from earned income to more "growth-friendly" bases such as immovable property, which is usually levied at the local level. Yet large distributional effects may well impede such tax reforms. In this chapter, we use simulations to explore the distributional effects of a shift from the national earned income tax to either a local tax on the use of residential real estate or a local head tax in the Netherlands. The analysis shows that distributional effects may be reduced considerably by design. Policy scenarios in which distributional effects are minimised, and the tax burden is shifted towards immovable property show that the tax shift yields a moderately positive impact on employment.

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Introduction

The potential advantages of fiscal decentralisation are discussed at length in the economic literature.[1] Ever since Tiebout (1956), the consensus among proponents of fiscal decentralisation is that local taxation brings about more efficient outcomes as it enables and incentivises local governments to tailor expenditures to local demand. Another frequently used argument in favour of decentralising taxes is that it enhances political accountability at the local level since it both confronts voters directly with the costs of the local policy and tightens the local government's budget constraint (see, e.g. Seabright, 1996 and Besley and Coate, 2003).

The Great Recession and the need for fiscal consolidation in its aftermath have spurred the debate on fiscal decentralisation and its potential to enhance budgetary discipline (OECD, 2013). Moreover, the significant tax burden on labour, and its potentially detrimental impact on growth, have led to a search for more "growth-friendly" bases such as immovable property, notably in the European Union (see, e.g. European Commission, 2013). As property taxes are usually levied at the local level, the debate on tax shifting is closely tied to the issue of fiscal decentralisation.

In spite of the potential gains of fiscal decentralisation, distributional effects may inhibit such reforms due to political opposition by the losers. The poll tax failure in the United Kingdom serves as one poignant reminder of the popular resistance that fiscal decentralisation may incite. For such reforms to be successful, it is therefore crucial that distributional effects are understood and addressed. However, the distributional effects of fiscal decentralisation have received little attention in the literature to date.[2]

This chapter explores the distributional effects of a shift from the national earned income tax to either a local tax on the use of residential real estate or a local head tax in the Netherlands. The Netherlands provides a compelling case, as the role of local taxes is exceptionally low from an international perspective – yet this may well change in the near future.[3] In a letter to the Dutch parliament, the Minister of the Interior and Kingdom Relations and the State Secretary for Finance recently outlined a tax shift to the local level (BZK, 2016). Several political parties included a reform along these lines in their manifestos for the 2017 general elections. Using a survey containing detailed information about 95 000 Dutch households as input, a micro-simulation model is applied to predict the distributional effects of a local tax reform along similar lines, which roughly doubles overall local tax revenues. The survey allows us to categorise households into distinct groups on the basis of various characteristics, like income level, source of income and composition.

Two scenarios are considered: one in which the reform takes place through a tax on the use of residential property and another in which a local head tax is introduced. A review of the literature suggests that these two tax bases are particularly conducive to allocative efficiency in the local public sector. These taxes relate more directly to the benefits of local service provision than alternative taxes. Furthermore, they do not divert costs to non-voters, so that local accountability is also enhanced. In both scenarios, higher local taxes are compensated by a lowering of taxes on earned income collected at the national level.[4] Compensation schemes in the baseline scenarios are chosen so as to minimise distributional effects since we are interested in whether large income shifts from one (type of) household to another can be forestalled. This is also the reason why in the baseline simulations exemptions from local taxes are assumed for the lowest-income households.

For both scenarios, we find mild distributional effects for the median households of all household groups considered. In the property tax scenario, these effects range from a -0.3% change in disposable income (for the retired) to a 0.4% change in disposable income (for double earners). Zooming in on individual households, some dispersion around the median is observed, especially at the lower-income levels. Still, less than 5% of the lower-income households experience a negative income shock exceeding 4%, suggesting that the cost of compensating the biggest losers from the reform through more targeted measures may be moderate. Under the head tax scenario, both the distributional effects for the median households and the dispersion around the median are even smaller than in the property tax scenario – a finding that is of particular interest in view of the bad reputation the local head tax has had ever since the poll tax failure. The sensitivity of these results to an alternative treatment of exemptions and fiscal equalisation schemes are explored.

Motivated by the international quest for more growth-friendly tax bases, we also explore the long-term employment effects of our fiscal decentralisation scenarios, using yet a different micro-simulation model. When it comes to the baseline scenarios, in which the compensation scheme is designed to minimise the distributional effects, employment is enhanced under the property tax scenario. The tax shift from earned income to the use of residential real estate increases employment by 0.2% (both in hours and in persons). The simulation results for this scenario thus show that fiscal decentralisation can encourage inclusive growth, since, with few exceptions, the tax shift does not generate large distributional effects for households in the economy while at the same time stimulating employment.

By contrast, a shift to a local head tax does not deliver additional employment if compensation is aimed at minimising income redistribution. Alternative compensation schemes providing households stronger incentives to put in more hours at work (e.g. an increase in the earned income tax credit) create more employment, at the expense of larger distributional effects. Likewise, not granting local tax exemptions has a positive effect on employment but at the same time generates a negative income shock for the lowest-income households.

The next section provides a brief review of the literature on the choice of the local tax base, motivating our choice for a tax on the use of residential real estate and a head tax in the remainder of the chapter. Distributional effects of a shift to these bases are discussed in the third section, while the fourth section deals with the employment effects for the same scenarios that have been considered in the third section. The final section offers some concluding remarks.

Choice of a local tax base: Review of existing insights

Distributional and employment effects of a local tax reform depend crucially on the local tax base through which the reform is channelled. In order to select a tax base that is best able to deliver the potential gains from fiscal decentralisation, we rely on existing insights from the literature. Throughout this chapter, we focus on the financing of local public goods and leave aside the case of social services being funded by local taxes, as is typical for the "Nordic model of fiscal federalism".[5] With this in mind, we consider how various local tax bases perform in terms of two of the main aspects of any local tax reform, namely allocative efficiency and accountability at the local level; these issues will be discussed in turn.

A tax base in accord with the benefit principle?

A common notion in the public finance literature is that taxes that impose the tax burden on those persons who actually benefit from the tax-financed public good are least distortive (see, e.g. Musgrave, 1959). Of course, this benefit principle also holds true for the local public sector. A local tax reform that ensures a better alignment of a person's willingness to pay for local services with the actual amount this person contributes is expected to enhance allocative efficiency. Not only are inhabitants in this way incentivised to weigh the benefits of using public services against the costs, but also local governments are encouraged to deliver those services for which inhabitants are willing to pay.[6]

Even though user fees are a standard way to integrate the benefit principle into local public finance, they obviously cannot be employed to finance non-excludable local public services. In another class of local public services, economies of scale play an important role. Examples include the services from facilities like public transit, theatres, shopping centres and so on. Financing fixed costs from user fees lead to under-utilisation and under-provision of these services, as prices must then be set above the marginal cost.

Taxation of real estate is a way to recoup the benefits of facilities that are produced with fixed costs. By their nature, such facilities will be provided at only a limited number of locations. The benefit that households derive from proximity to such locations will capitalise into land rents. It is a tenet of the conventional urban economic theory that a tax on land rents suffices to finance the efficient level of local public goods provision (Arnott and Stiglitz, 1979). Moreover, the capitalisation of access to urban amenities like theatres, bars and restaurants, shopping centres and cultural heritage turns out to be highly empirically relevant. De Groot et al. (2015) show that in the Netherlands access to such amenities explains at least as much of the spatial variation in house prices as access to jobs. Financing the provision or subsidisation of such amenities from residential real estate means that those who benefit also pay the price.[7]

Property taxes can be levied on either users or owners. Currently, residential property taxes in the Netherlands are only levied on owners. A tax on the use of residential real estate was abolished in 2005. The benefit principle applies when the tax falls on the party thatbenefits. This criterion is non-discriminatory for the owner-occupier sector. It matters considerably, though, for the rental sector. The social rental sector is exceptionally large in the Netherlands, accommodating about one-third of all households. In this sector, capitalisation is imperfect because of rent regulation, so that neither benefits nor taxes on the use of real estate will be fully passed on to owners. Hence, a tax on the use of real estate accords better with the benefit principle than a tax on owners.[8]

Taxation of commercial real estate is only consistent with the benefit principle in as far as commercial activity benefits from local public services. If not, a commercial property tax may induce a race to the bottom in case local jurisdictions engage in aggressive tax-setting behaviour to lure mobile capital. According to the "new view" of property taxation, inter-jurisdictional tax competition renders a (commercial) property tax to be inefficient as it corrodes local tax bases and consequently leads to under-provision of local public services (see Zodrow and Mieszkowski, 1986).[9] Empirical evidence for Germany supports the notion that municipalities may cut tax rates aggressively in order to attract mobile capital (see Becker, Egger and Merlo, 2012).

A head tax accords with the benefit principle for non-excludable public services that benefit all inhabitants to the same extent. Investment in environmental quality is a good example. In this vein, the water boards that are responsible for water management in the Netherlands are also financed with a head tax. While the social services that are provided at the local level are inherently challenging to reconcile with the benefit principle, it may be argued that to some extent, the entire community benefits from their insurance value.[10] Financing such services from a property tax implies that people who live in an expensive dwelling contribute disproportionally to their funding. This may also distort the location choice of households.[11]

Although the demand for municipal services may rise with income, a local income tax may not accord as directly with the benefit principle as a tax on residential real estate. Moreover, whereas residential real estate is immobile in at least the short run, people are not. This implies that to the extent that local income taxes do not correspond to local benefits, they may distort location choices and induce a race to the bottom. The empirical fact that local governments in the United States predominantly choose to tax immobile real estate supports this notion (see, e.g. Nechyba, 1997).

Admittedly, there are quite a few OECD countries, including Switzerland and the Nordic countries, where lower-level governments generate a significant share of their income through income taxes. This does not seem to create excessive inter-jurisdictional tax competition or a malfunctioning of the local public sector.[12] Still, replacing a national tax on earned income by a local income tax does not reduce the tax burden on labour, which makes such a policy less attractive in light of the tax-shifting debate. By contrast, a property tax is expected to put a lower burden on labour as it (partly) capitalises into house prices, leaving labour supply decisions (mostly) unchanged; this issue will be returned to in somewhat more detail in the fourth section of this chapter.

Tax base and accountability

Taxes on the use of real estate and head taxes appear to accord better with the benefit principle than taxes on other bases. By the same token, they also foster the accountability of local governments to their constituents. If people who make use of local services are also confronted with the price, they are incentivised to discipline their local government through the ballot. Yardstick competition plays a vital role in disciplining local governments that want to raise taxes.[13] This competition is reinforced by the high visibility of local property taxes.[14]

Taxation of the ownership rather than the use of residential real estate may undermine accountability, as in the rental sector, such taxes fall on owners that may not vote in the municipality where they own rental dwellings. This creates an incentive to shift costs onto these non-voting parties. Due to rent regulation, taxes on the use of real estate are not fully passed on to outside owners. Moreover, even if such taxes are passed on, then voters are at least confronted with the costs of local public service provision. Modern behavioural economics suggests that such nudges may have considerable effects (see, e.g. Thaler and Sunstein, 2008).

Taxation of other bases appears to be less conducive to democratic accountability. Firms do not have voting rights. Nevertheless, the incentive to overtax firms is mitigated or even undone by the mobility of capital (see the previous section). Local income taxes are less visible than property taxes or head taxes, particularly when they are collected through national income taxation. Hence, we conclude that the tax on the

use of real estate and the head tax are most conducive to efficiency and accountability at the local level.

Distributional effects of fiscal decentralisation

Shifting taxes from one base to another will inevitably make some people worse off. Large distributional effects may hinder a successful tax reform in case it gives rise to public resistance. In order to gain insight on this issue, we explore the distributional effects of fiscal decentralisation in the Netherlands by means of a micro-simulation model.[15] This simulation model, using a representative survey containing detailed information on about 95 000 Dutch households as input, is used by the CPB Netherlands Bureau of Economic Policy Analysis (hereafter, CPB) to perform forecasts and analyses in the realm of purchasing power, social security and (income) taxation.[16]

Using the gross income of individuals as a starting point, the model computes net disposable incomes by adding to, and subtracting from, gross income levels payments and allowances that follow from (income) taxation, social security payments, pension contributions, care and rent benefits, etc. These computations are performed *ceteris paribus*, so the model does not allow for behavioural responses to shocks in disposable income. Moreover, we are able to compute (changes in) net income for various household groups since the survey used allows us to categorise households on the basis of several characteristics, like income level, source of income and composition.

Applying the CPB micro-simulation model, two scenarios for a local tax reform are considered: one in which there is a tax shift from earned income to the use of residential real estate and another in which there is a shift from the earned income tax to a head tax. In both scenarios, the reduction of income taxes at the national level is designed so as to minimise distributional effects. In the property tax scenario, this compensation takes the form of a lowering of the rates in the first two brackets of the income tax.[17] In the head tax scenario, compensation takes place through an increase in the tax credit.

In order to simulate the distributional effects, we make the following assumptions for both scenarios:

- **Assumption 1:** The magnitude of the tax shift is EUR 4 billion.

This shift in taxes would imply that municipal income from local taxes roughly doubles in the Netherlands. On a yearly basis, this would boil down to an increase of local taxes by about EUR 300 per adult or EUR 500 per household, on average. As the share of local income that comes from local taxes would still be less than half of the OECD average of 37%, this shift could be regarded as a conservative first step towards fiscal decentralisation. Moreover, in the property tax scenario, the total revenues from recurrent taxes on residential property would equal approximately EUR 7.5 billion per year or 1.25% of gross domestic product (GDP), which is close to the OECD average (see Blöchliger, 2015).

- **Assumption 2:** Municipalities adjust local taxes in such a way that the level of municipal service provision remains constant.

The simulations abstract from potential efficiency gains that fiscal decentralisation may induce and which would make the distributional picture look more favourable.

- **Assumption 3:** Exemptions from local taxes are granted to households who earn an income (including social security payments) that is below the minimum income threshold.

The share of households with an income below the minimum threshold accounts for about 10% of all households in the Netherlands and mainly consists of unemployed and self-employed people and students.[18] While assuming exemptions in the main scenarios, we will also run alternative scenarios to assess to what extent the lowest-income households are hit if they are not exempted from local taxes.

The next two assumptions only pertain to the scenario in which there is a shift towards a tax on the use of residential real estate.

- **Assumption 4:** The shift from the national tax on earned income to a local property tax takes place through a reduction of the general grants flowing from the central government to the municipalities. This reduction is made according to the equalisation system currently in place.

In the current Dutch equalisation system, disparities in local (residential) property tax base are equalised for 80%. Performing alternative scenarios allows us to determine how different degrees of equalisation affect the distributional effects at the national level.

- **Assumption 5:** Wealth effects for current and future homeowners due to changes in house prices are ignored.

One may expect the property tax to be capitalised into home values, which benefits future homeowners at the expense of current homeowners. However, the distributional effects reported in this section only concern changes in net income and therefore do not reflect changes in a household's wealth.[19]

Simulation results: Property tax scenario

Table 8.1 reports the distributional effects of the property tax scenario. The first column shows the effects of the local tax on household income; the second column shows the effect of the compensating reduction of the national income tax and the third column shows the net effect. The reported percentage change in income holds for the median household for a range of household groups.

Table 8.1. **Distributional effects of the real estate tax appear manageable**

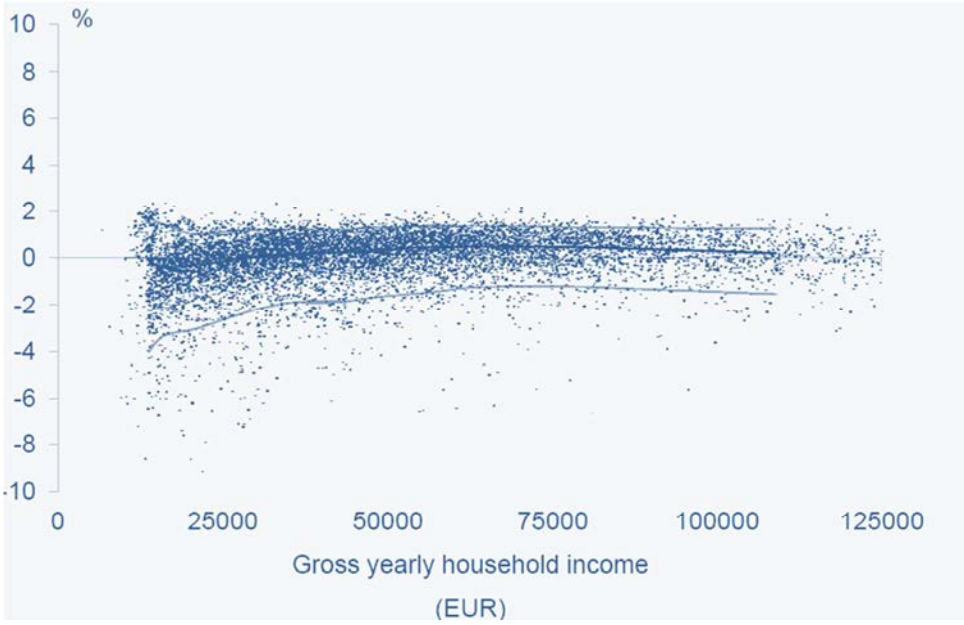
	Property tax	Compensation	Total
Income level			
< 175% minimum wage	-1.7	1.6	-0.1
175-350% minimum wage	-1.5	1.9	0.3
350- 500% minimum wage	-1.2	1.8	0.4
> 500% minimum wage	-1.1	1.2	0.0
Source of income			
Employees	-1.4	1.8	0.3
Unemployed	-1.4	1.3	0.0
Retired	-1.8	1.6	-0.3
Household type			
Double earners	-1.3	1.8	0.4
Singles	-1.7	1.7	-0.0
Single earners	-1.6	1.5	-0.2
Children			
Households with children	-1.3	1.6	0.2
Households without children	-1.4	1.9	0.3
All households	-1.5	1.7	0.1

Note: Figures in this table represent percentage changes relative to household income for the median household in each group.

Source: CPB, 2015.

In none of the household groups, the median household loses more than 0.3% of income, although Figure 8.1 shows that there are some outliers. The property tax induces a comparably significant income loss for the lowest income groups, but these groups also benefit most from the compensating measures. Workers benefit in this scenario, while the retired lose out because the first group spends a smaller share of income on property taxes and it benefits more from the compensating measure. This scenario is also comparably beneficial for two-earner households for essentially the same reasons. Zooming in on individual households in Figure 8.1, some dispersion around the median is observed, especially at the lower-income levels. Still, less than 5% of the lower-income households experience a negative income shock exceeding 4%.

Figure 8.1. **Percentage change in household income against level for property tax scenario**



Note: For each yearly income level, 90% of the percentage changes falls into the two light blue lines.The dark blue line reflects the median.

Source: CPB, 2015.

Annex Table 8.A1.1 shows the distributional effects for an alternative scenario in which the lowest-income households are not exempted from the property tax.[20] As one would expect, the lowest-income group is negatively affected in case no tax exemptions are granted. By contrast, the higher-income households gain somewhat as the elimination of exemptions increases local tax revenues, which in turn allows for a sharper reduction of the tax on earned income.

Two other alternative scenarios show how the distributional effects change when considering different degrees of equalisation of the property tax base. Annex Table 8.A1.2 reports the outcomes in case of full equalisation between municipalities, while Annex Table 8.A1.3 displays the results for the case of only 20% equalisation of property tax capacity. As becomes clear from these two alternative scenarios, the degree of equalisation hardly has any effect on the changes in net income for the different household groups at the aggregate (national) level. Of course, to what extent differences in tax capacity between municipalities are equalised does have implications for disparities in distributional effects between municipalities.

Simulation results: Head tax scenario

Distributional effects of the head tax scenario are reported in Table 8.2. It has the same set-up as Table 8.1. Patterns for the different income groups are also similar: lower incomes incur the most significant loss and receive the most compensation. The distributional effects are even smaller than the effects for the property tax scenario, although Figure 8.2 shows that there are outliers in this scenario as well.

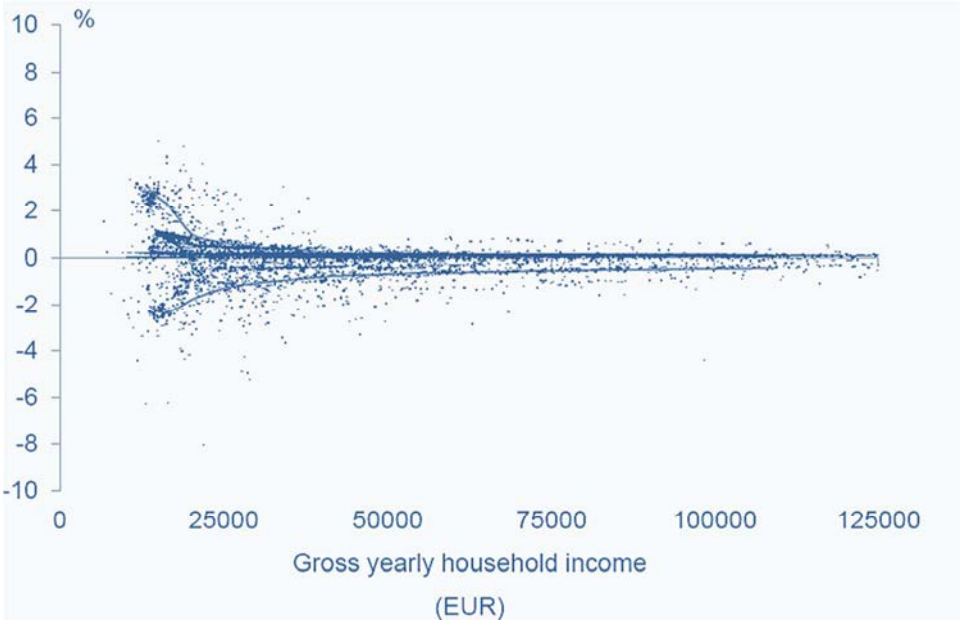
Table 8.2. **Distributional effects of the head tax appear manageable as well**

	Head tax	Compensation	Total
Income level			
< 175% minimum wage	-1.7	1.9	0.1
175-350% minimum wage	-1.6	1.7	0.1
350-500% minimum wage	-1.3	1.4	0.1
> 500% minimum wage	-0.9	1	0.1
Source of income			
Employees	-1.5	1.5	0.1
Unemployed	-1.7	1.2	0.0
Retired	-1.7	1.8	0.2
Household type			
Double earners	-1.6	1.6	0.1
Singles	-1.4	1.5	0.1
Single earners	-1.9	1.9	0.0
Children			
Households with children	-1.4	1.5	0.1
Households without children	-1.5	1.6	0.1
All households	-1.5	1.6	0.1

Note: Figures in this table represent percentage changes relative to household income for the median household in each group.

Source: CPB, 2015.

Figure 8.2. **Percentage change in household income against level for head tax scenario**



Note: For each yearly income level, 90% of the percentage changes falls into the two light blue lines. The dark blue line reflects the median.

Source: CPB, 2015.

Again, we consider an alternative scenario in which there are no local tax exemptions (see Annex Table 8.A1.4). The unemployed lose in this situation, whereas for all other household groups the median household is not worse off than in the baseline scenario. Nevertheless, it appears that in spite of its regressive nature, the

distributional effects of a shift to a head tax may be reduced considerably by the design of the compensation scheme.

Employment effects of fiscal decentralisation

In addition to the distributional effects generated by a shift from a tax on earned income to a property tax or a head tax, we also simulate the employment effects of such a shift using another CPB micro-simulation model. The model we use here is based on a discrete choice model for labour supply, where the structural parameters of the model are estimated by exploiting a large panel dataset that, amongst other things, contains information about labour and leisure decisions for a large sample of Dutch households.[21] The CPB simulation model can be applied to predict how changes in the Dutch tax-benefit system affect the labour market participation decision of various household types.

In order to simulate the employment effects, we make the following assumptions for the property tax scenario (in addition to the assumptions stated in the previous section).

- **Assumption 6:** The tax on the use of residential real estate fully capitalises into house prices.

We believe this assumption is reasonable given that supply on the Dutch occupier-owner housing market is very inelastic, especially in the short and medium term. As a consequence, an increase in housing expenses due to a higher property tax is fully compensated by a fall in house prices and the net housing expenses for (future) occupier-owners are thus unaffected by the tax shift.[22]

- **Assumption 7:** The tax on the use of residential real estate in the rental housing market is not passed on to the landlord.

This assumption follows from the fact that the social rental sector accounts for approximately 90% of the total rental housing stock in the Netherlands and that the social housing sector is characterised by rent regulation. As a result of this regulation, there exists excess demand on this market. This implies that even when net housing expenses for the tenant go up due to the property tax, these expenses will still be below their equilibrium value. Hence, the property tax cannot be passed on to landlords in the form of lower rents.

Simulation results: Property tax scenario

Table 8.3 presents estimates of the long-term employment effects in the property tax scenarios in hours and persons. Due to the assumption that the property tax fully capitalises into house prices because of inelastic supply, the property tax does not distort labour supply. This explains the first column in Table 8.3. As the third column of this table shows, the shift to a property tax stimulates employment. This result is driven by the compensation scheme, as indicated by the second column. This scheme stimulates the participation of the second earner in the household in particular.

Table 8.3. **Employment rises in the property tax scenario**

	Property tax	Compensation	Total
% change in			
Employment in hours	0.0	0.2	0.2
Employment in persons	0.0	0.2	0.2

Source: CPB, 2015.

The alternative scenario in which the lowest-income households are not exempted from local taxes shows a larger positive employment effect (see Annex Table 8.A1.5). Comparing Table 8.3 and Annex Table 8.A1.5 reveals that the additional employment created by not granting exemptions amounts to 0.2 percentage point in hours and 0.1 percentage point in persons. Note, however, that this increase in employment comes at the expense of larger distributional effects, as we have seen in the previous section.

Likewise, employment can be fostered by choosing an alternative compensation scheme. For instance, compensation through the earned income tax credit (EITC) by EUR 4 billion generates an additional increase in employment (in hours and persons) relative to the scenario in Table 8.3. This alternative scenario also shows a trade-off between employment and distributional effects: recipients of income assistance and the retired incur larger income losses in case of compensation through the EITC.

Simulation results: Head tax scenario

The employment effects of the shift to a head tax are shown in Table 8.4. The head tax does not distort labour supply, as shown in the first column. On the other hand, the compensating scheme hardly affects employment either, so that no new jobs are created in this scenario. This is hardly surprising, as both the head tax and the tax credit are essentially lump sum in nature. Like in the property tax scenario, employment effects may be increased by not granting exemptions or through alternative compensation schemes at the expense of more substantial distributional effects, as is shown in Annex Table 8.A1.6.

Table 8.4. **Employment remains constant in the head tax scenario**

	Head tax	Compensation	Total
% change in			
Employment in hours	0.0	0.0	0.0
Employment in persons	-0.0	0.1	0.0

Source: CPB, 2015.

The analysis in this section thus indicates that neither the property tax nor the head tax distorts labour supply. The compensation scheme then determines the extent to which fiscal decentralisation stimulates employment. A shift to the property tax already yields additional jobs in the scenario in which distributional effects are minimised.

Conclusion

In this chapter, it has been argued that the tax on the use of residential real estate and the head tax are conducive to allocative efficiency in the local public sector. Both tax bases accord well with the benefit principle, and they enhance local accountability. Distributional effects of a shift from the national income tax to these tax bases are

manageable through appropriate design of the compensation scheme. Neither scenario distorts labour supply. Finally, fiscal decentralisation may stimulate employment, depending on the compensation scheme.

Light is also cast on the question whether the optimal mix between the property tax and the head tax varies across municipalities. A property tax may be more appropriate if its proceeds are used to invest in location-specific facilities. In municipalities that spend their money mainly on services benefiting all residents equally, a head tax may be more appropriate. Furthermore, in some municipalities, significant discrepancies in home values may exist, which do not directly relate to access to municipal services. In that case, households that happen to live in expensive homes would contribute disproportionally to the provision of local service provision that is financed through a property tax. Setting the mix between these two taxes at the national level would make it impossible for municipalities to respond to such local differences.

Alas, a local tax reform through one of these taxes might not be so easy to implement. As stated by Blöchliger (2015), one of the main strengths of a (local) property tax, namely its visibility, is at the same time one of its weaknesses since voters in general dislike salient taxes. It goes without saying that the same holds for a head tax. On top of that, head taxes and (to a lesser extent) property taxes are in general perceived as unfavourable for low-income households. Public discontent with salient local taxes that generate substantial distributional effects could even lead to tax revolts that leave politicians with no other option than to undo the tax reform.

The most well-known example of a local tax that has been dispensed with due to massive public resistance is the community charge (also known as the poll tax) in the United Kingdom. The community charge was basically a local head tax, introduced in Scotland in 1989 and in England and in Wales one year later. Soon after implementation, the poll tax became very unpopular and was finally abolished in 1992. According to Smith (1991a), an important reason for this unpopularity, besides some ill-thought-out policy measures accompanying the implementation, was that the distributional effects turned out to be unexpectedly large. Moreover, these effects were poorly communicated to the public.

Seen from this perspective, this chapter makes a significant contribution by providing detailed information on the distributional effects of two potential local tax reforms. The scenarios considered differ from the introduction of the poll tax in one crucial aspect. Whereas the poll tax merely replaced another local tax, a shift from the national tax on earned income to a local tax is assumed. Since the national income tax system has many parameters that can be adjusted, these scenarios allow policy makers to design compensation schemes that minimise changes in income distribution. As a result, and in sharp contrast to the experience with the poll tax, distributional effects in both the property tax scenario and the head tax scenario are found to be mild.

Notes

1. See Rodden (2003) and Oates (2005) for comprehensive surveys on the potential merits of fiscal decentralisation. An opposite strand in the literature mentions the potential disadvantages of local taxes and includes works by McLure (1967) and Inman and Rubinfeld (1996).

2. One notable exception is Smith (1991b), who studies the distributional effects of the introduction of the poll tax.

3. The municipalities' income share of local taxes did not exceed 10%, against an OECD average of 37% (OECD/KIPF, 2012).

4. In our simulations, we assume that the national government balances the budget by lowering the grants distributed to the municipalities by the same amount as the reduction in the revenues from earned income taxes. Municipalities in turn balance the budget by increasing local tax revenues such that the loss in revenues from grants is fully compensated.

5. See, e.g. Rattsø (1998) and Borge and Rattsø (2012) for thorough discussions on the Nordic model.

6. This mechanism also underlies the famous Tiebout model, which predicts that interjurisdictional competition and household mobility bring about the efficient provision of local public services (Tiebout, 1956).

7. Of course, not all municipal expenditure will capitalise into house prices. What matters though is whether the marginal services that are financed from local taxes will capitalise. Allers and Vermeulen (2016) show for the Netherlands that changes in central government grants to municipalities that came without spending obligations fully capitalised into house prices. This suggests that at the margin, tax revenues that come without spending obligations will be spent on services that capitalise.

8. Using data on the Boston housing market, Carroll and Yinger (1994) argue that even for the private rental sector a tax on property ownership cannot be considered as a benefit tax. They find that the lion's share of the property tax landlords pay is not shifted to tenants in the form of higher rents, while tenants, rather than landlords, benefit from a higher quality of public services.

9. In principle, the same argument applies to residential real estate. However, it seems empirically less relevant in the Netherlands as the tax base, housing supply, is almost perfectly inelastic in at least the medium long run (Vermeulen and Rouwendal, 2007).

10. Hoynes and Luttmer (2011) decompose the value individuals derive from the US state tax-and-transfer systems into two components: a redistributive value and an insurance value. They show that the latter mitigates the incentive for high-income households to move in order to avoid paying for the redistributive system.

11. Calabrese, Epple and Romano (2012) show that when rich households contribute disproportionally to the provision of the local good, poor households have an

incentive to migrate to wealthy communities with a corresponding abundant supply of local goods and services. Simulations demonstrate that the inefficiencies due to this "rich chasing the poor" mechanism can be such that they fully nullify the potential welfare gains from decentralisation.

12. Schmidheiny (2006) does provide empirical evidence for Switzerland that high incomes sort into low-tax communities. Another empirical paper on fiscal competition between local governments is by Buettner and Janeba (2014), which shows that German municipalities compete for high incomes through subsidies on public theatres. In several Nordic countries, tax competition is stifled by co-ordination amongst municipalities – or even by regulation of tax rates. Notably, for the case of Denmark, Lotz, Blom-Hansen and Hartmann Hede (2015) argue that the Danish local tax system – local income taxation accompanied by financial sanctions for municipalities that raise their tax rate – has created a "tax freeze".

13. A famous paper on yardstick competition between lower-level governments is Besley and Case (1995). It shows that in the case a US state governor is eligible for re-election, the state's tax-setting behavior is influenced by the tax policy of neighbouring states. Allers and Elhorst (2005) provide empirical evidence for the presence of yardstick competition between municipalities in the Netherlands.

14. Cabral and Hoxby (2012) argue that the unpopularity of a property tax is mainly due to its visibility.

15. See Romijn et al. (2008) for a description of this micro-simulation model.

16. The survey used contains household data for the year 2012. For the sake of consistency, for all the other parameters used as input we take their 2012 values.

17. The rate of the first bracket (with a range of EUR 0-18 945) decreases by 1.64 percentage points, while the rate of the second bracket (with a range of EUR 18 945-33 863) falls by 1.19 percentage points.

18. The minimum threshold is determined by the Ministry of Social Affairs and Employment and can be seen as the minimum income one needs to reach a decent standard of living. This threshold is not the same for everyone as it depends on a person's age, marital status, number of children, etc.

19. Using the CPB housing market model (see Donders, Van Dijk and Romijn, 2010), we estimate that house prices will fall by about 1.6% (in the very long run) as a consequence of the shift to property taxes. This wealth effect may be regarded as limited in comparison to house price dynamics in the recent past.

20. All tables and calculations corresponding to the robustness checks are relegated to Annex 8.A1.

21. The model assumes that the labour market clears in the long run, so that an increase in labour supply is met by a rise in labour demand. Therefore, in the remainder we will interpret the outcomes of this model as the effects on employment rather than on labour supply solely. See Jongen, de Boer and Dekker (2014) for a thorough description of this micro-simulation model.

22. Allers and Vermeulen (2016) find that inter-municipal differences in budget shocks fully capitalise into prices on the Dutch housing market, which indicates that supply on this market is highly inelastic.

References

Allers, M.A. and J.P. Elhorst (2005), "Tax mimicking and yardstick competition among local governments in the Netherlands", *International Tax and Public Finance*, Vol. 12, pp. 493-513.

Allers, M.A. and W. Vermeulen (2016), "Capitalization of equalizing grants and the flypaper effect", *Regional Science and Urban Economics* 58, pp. 115-129.

Arnott, R. J. and J. E. Stiglitz (1979), "Aggregate land rents, expenditure on public goods, and optimal city size", *The Quarterly Journal of Economics*, Vol. 93, pp. 471-500.

Becker, S.O., P.H. Egger and V. Merlo (2012), "How low business tax rates attract MNE activity: Municipality-level evidence from Germany", *Journal of Public Economics*, Vol. 96, pp. 698-711.

Besley, T. and A.C. Case (1995), "Incumbent behavior: Vote-seeking, tax-setting, and yardstick competition", *American Economic Review,* Vol. 85.

Besley, T. and S. Coate (2003), "Centralized versus decentralized provision of local public goods: A political economy analysis", *Journal of Public Economics,* Vol. 87.

Blöchliger, H. (2015), "Reforming the tax on immovable property: Taking care of the unloved", *OECD Economics Department Working Papers*, No. 1205, OECD Publishing, Paris, http://dx.doi.org/10.1787/5js30tw0n7kg-en.

Borge, L.-E. and J. Rattsø (2012), "Fiscal federalism: International experiences and the Nordic response", *Rethinking Local Government: Essays on Municipal Reform*, Publications 61, pp. 15-42, Government Institute for Economic Research, Helsinki.

Buettner, T. and E. Janeba (2014), "City competition for the creative class", mimeo.

BZK (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties) (2016), "Hervorming gemeentelijk belastinggebied", 24 June, The Hague.

Cabral, M. and C. Hoxby (2012), "The hated property tax: Salience, tax rates, and tax revolts", *NBER Working Paper*, No. 18514.

Calabrese, S.M., D.N. Epple and R.E. Romano (2012), "Inefficiencies from metropolitan political and fiscal decentralization: Failures of Tiebout competition", *The Review of Economic Studies*, Vol. 79, pp. 1081-1111.

Carroll, R.J. and J. Yinger (1994), "Is the property tax a benefit tax? The case of rental housing", *National Tax Journal*, Vol. 47, pp. 295-316.

CPB (2015), "Een ruimer lokaal belastinggebied", 9 April, The Hague.

Donders, J., M.F. Van Dijk and G. Romijn (2010), "Hervorming van het Nederlandse woonbeleid", *CPB Bijzondere Publicatie* 84, CPB Netherlands Bureau of Economic Policy Analysis, The Hague.

European Commission (2013), *Tax Reforms in EU Member States: Tax Policy Challenges for Economic Growth and Fiscal Sustainability: 2013 Report*, European Commission, Brussels.

De Groot, H.L.F. et al. (2015), *Cities and the Urban Land Premium*, Edward Elgar Publishing, Cheltenham.

Hoynes, H.W. and E.F.P. Luttmer (2011), "The insurance value of state tax-and-transfer programs", *Journal of Public Economics*, Vol. 95, pp. 1466-84.

Inman, R.P. and D.L. Rubinfeld (1996), "Designing tax policy in federalist economies: An overview", *Journal of Public Economics*, Vol. 60, pp. 307-334.

Jongen, E., H.-W. de Boer and P. Dekker (2014), "MICSIM - A behavioural microsimulation model for the analysis of tax-benefit reform in the Netherlands", CPB background document, CPB Netherlands Bureau of Economic Policy Analysis, The Hague.

Lotz J., J. Blom-Hansen and S. Hartmann Hede (2015), "The changing role of local income taxation in Denmark", in *Interaction Between Local Expenditure Responsibilities and Local Tax Policy: Copenhagen Workshop 2013*, Korea Institute of Public Finance and Danish Ministry for Economic Affairs and the Interior, Copenhagen, pp. 231-252.

McClure, C.E. (1967), "The interstate exporting of state and local taxes: Estimates for 1962", *National Tax Journal*, Vol. 20, pp. 49-77.

Musgrave, R.A. (1959), *The Theory of Public Finance: A Study in Public Economy*, McGraw-Hill, New York.

Nechyba, T.J. (1997), "Local property and state income taxes: The role of interjurisdictional competition and collusion", *Journal of Political Economy*, Vol. 105, pp. 351-384.

Oates, W.E. (2005), "Toward a second-generation theory of fiscal federalism", *International Tax and Public Finance* 12, pp. 349-373.

OECD (2013), *Fiscal Federalism 2014: Making Decentralisation Work*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264204577-en.

OECD/KIPF (Korea Institute of Public Finance) (2012), *Institutional and Financial Relations across Levels of Government*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264167001-en.

Rattsø, J. (1998), *Fiscal Federalism and State–local Finance*, Edward Elgar Publishing, Cheltenham.

Rodden, J. (2003), "Reviving Leviathan: Fiscal federalism and the growth of government", *International Organization* 57, pp. 695-729.

Romijn, G. et al. (2008), "MIMOSI: Microsimulatiemodel voor belastingen, sociale zekerheid, loonkosten en koopkracht", CPB Document 161, CPB Netherlands Bureau of Economic Policy Analysis, The Hague.

Schmidheiny, K. (2006), "Income segregation and local progressive taxation: Empirical evidence from Switzerland", *Journal of Public Economics*, Vol. 90, pp. 429-458.

Seabright, P. (1996), "Accountability and decentralization in government: An incomplete contracts model", *European Economic Review*, Vol. 40, pp. 61-89.

Smith, P. (1991a), "Lessons from the British poll tax disaster", *National Tax Journal*, Vol. 44, pp. 421-436.

Smith, S. (1991b), "Distributional issues in local taxation", *The Economic Journal*, Vol. 101, pp. 585-599.

Tiebout, C.M. (1956),"A pure theory of local expenditures", ***Journal*** *of Political Economy,* Vol. 64, No. 5, pp. 416-424.

Thaler, R.H. and C.R. Sunstein (2008), *Nudge*, Yale University Press.

Vermeulen, W. and J. Rouwendal (2007), "Housing supply in the Netherlands", *CPB Discussion Paper* 87, CPB Netherlands Bureau of Economic Policy Analysis, The Hague.

Zodrow, G. and P. Mieszkowski (1986), "Pigou, Tiebout, property taxation, and the underprovision of local public goods", *Journal of Urban Economics*, Vol. 19, No. 3, pp. 356-370.

Annex 8.A1

Robustness analysis

Table 8.A1.1. **Distributional effects of the property tax in case no local tax exemptions are granted**

	Property tax	Compensation	Total
Income level			
< 175% minimum wage	-2.0 (-1.7)	1.8 (1.6)	-0.5 (-0.1)
175-350% minimum wage	-1.5 (-1.5)	2.0 (1.9)	0.4 (0.3)
350-500% minimum wage	-1.2 (-1.2)	1.9 (1.8)	0.6 (0.4)
> 500% minimum wage	-1.1 (-1.1)	1.3 (1.2)	0.1 (0.0)
Source of income			
Employees	-1.4 (-1.4)	2.0 (1.8)	0.4 (0.3)
Unemployed	-2.0 (-1.4)	1.4 (1.3)	-0.8 (0.0)
Retired	-1.9 (-1.8)	1.7 (1.6)	-0.3 (-0.3)
Household type			
Double earners	-1.3 (-1.3)	1.9 (1.8)	0.5 (0.4)
Singles	-1.9 (-1.7)	1.9 (1.7)	-0.2 (-0.0)
Single earners	-1.6 (-1.6)	1.6 (1.5)	-0.1 (-0.2)
Children			
Households with children	-1.4 (-1.3)	1.8 (1.6)	0.3 (0.2)
Households without children	-1.5 (-1.4)	2.0 (1.9)	0.4 (0.3)
All households	-1.6 (-1.5)	1.9 (1.7)	0.2 (0.1)

Note: Figures in this table represent percentage changes relative to household income for the median household in each group. Results for the baseline scenario are in parentheses.

Source: CPB, 2015.

Table 8.A1.2. **Distributional effects of the property tax in case of full equalisation of tax capacity**

	Property tax	Compensation	Total
Income level			
< 175% minimum wage	-1.6 (-1.7)	1.5 (1.6)	-0.1 (-0.1)
175- 350% minimum wage	-1.4 (-1.5)	1.8 (1.9)	0.3 (0.3)
350- 500% minimum wage	-1.2 (-1.2)	1.7 (1.8)	0.4 (0.4)
> 500% minimum wage	-1.1 (-1.1)	1.2 (1.2)	0.0 (0.0)
Source of income			
Employees	-1.3 (-1.4)	1.7 (1.8)	0.3 (0.3)
Unemployed	-1.3 (-1.4)	1.2 (1.3)	0.0 (0.0)
Retired	-1.7 (-1.8)	1.5 (1.6)	-0.3 (-0.3)
Household type			
Double earners	-1.2 (-1.3)	1.7 (1.8)	0.4 (0.4)
Singles	-1.6 (-1.7)	1.6 (1.7)	0.0 (-0.0)
Single earners	-1.5 (-1.6)	1.4 (1.5)	-0.2 (-0.2)
Children			
Households with children	-1.2 (-1.3)	1.5 (1.6)	0.2 (0.2)
Households without children	-1.3 (-1.4)	1.8 (1.9)	0.3 (0.3)
All households	-1.4 (-1.5)	1.6 (1.7)	0.1 (0.1)

Note: Figures in this table represent percentage changes relative to household income for the median household in each group. Results for the baseline scenario are in parentheses.

Source: CPB, 2015.

Table 8.A1.3. **Distributional effects of the property tax in case of 20% equalisation of tax capacity**

	Property tax	Compensation	Total
Income level			
< 175% minimum wage	-1.8 (-1.7)	1.6 (1.6)	-0.2 (-0.1)
175- 350% minimum wage	-1.5 (-1.5)	1.9 (1.9)	0.2 (0.3)
350- 500% minimum wage	-1.3 (-1.2)	1.7 (1.8)	0.4 (0.4)
> 500% minimum wage	-1.1 (-1.1)	1.2 (1.2)	0.0 (0.0)
Source of income			
Employees	-1.4 (-1.4)	1.8 (1.8)	0.3 (0.3)
Unemployed	-1.5 (-1.4)	1.3 (1.3)	-0.0 (0.0)
Retired	-1.9 (-1.8)	1.6 (1.6)	-0.4 (-0.3)
Household type			
Double earners	-1.4 (-1.3)	1.8 (1.8)	0.3 (0.4)
Singles	-1.8 (-1.7)	1.7 (1.7)	-0.1 (-0.0)
Single earners	-1.6 (-1.6)	1.5 (1.5)	-0.2 (-0.2)
Children			
Households with children	-1.3 (-1.3)	1.6 (1.6)	0.1 (0.2)
Households without children	-1.5 (-1.4)	1.9 (1.9)	0.2 (0.3)
All households	-1.5 (-1.5)	1.7 (1.7)	0.1 (0.1)

Note: Figures in this table represent percentage changes relative to household income for the median household in each group. Results for the baseline scenario are in parentheses.

Source: CPB, 2015.

Table 8.A1.4. **Distributional effects of the head tax in case no local tax exemptions are granted**

	Head tax	Compensation	Total
Income level			
< 175% minimum wage	-1.9 (-1.7)	2.1 (1.9)	0.3 (0.1)
175- 350% minimum wage	-1.6 (-1.6)	1.8 (1.7)	0.2 (0.1)
350- 500% minimum wage	-1.3 (-1.3)	1.5 (1.4)	0.2 (0.1)
> 500% minimum wage	-0.9 (-0.9)	1.1 (1.0)	0.1 (0.1)
Source of income			
Employees	-1.5 (-1.5)	1.7 (1.5)	0.2 (0.1)
Unemployed	-2.1 (-1.7)	1.4 (1.2)	-0.5 (0.0)
Retired	-1.8 (-1.7)	2.0 (1.8)	0.3 (0.2)
Household type			
Double earners	-1.6 (-1.6)	1.7 (1.6)	0.2 (0.1)
Singles	-1.6 (-1.4)	1.7 (1.5)	0.2 (0.1)
Single earners	-2.0 (-1.9)	2.1 (1.9)	0.2 (0.0)
Children			
Households with children	-1.5 (-1.4)	1.6 (1.5)	0.2 (0.1)
Households without children	-1.6 (-1.5)	1.7 (1.6)	0.2 (0.1)
All households	-1.6 (-1.5)	1.7 (1.6)	0.2 (0.1)

Note: Figures in this table represent percentage changes relative to household income for the median household in each group. Results for the baseline scenario are in parentheses.

Source: CPB, 2015.

Table 8.A1.5. **Employment in the property tax scenario in case no local tax exemptions are granted**

	Property tax	Compensation	Total
% change in			
Employment in hours	0.2 (0.0)	0.2	0.4 (0.2)
Employment in persons	0.1 (0.0)	0.2	0.3 (0.2)

Note: Results for the baseline scenario are in parentheses.

Source: CPB, 2015.

Table 8.A1.6. **Employment in the head tax scenario in case no local tax exemptions are granted**

	Head tax	Compensation	Total
% change in			
Employment in hours	0.3 (0.0)	0.0	0.3 (0.0)
Employment in persons	0.2 (-0.0)	0.1	0.3 (0.0)

Note: Results for the baseline scenario are in parentheses.

Source: CPB, 2015.

Chapter 9

Fiscal decentralisation and the efficiency of public service delivery

by

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This chapter explores the impact of fiscal decentralisation on the efficiency of public service delivery. It uses a stochastic frontier method to estimate time-varying efficiency coefficients and analyses the impact of fiscal decentralisation on those efficiency coefficients. The findings indicate that fiscal decentralisation can improve the efficiency of public service delivery but only under specific conditions. First, the decentralisation process requires adequate political and institutional environments. Second, a sufficient degree of expenditure decentralisation seems necessary to obtain favourable outcomes. Third, decentralisation of expenditure needs to be accompanied by sufficient decentralisation of revenue. Absent these conditions, fiscal decentralisation can worsen the efficiency of public service delivery.

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Introduction

This chapter analyses the impacts of fiscal decentralisation on the efficiency of public service delivery. It contributes to existing studies by focusing explicitly on the efficiency of public service delivery instead of the policy outcome. The policy outcome can be improved by augmenting policy inputs (for instance, spending allocation); in contrast, efficiency is measured as the difference in policy outcomes — across countries and over time — under a similar set of policy inputs. This chapter also covers a large sample of countries, including developed, emerging and developing economies.[1] Last, it uses recent empirical techniques to reach the findings and ascertain their robustness.

The chapter's findings suggest that fiscal decentralisation can serve as a policy tool to improve performance, but only under specific conditions. Our findings focus on the efficiency of spending on education and health and indicate that an adequate institutional environment is needed for decentralisation to improve public service delivery. Such conditions include effective autonomy of local governments, strong accountability at various levels of institutions, good governance, and strong capacity at the local level. Moreover, a sufficient degree of expenditure decentralisation seems necessary to obtain a positive outcome. And finally, decentralisation of expenditure needs to be accompanied by sufficient decentralisation of revenue to obtain favourable outcomes. Absent these conditions, fiscal decentralisation can worsen the efficiency of public service delivery.

The paper is structured as follows. The next section reviews the existing literature and summarises the merits and risks of fiscal decentralisation. The third section presents the empirical analysis. The final section concludes with the main policy recommendations.

Literature review and theoretical background

Fiscal decentralisation can improve the efficiency of public service delivery through preference matching and allocative efficiency. Local governments possess better access to local preferences and, consequently, have an informational advantage over the central government in deciding which provision of goods and services would best satisfy citizens' needs (Hayek, 1945; Tiebout, 1956; Musgrave, 1969). When provided by the jurisdiction that has the control over the minimum geographic area, costs and benefits of public services are fully internalised, which is expected to improve allocative efficiency (Oates, 1972).

Fiscal decentralisation can also ameliorate efficiencies by fostering stronger accountability. Geographical closeness of public institutions to the local population (final beneficiaries) fosters accountability and can improve public service outcomes, particularly in sectors such as education and health (Ahmad, Brosio, and Tanzi, 2008; Cantarero and Sanchez, 2006). Local accountability is expected to put pressure on local authorities to continuously search for ways to produce and deliver better public services under limited resources, leading to "productive efficiency". Accountability can foster larger spending in public investment and other growth-enhancing sectors, such as education and health (Keen and Marchand, 1997; Arze del Granado, Martinez-Vazquez and McNab, 2005; Bénassy-Quéré, Gobalraja and Trannoy, 2007; Kappeler and Valila, 2008; Fredriksen, 2013). Local accountability can be strengthened through a direct election of local authorities by the local population.

Furthermore, fiscal decentralisation can improve efficiency through the "voting with one's feet" hypothesis. Decentralisation gives voters more electoral control over authorities (Seabright, 1996; Persson and Tabellini, 2000; Hindriks and Lockwood, 2005). It encourages competition across local governments to improve public services; voters can use the performance of neighbouring governments to make inferences about the competence or benevolence of their own local politicians (Bordignon, Cerniglia and Revelli, 2004). Fiscal decentralisation may lead to a decrease in lobbying by interest groups, distorting policy choices and increasing waste of public funds.

However, fiscal decentralisation can worsen public service delivery if economies of scale are important. Devolution of public service delivery to a small-scale local government can decrease efficiency and increase costs if economies of scale are important in the process of production and provision of some specific public goods. For instance, shifting the production and provision of public services to a municipality with a small number of government officials (producers and providers) and a small population (beneficiaries) can reduce efficiency.

Fiscal decentralisation can also obstruct the redistribution role of the central government. To guarantee a minimum level of public services and cater to basic needs (or standard of living) for the entire population (regardless of their geographical location), the central government often carries out equalisation transfers, which would be disrupted in cases of insufficient leverage over resources (Ter-Minassian, 1997). When a significant share of revenue and expenditure is shifted to local governments, the central government does not possess sufficient resources to reduce large income differences across the regions of a country.

Fiscal decentralisation can also hinder public service delivery if accountability is loose. If accountability is not broadly anchored in a local democratic process, but instead is based on rent-seeking political behaviour, local governments would be tempted to allocate higher decentralised expenditure to non-productive expenditure items (such as wages and goods and services instead of capital expenditure). This can hinder efficiency, economic growth, and overall macroeconomic performance (Davoodi and Zou, 1998; Phillips and Woller, 1998; Zhang and Zou, 1998; Ezcurra and Rodriguez-Pose, 2010; Gonzalez-Alegre, 2010; Grisorio and Prota, 2011).

Empirical analysis

Methodology

This chapter investigates the efficiency, rather than just the outcome, of public service delivery in health and education. Policy outcome is the directly measurable impact of public service delivery; outcome indicators can include infant mortality rates and school enrolment rates. Policy outcomes can be improved by augmenting policy inputs, such as expenditure allocation for health and education. However, the efficiency analysis focuses on the improvement in outcome while keeping inputs unchanged.2 This approach allows us to analyse the impact of policies other than inputs in improving the provision of public goods and services; such policies can include fiscal decentralisation.

The methodology is based on a two-step approach, estimating efficiency coefficients and analysing the impact of fiscal decentralisation on the latter. In a first step, the efficiency of public service delivery is estimated using stochastic frontier techniques. These techniques provide time-varying coefficients that measure the

distance of the public services in a specific country at a specific year to the best public services provided using similar inputs in the sample of countries considered in this analysis. In a second step, the effects of fiscal decentralisation on the estimated efficiencies are estimated. Instrumental variable methods are used to obtain bias-corrected coefficients. These methods address concerns about endogeneity associated with the decentralisation process; they can also tackle reverse causality that could plague the estimated parameters.

In a first step, efficiency coefficients are estimated from stochastic frontier techniques. Methodologies on efficiency estimates can be grouped into two main approaches: 1) a parametric approach (Battese and Coelli, 1988; Jayasuriya and Wodon, 2003; Grigoli and Kapsoli, 2013); and 2) a non-parametric approach (Gupta and Verhoeven, 2001; Herrera and Pang, 2005; Gupta et al., 2007). This chapter uses the parametric approach-based stochastic frontier analysis (SFA). The SFA allows for estimating models with multiple inputs, as opposed to non-parametric models that do not take into account the effect of exogenous factors on the outcome variable because of the restriction on the number of variables. As the outcome variables in this chapter, that is, infant mortality and enrolment ratio, are plausibly affected by structural factors other than public expenditure, such as socio-economic characteristics of the country, a multivariable model is better suited for the analysis. Moreover, the SFA allows us to estimate country-specific and time-varying coefficients.

The SFA techniques assume that no economic agent (i.e. country) can exceed the ideal "frontier." The frontier refers to the optimum output — infant mortality rate or enrolment rate — produced with limited inputs, such as public expenditure. The deviation of the output in a specific country at a specific time from this frontier represents the individual measure of the efficiency of that country. Efficient governments are those operating at, or very close to, the frontier as they try to reduce the infant mortality rate or improve the enrolment rate, given a limited amount of public expenditure.

The first-step model is specified as follows:

$$Y_{it} = \alpha + \gamma PE_{it-1} + \sum_{k=1}^{K} \varphi_k Z_{k,it-1} + \varepsilon_{it} \quad (1)$$

$$\begin{cases} \varepsilon_{it} = \omega_{it} \pm \eta_{it} \\ \eta_{it} = g(t)\, g\, \eta_i \quad and\ g(t) = \exp[-\lambda(t - T_i)] \end{cases} \quad (2)$$

The dependent variable Y_{it} in equation (1) represents public expenditure outcomes in health and education, namely the infant mortality rate and the secondary school enrolment rate, with subscripts i and t denoting respectively country and time dimensions. The interest variable PE_{it-1} corresponds to public expenditure on health and education as a percentage of gross domestic product (GDP). A set of control variables $Z_{k,it}$ are added, which are likely to influence the infant mortality rate or the enrolment rate. The error term ε_{it} in equation (1) has two components as shown in equation (2); ω_{it} represents an idiosyncratic disturbance, capturing measurement error or any other classical noise, and the remaining part η_{it} is a one-sided disturbance capturing the country-specific and time-varying efficiency of public expenditure.[3] Equations (1) and (2) allow us to obtain the country-specific and time-varying efficiency of public expenditure, following the formula provided by Battese and Coelli (1988) and Jondrow et al. (1988).

The second step consists of measuring the extent to which fiscal decentralisation affects the estimated efficiencies. The impact of fiscal decentralisation is analysed through a direct channel, a non-linear relationship, and interactions with political and institutional variables. The baseline model is the following:

$$\hat{\eta}_{it} = \alpha + \delta fd_{it-1} + \varphi GDP_{it-1} + \psi_{it} \quad (3)$$

The dependent variable $\hat{\eta}_{it}$ is the country-specific and time-varying efficiency estimated from equations (1) and (2), α is a common constant term, and fd_{it-1} measures fiscal decentralisation.

To explore non-linearities in the relationship between fiscal decentralisation and public expenditure efficiency, a quadratic specification is added—i.e. squared fiscal decentralisation

$\left(fd_{it-1} \right)^2$ — as shown in equation (4). Non-linearities, if any, are detected by computing the derivatives:

$$\hat{\eta}_{it} = \alpha + \delta_1 fd_{it-1} + \delta_2 (fd_{it-1})^2 + \varphi GDP_{it-1} + \psi_{it} \quad (4)$$

Furthermore, the impact of the political and institutional environment on the relationship between decentralisation and the efficiency of public service delivery is investigated. Political and institutional variables are introduced additively (I_{it-1}) but also in interaction with fiscal decentralisation $\left(fd_{it-1} \times I_{it-1} \right)$, as shown in equation (5).

$$\hat{\eta}_{it} = \alpha + \delta fd_{it-1} + \tau (fd_{it-1} \times I_{it-1}) + \rho I_{it-1} + \varphi GDP_{it-1} + \psi_{it} \quad (5)$$

Parameter ρ corresponds to the direct effect of political and institutional variables on efficiency. Parameters δ and τ correspond respectively to the effect of fiscal decentralisation on the efficiency and the influence of the political and institutional environments on the causal link between fiscal decentralisation and public service efficiency. ψ_{it} in equations (3) – (5) is a composite error term, taking into account country-specific characteristics.

Fiscal decentralisation is measured as the share of sub-national fiscal variables over general government fiscal variables.[4] The main estimates in this chapter are based on the expenditure side of fiscal decentralisation, using the share of sub-national expenditure to general government expenditure.[5] The primary focus is on expenditure as it is directly linked to health and education outcomes and efficiency (as opposed to revenue). However, to ensure a comprehensive study, the chapter also analyses the impacts of revenue decentralisation on the efficiency of public service delivery, using the share of local government revenue to general government revenue.[6] The political and institutional variables focus on the level of corruption, the degree of autonomy of the regions, the strength of the democracy, and the constitutional regime (presidential or parliamentary). Control variables in the stochastic frontier analysis comprise real GDP per capita as a measure of the level of development, the density and population size, and the average years of primary and secondary schooling. All these variables are considered to influence the infant mortality rate and the secondary school enrolment

rate.[7] It would be insightful to use the share of sub-national expenditure on health and education to general government expenditure in each of the two sectors; however, such data are not available for many of the countries in the sample. Furthermore, the efficiency is influenced by factors beyond expenditure, and analysis using aggregate expenditure ratio allows for more precise comparison with the analysis using aggregate revenue ratio.

Endogeneity and causality concerns are addressed through lag and instrument techniques that motivate the introduction of additional variables. An initial attempt at reducing any bias consists of introducing all explanatory variables, including fiscal decentralisation, with a one-period lag. Furthermore, two-stage least squares techniques are applied for the fiscal decentralisation variable, using three instrumental variables. First, the population size is considered a significant variable affecting the decentralisation process because larger countries generally tend to be more decentralised despite some counter examples (Dziobek, Gutierrez-Mangas and Kufa, 2011; Jiménez-Rubio, 2011; Escolano et al., 2012). The rationale is that in countries with large populations, it is more difficult for central authorities to have sufficient information to target citizens' needs, which leads to decentralisation. Second, the existence of natural resources can act as an obstacle to decentralisation, because of possible rent-seeking of fiscal authorities that benefit directly from the resource windfalls. Under such circumstances, embarking on a fiscal decentralisation process would imply a subsequent private loss for incumbent authorities. On the other hand, residents of resource-rich regions can claim larger shares of resources through accelerated decentralisation. Moreover, natural resources might be seen as a blessing, triggering the decentralisation process because windfalls may constitute an additional source of revenue to share with the sub-national governments. Third, government fractionalisation in the legislative system can affect the decentralisation process. Fractionalisation is measured as the probability that two deputies randomly picked either from the government, or the legislature will be from different parties. Higher fractionalisation may either act against the decentralisation process, owing to political motives, or accelerate decentralisation. The expected signs of these two last instrumental variables on the decentralisation process cannot be determined *a priori*.

Data

The sample covers an unbalanced panel of 64 countries, including advanced, emerging and developing economies, during 1990–2012. Data are taken from various sources, including the International Monetary Fund's (IMF) *Governments Financial Statistics*, the World Bank's *World Development Indicators*, Eurostat, and OECD databases, among others. Annexes 9.A1 and 9.A2 present the full sample, variable definitions, and sources.

Fiscal decentralisation is more extensive in advanced economies than in emerging economies and developing countries, but it has accelerated in the latter two groups in recent decades. Table 9.1 and Figure 9.1 provide descriptive statistics of the main variables used in this analysis. On average, about 30% of public expenditure is implemented by sub-national governments. This share is about 40% for advanced economies compared to about 25% for emerging economies and developing countries. On the revenue side, the share of sub-national governments is about 27%; 37% in advanced economies; and 23% in emerging economies and developing countries. The legislative system appears to be much more fractionalised than the government. The probability that two deputies come from two different parties is 65%, whereas it is only

29% for members of governments. A higher corruption index indicates a more corrupt system; corruption seems more pervasive in emerging economies and developing countries. The political system index is a binary variable, taking a value of one for parliamentary regimes and zero for presidential regimes; advanced economies appear more parliamentary based than emerging economies and developing economies. A higher democracy score indicates a higher degree of democracy. The "autonomy" indicator is a dummy variable taking the value of one when constitutionally autonomous regions exist in the country.

Table 9.1. **Descriptive statistics**

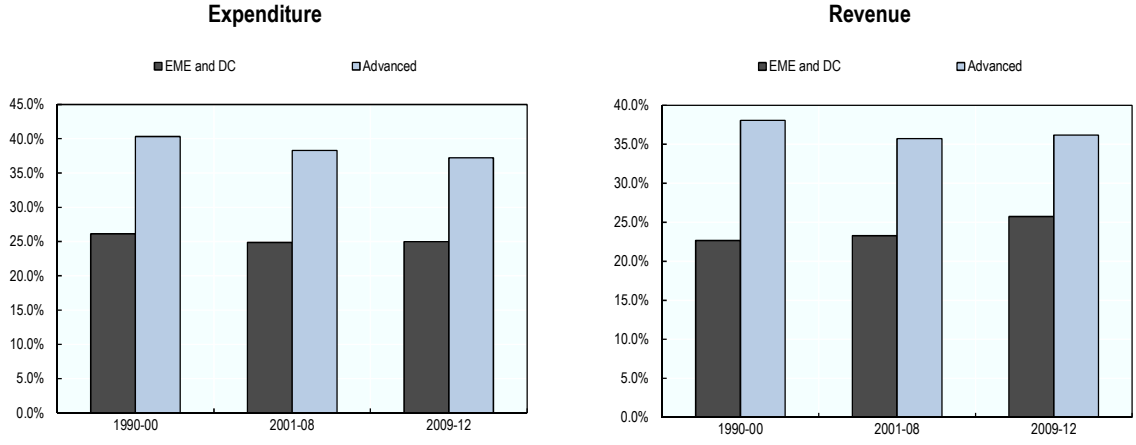
		Mean					
Variables	observations	All	Advanced	EME and DC	Standard deviation	Min.	Max.
FD expenditure (%)	1 086	29.6	39.0	25.4	21.3	0.0	98.4
FD revenue (%)	1 129	27.4	36.8	23.5	20.0	0.0	73.6
Real GDP per capita (in thousands)	1 467	22.7	34.7	17.6	15.7	1.3	97.4
Natural resources (% GDP)	1 467	4.5	1.9	5.7	8.1	0.0	64.0
Government fractionalisation	1 381	0.3	0.3	0.3	0.3	0.0	1.0
Fractionalisation	1 361	0.7	0.7	0.6	0.2	0.0	1.0
Population size (in millions)	1 472	48.6	43.3	50.9	138.7	0.1	1 236.7
Corruption	1 280	-2.7	-3.5	-2.3	1.3	-5.0	0.7
Parliamentary	1 433	0.6	0.9	0.4	0.5	0.0	1.0
Democracy	1 425	30.1	51.0	20.9	26.4	1.0	82.0
Autonomy	1 427	0.2	0.3	0.2	0.4	0.0	1.0

Note: EME = Emerging market economies; DC = Developing countries; FD = Fiscal decentralisation

Source: Authors' calculations.

Figure 9.1. **Share of sub-national government expenditure/revenue**

Percent of general government expenditure/revenue



Source: Authors' calculations.

Efficiency estimates

The average efficiency of the countries in the sample is at about 85% of the production frontier. The predicted efficiencies from the stochastic frontier analysis are about 82.2% on average for health and 87.8% for education (Table 9.2). An efficiency score of *x* percent implies that the country delivers *x* percent of the possible objective

(*reducing infant mortality rate or increasing school enrolment rate*) as compared to a fully efficient country using similar input values (such as public expenditure). The benchmark efficiency estimates — columns (1) and (4) in Table 9.2 — are based on the approach proposed by Battese and Coelli (1988). To check the robustness of the findings, two other methodologies are applied. Efficiency estimates based on Jondrow et al. (1982) are presented in columns (2) and (5); and the estimates that take into account heterogeneity and heteroskedasticity are shown in columns (3) and (6). The estimates from those various approaches are highly correlated.

Table 9.2. **Stochastic frontier estimates of public service efficiency**

	Estimated efficiencies					
	Health			Education		
	Battese and Coelli (1988)	Jondrow et al. (1982)	Heterog	Battese and Coelli (1988)	Jondrow et al. (1982)	Heterog
Statistics	(1)	(2)	(3)	(4)	(5)	(6)
Mean of efficiencies	0.82	0.81	0.84	0.88	0.88	0.88
Standard deviation	0.09	0.10	0.11	0.10	0.10	0.13
Minimum	0.30	0.29	0.31	0.33	0.33	0.27
Maximum	0.94	0.94	0.98	0.98	0.98	0.99

Note: Columns 1 and 4 use the Battese and Coelli (1988) method to estimate the efficiency score, while columns 2 and 5 draw upon the alternative Jondrow et al. (1982) methodology. We allow for heterogeneity and heteroscedasticity while estimating the efficiency scores in columns 3 and 6.

Source: Authors' calculations.

Direct channel and non-linear relationship

Through a direct channel, expenditure decentralisation seems to improve the efficiency of public service delivery in advanced economies but has a negative impact on emerging economies and developing countries. Estimating equation (3), the first step of the two-stage least squares points to the appropriateness of the instrument variables. The latter is significantly correlated with the endogenous regressor in almost all cases (the associated p-values are < 0.05). Besides, using the Kleibergen-Paap p values, the null hypothesis that "the equations are under-identified" can be rejected at the 5% level. The results of the second step are presented in Table 9.3. Pooling the advanced economies, emerging markets, and developing economies, it appears that fiscal decentralisation has no significant effect on the efficiency of public expenditure (Columns 1 and 6). Considering that the various countries exhibit dissimilar levels of decentralisation (as shown in the previous section), the sample is divided into two groups: 1) advanced economies; and 2) emerging markets and developing economies.[8] For advanced economies, fiscal decentralisation shows positive impacts on the efficiency of public expenditure on health (Column 2). To quantify this effect, one could say that a 5% increase in fiscal decentralisation would lead to 2.9 percentage point efficiency gain in public service delivery. The coefficient is statistically insignificant for education (Column 7). In contrast, for emerging markets and developing economies, the impacts are negative (Columns 3 and 8). These positive and negative effects of decentralisation, respectively for the first and second group of countries, are robust to the inclusion of time dummies, albeit with a slight reduction in the magnitude of the parameters (Columns 4, 5, 9 and 10). This seems to confirm that the results are not driven by common shocks hitting all countries at the same time, nor by a time-trend evolution of the efficiency scores.

Table 9.3. **Fiscal decentralisation and public expenditure efficiency**

	Dependent variable: Estimated efficiencies									
	Health					Education				
	All	Advanced	EME and DC	Time dummies		All	Advanced	EME and DC	Time dummies	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$FD_{(t-1)}$	0.109	0.599***	-0.322***	0.433***	-0.187***	0.0373	-0.0453	-0.872**	0.800***	-0.616**
	(0.925)	(7.956)	(-2.919)	(5.211)	(-2.737)	(0.126)	(-0.339)	(-2.545)	(3.674)	(-2.305)
Real GDP pc(t-1)	0.035***	0.008	0.023***	-0.061***	-0.093***	-0.020**	-0.077***	-0.007	0.044	-0.070**
	(5.402)	(0.778)	(2.730)	(-3.286)	(-6.865)	(-2.200)	(-4.339)	(-0.386)	(1.284)	(-2.564)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	875	269	606	269	606	690	213	477	213	477
Countries	55	14	41	14	41	53	14	39	14	39
Fisher (*p-value*)	0.000	0.000	0.000	0.000	0.000	0.056	0.000	0.041	0.000	0.249
Hansen OID (*p-value*)	0.000	0.008	0.000	0.000	0.007	0.000	0.000	0.004	0.042	0.000
KP-under	0.000	0.000	0.000	0.000	0.000	0.057	0.002	0.048	0.013	0.034
$FD_{(t-1)}$ instrumentation (*p-value*)	0.000	0.000	0.000	0.000	0.000	0.052	0.000	0.029	0.019	0.029

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses. The Fisher statistic presents a test of joint significance of estimated coefficients. Hansen OID and Kleibergen-Paap (KP) test respectively the over-identification restriction and the hypothesis that equations are under-identified. FD instrumentation test, with a lower p-value, indicates that endogenous regressors (fiscal decentralisation) are significantly correlated with the instrumental variables (political and government fractionalisation, and natural resources).

Source: Authors' calculations.

A non-linearity analysis seems to indicate that a sufficient degree of expenditure decentralisation is required to bring about positive impacts. The non-linearity is investigated through equation (4), and the results are presented in Table 9.4. For the entire sample, the fiscal decentralisation variable and its squared term significantly affect the efficiency of public services (Columns 1 and 4). Interestingly, the coefficient of the former is negative whereas that of the latter is positive. This seems to suggest that the relationship between fiscal decentralisation and the efficiency of public service delivery is not linear, but U-shaped. A low level of fiscal decentralisation seems to be harmful; it needs to exceed about 35.7% for health and 35.4% for education to bring about improvements in the efficiency of public services.[9] At least, about one-third of public expenditure would need to be shifted to the local authorities to obtain favourable outcomes from fiscal decentralisation. This non-linear relationship might imply the importance of economies of scale in the production and delivery of public services. As many public services incur substantial initial fixed costs, if the scale of public services shifted to the local level is too small, the local authorities might have to reduce the provision of services to reduce the variable costs to cover the large initial fixed costs. Note, however, that the sufficient level of fiscal decentralisation likely differs across countries, depending on country-specific considerations.

Table 9.4. **Fiscal decentralisation and public expenditure efficiency (non-linearity)**

	Dependent variable: Estimated efficiencies					
	Health			Education		
	All	FD < *fd**	FD ≥ *fd**	All	FD < *fd**	FD ≥ *fd**
Variables	(1)	(2)	(3)	(4)	(5)	(6)
$FD_{(t-1)}$	-2.247***	-0.797***	0.210**	-1.307**	0.717	-0.061
	(-3.518)	(-3.487)	(2.415)	(-1.963)	(0.980)	(-0.395)
$FD^2_{(t-1)}$	3.149***			1.847**		
	(3.622)			(2.259)		
Real GDP $pc_{(t-1)}$	-0.003	0.032***	-0.006	-0.035**	0.049	-0.047***
	(-0.226)	(2.699)	(-1.056)	(-2.537)	(1.513)	(-4.222)
Number of observations	875	481	390	690	365	321
Countries	55	37	29	53	35	27
Fisher (*p-value*)	0.000	0.000	0.049	0.036	0.311	0.000
Hansen OID (*p-value*)	0.010	0.000	0.188	0.011	0.051	0.176
KP-under	0.001	0.004	0.000	0.077	0.019	0.000
$FD_{(t-1)}$ instrumentation (*p-value*)	0.000	0.011	0.000	0.052	0.053	0.000
$(FD_{(t-1)})^2$ instrumentation (*p-value*)	0.000			0.006		

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

The U-shaped relationship is confirmed when the sample observations are split below and above the indicative threshold. For health, when the fiscal decentralisation ratio is below the estimated indicative threshold of 35.7%, a 1% increase in fiscal decentralisation ratio reduces the efficiency by about 0.8 percentage point (Column 2 of Table 9.4). In contrast, when the decentralisation ratio reaches or exceeds the indicative threshold, decentralisation improves the efficiency of public service delivery. A 1% increase in the decentralisation ratio increases the efficiency by 0.2 percentage point (Column 3 of Table 9.4). For education, the coefficients of the fiscal decentralisation are not statistically significant when the sample observations are divided.

The findings on the U-shape relationship are supported by the dissimilar impacts of fiscal decentralisation in advanced economies and in emerging markets and developing countries. As shown in Table 9.3, fiscal decentralisation positively affects the efficiency of public services in advanced economies and negatively affects efficiency in emerging markets and developing countries. Interestingly, the level of expenditure decentralisation is on average about 40% in advanced economies, which is above the indicative threshold of about 35%. In contrast, the average level of expenditure decentralisation is only about 25% in emerging markets and developing countries, far below the indicative threshold of 35%.

Political and institutional conditions

To support public expenditure efficiency, fiscal decentralisation requires an adequate political and institutional environment. Table 9.5 presents the results of the estimation of model (5). It appears that the interactions of the decentralisation and political and institutional variables are significantly associated with the efficiency of public service delivery. Corruption negatively affects the impacts of fiscal decentralisation on the efficiency of public services.

Table 9.5. **Fiscal decentralisation and political/institutional environments**

	Dependent variable: Estimated efficiencies							
	Health				Education			
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
$FD_{(t-1)}$	-0.523	-0.809	-1.307***	-0.727***	-1.079*	-0.171	-0.764*	-0.696
	(-1.540)	(-1.137)	(-2.703)	(-3.159)	(-1.780)	(-0.217)	(-1.889)	(-1.275)
FD × Corruption$_{(t-1)}$	-0.488***				-0.608***			
	(-3.291)				(-2.738)			
FD × Parliamentary$_{(t-1)}$		4.373**				1.160		
		(2.206)				(0.836)		
FD × Regime$_{(t-1)}$			0.033***				0.0125	
			(2.967)				(1.477)	
FD × Autonomy$_{(t-1)}$				2.057***				1.952***
				(5.457)				(2.931)
Real GDP pc$_{(t-1)}$	-0.040	-0.122	-0.117***	0.013	-0.130**	-0.044	-0.0717**	-0.020
	(-1.535)	(-1.598)	(-2.803)	(1.154)	(-2.371)	(-0.920)	(-2.257)	(-1.120)
Number of observations	810	875	874	875	639	690	689	690
Countries	51	55	55	55	49	53	53	53
Fisher (*p-value*)	0.006	0.097	0.001	0.000	0.029	0.700	0.241	0.061
Hansen OID (*p-value*)	0.408	0.868	0.422	0.139	0.900	0.012	0.004	0.141
KP-under	0.040	0.175	0.013	0.001	0.076	0.134	0.067	0.092
$FD_{(t-1)}$ instrumentation (*p-value*)	0.000	0.000	0.000	0.000	0.038	0.229	0.014	0.047
FD × $I_{(t-1)}$ instrument (*p-value*)	0.058	0.226	0.000	0.000	0.161	0.115	0.000	0.000

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

When taking into account the corruption variable, a 5% increase in the fiscal decentralisation ratio is associated on average with a 2.5% decrease in the efficiency of public expenditure relative to the mean efficiency.[10] This might be due to the stronger power of interests groups at the local level. Local authorities may also have more discretion and fewer controls, giving room for leakage of public resources, as argued by Gauthier and Wane (2007).[11] In contrast, the positive and statistically significant sign of the interaction between fiscal decentralisation and the political system variables ($FD \times Parliamentary_{(t-1)}$) indicates that the combination of a parliamentary system and fiscal decentralisation may boost public expenditure efficiency. Parliamentary regimes, as opposed to presidential regimes, have stronger institutional frameworks to limit the executive's discretionary powers. Also, implementing decentralisation in a more democratic environment can improve the efficiency of public service delivery. Furthermore, the existence of constitutionally autonomous regions also has positive and statistically significant impacts. Autonomous regions may be free of any vertical constraint that could come from the top level and influence the way public expenditure is implemented locally. The non-significance of real GDP per capita used as a control variable in most cases might be because the methodology already controlled for this variable in the first step when estimating efficiency.

The role of the political and institutional environment is also confirmed when separately analysing advanced economies, emerging markets and developing countries. Table 9.6 displays the results of the estimations of equation (5) using two subsamples: 1) advanced economies; and 2) emerging markets and developing economies. First, looking at the coefficients of the fiscal decentralisation variable itself, the results support the above findings that decentralisation broadly improves the efficiency of public service delivery in advanced economies but worsens the efficiency in emerging markets and developing countries. Second, advanced economies and emerging

economies and developing countries seem to broadly confirm that an adequate political and institutional environment improves the impact of fiscal decentralisation on the efficiency of public service delivery. For both sub-groups and for both health and education, corruption has negative impacts, and the autonomy of regions has positive effects on the relationship between decentralisation and public service efficiency. This is the expected result because weak governance at the local level might lead to misuse of decentralised resources and expenditure and worsen the efficiency of public service delivery. Sufficient autonomy of local authorities vis-à-vis the central government is needed to allow the preference matching and allocation efficiency to operate fully.

Table 9.6. **Fiscal decentralisation and political/institutional environments (sub-groups)**

	Dependent variable: Estimated efficiencies							
	Health				Education			
	Advanced		EME and DC		Advanced		EME and DC	
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
$FD_{(t-1)}$	0.106	0.874*	-0.734***	-0.489***	0.17	-1.255***	-1.455***	-0.975***
	-0.264	-1.692	(-4.688)	(-3.894)	-0.392	(-2.614)	(-4.384)	(-2.864)
FD × $Corruption_{(t-1)}$	-0.274		-0.287***		-0.13		-0.470***	
	(-1.254)		(-4.618)		(-0.448)		(-3.294)	
FD × $Autonomy_{(t-1)}$		-0.264		1.344***		1.754**		1.835***
		(-0.509)		-3.908		-2.54		-2.942
Real GDP $pc_{(t-1)}$	-0.108	0.013	0.002	0.017*	-0.154	-0.064**	-0.056*	-0.010
	(-1.146)	-0.802	-0.147	-1.698	(-1.115)	(-2.077)	(-1.694)	(-0.560)
Number of observations	266	269	544	606	211	213	428	477
Countries	14	14	37	41	14	14	35	39
Fisher (*p-value*)	0.003	0.000	0.000	0.000	0.002	0.006	0.000	0.005
Hansen OID (*p-value*)	0.472	0.036	0.400	0.002	0.228	0.404	0.922	0.101
KP-under	0.521	0.036	0.004	0.000	0.642	0.049	0.064	0.007
$FD_{(t-1)}$ instrumentation (*p-value*)	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.018
FD × $I_{(t-1)}$ instrument (*p-value*)	0.171	0.000	0.002	0.000	0.538	0.002	0.050	0.000

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

Robustness

A range of sensitivity analyses is performed to assess the robustness of the findings. Outliers are excluded from the baseline estimates. Then, the baseline model is re-estimated using a dependent variable — efficiency of public service delivery — that is derived from alternative methodologies. Finally, the political and institutional variables are replaced with alternative indicators.

The results are robust to the exclusion of countries with extreme ratios of fiscal decentralisation. The analysis is conducted using a narrowed sample. Countries entirely or almost entirely centralised, i.e. with decentralisation ratios close to zero, are excluded. Also, countries that have extremely high degrees of decentralisation, i.e. decentralisation ratios exceeding 90%, are dropped. A comparison of the results displayed in Table 9.7 with those in Table 9.3 shows that the results are not driven by outliers. Regarding health, the impact of decentralisation remains positive for advanced economies, and negative for emerging markets and developing economies, corroborating the baseline findings. The thrust of the results also remains unchanged for education despite a slight difference in the magnitude of the coefficients.

Table 9.7. **Fiscal decentralisation and public expenditure efficiency: Excluding outliers**

	Dependent variable: Estimated efficiencies							
	Health				Education			
	Excluding outliers		0%<fd<90%		Excluding outliers		0%<fd<90%	
	Advanced	EME and DC	Advanced	EME and DC	Advanced	EME and DC	Advanced	EME and DC
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
$FD_{(t-1)}$	0.599***	0.338***	0.599***	-0.388***	-0.0453	-0.884**	-0.0453	-0.931**
	(-7.956)	(-3.023)	(-7.956)	(-3.315)	(-0.339)	(-2.560)	(-0.339)	(-2.410)
Real GDP $pc_{(t-1)}$	0.00763	0.0224***	0.00763	0.0134	-0.0767***	-0.00773	-0.0767***	0.00673
	(0.778)	(2.627)	(0.778)	(1.426)	(-4.339)	(-0.437)	(-4.339)	(-0.341)
Number of observations	269	593	269	531	213	467	213	426
Countries	14	40	14	37	14	38	14	35
Fisher (*p-value*)	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.056
Hansen OID (*p-value*)	0.008	0.000	0.008	0.000	0.000	0.005	0.000	0.037
KP-under	0.000	0.000	0.000	0.000	0.002	0.056	0.002	0.061
$FD_{(t-1)}$ instrumentation (*p-value*)	0.000	0.000	0.000	0.000	0.000	0.033	0.000	0.035

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

The findings are robust to alternative methodologies of efficiency estimates. Two methodologies are employed to compute alternative estimates of the efficiency of public service delivery: a variant of stochastic frontier analysis based on Jondrow et al. (1982) and a methodology that takes into account the sample heterogeneity and heteroskedasticity. The results shown in Table 9.8 focus on the role of political and institutional variables, and confirm the findings from the baseline analysis.[12] Under both alternative efficiency estimates, and for both health and education, corruption hinders — with high statistical significance — the impacts of fiscal decentralisation on public service efficiency. The favourable role of parliamentary regimes and more democratic institutions in combination with fiscal decentralisation is also confirmed, despite weak statistical significance in some cases. The positive impact of the autonomy of regions on the relationship between fiscal decentralisation and the efficiency of public service delivery is ascertained with high statistical significance in all cases (alternative efficiency estimates and health and education).

Table 9.8. **Fiscal decentralisation and public expenditure efficiency: Alternative efficiency estimates**

	Dependent variables: Estimated efficiencies															
	Health								Health							
	The Jondrow et al. (1982) approach				Heterogeneous efficiencies				The Jondrow et al. (1982) approach				Heterogeneous efficiencies			
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**`(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
$FD_{(t-1)}$	-0.560	-0.866	-1.392***	-0.781***	-0.488***	-0.389	-0.552***	-0.546***	-1.087*	-0.174	-0.774*	-0.702	-1.726**	-0.694	-1.254**	-1.327*
	(-1.556)	(-1.142)	(-2.711)	(-3.181)	(-2.962)	(-1.424)	(-2.770)	(-2.665)	(-1.780)	(-0.220)	(-1.897)	(-1.277)	(-2.319)	(-0.632)	(-2.074)	(-1.798)
FD × $Corruption_{(t-1)}$	-0.518***				-0.110**				-0.612***				-0.778***			
	(-3.284)				(-2.543)				(-2.738)				(-2.873)			
FD × $Parliamentary_{(t-1)}$		4.663**				0.979				1.161				1.777		
		(2.208)				(1.508)				(0.833)				(0.872)		
FD × $Regime_{(t-1)}$			0.0355***				0.009**				0.0126				0.0184	
			(2.970)				(2.970)				(1.477)				(1.451)	
FD × $Autonomy_{(t-1)}$				2.199***				1.069***				1.965***				3.121***
				(5.504)				(2.732)				(2.939)				(3.243)
Real GDP $pc_{(t-1)}$	-0.0415	-0.13	-0.125***	0.0144	-0.099***	-0.112***	-0.132***	-0.084***	-0.131**	-0.044	-0.072**	-0.020	-0.089	0.023	-0.036	0.053**
	(-1.516)	(-1.596)	(-2.825)	(1.182)	(-11.046)	(-4.312)	(-5.617)	(-7.668)	(-2.377)	(-0.922)	(-2.256)	(-1.136)	(-1.306)	(0.322)	(-0.732)	(2.185)
Number of observations	810	875	874	875	719	778	777	778	639	690	689	690	639	690	689	690
Countries	51	55	55	55	51	55	55	55	49	53	53	53	49	53	53	53
Fisher (*p-value*)	0.006	0.095	0.001	0.000	0.000	0.000	0.000	0.000	0.029	0.695	0.239	0.060	0.001	0.011	0.001	0.000
Hansen OID (*p-value*)	0.398	0.871	0.437	0.136	0.009	0.154	0.085	0.246	0.901	0.012	0.004	0.141	0.722	0.028	0.033	0.425
KP-under	0.040	0.175	0.013	0.001	0.000	0.013	0.000	0.000	0.076	0.134	0.067	0.092	0.076	0.134	0.067	0.092
$FD_{(t-1)}$ instrumentation (*p-value*)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.229	0.014	0.047	0.038	0.229	0.014	0.047
FD × $I_{(t-1)}$ instrument (*p-value*)	0.058	0.226	0.000	0.000	0.000	0.039	0.000	0.000	0.161	0.116	0.000	0.000	0.161	0.116	0.000	0.000

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

The thrusts of the results remain unchanged under an approach that absorbs short-term fluctuations. Fiscal decentralisation changes slowly over time and plausibly affects the efficiency of public services with time lags. Thus, it is useful to check the robustness of the results using averages of the variables over a few-year period. Accordingly, all variables are averaged over a four-year period. In the efficiency of public service delivery and the fiscal decentralisation variables, the latter is introduced with a one-period lag. The results, displayed in Table 9.9, support the baseline findings. Decentralisation improves the efficiency of public expenditure in advanced economies (Columns 2 and 8). The impact seems negative for emerging markets and developing countries, but it is not statistically significant. In terms of interactive variables, the negative impact of corruption is confirmed (Columns 4 and 10). The favourable contribution of parliamentary regimes is also ascertained (Columns 5 and 11). As for the autonomy of regions, the impact is positive but not statistically significant.

Furthermore, the results are broadly robust to alternative political and institutional variables. The following alternative variables are employed: bureaucracy, political stability and checks and balances.[13] All those alternative variables lead to broadly similar inferences as under the baseline analysis; the signs of the coefficients are mostly as expected, although statistical significance is low in many cases (Table 9.10).

Table 9.9. **Fiscal decentralisation and public expenditure efficiency: Absorbing short-term fluctuations**

	Dependent variables: Four-year average of estimated efficiencies											
	Health						Education					
	All	Advanced EME and DC		Political interactions			All	Advanced EME and DC		Political interactions		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
FD(t-1)	-0.092	0.294***	-0.759	-0.350	-0.313	-1.637	-0.001	0.482***	-0.460	-0.550	-3.718	0.180
	(-0.362)	(3.091)	(-1.514)	(-1.198)	(-0.512)	(-1.506)	(-0.001)	(3.636)	(-0.642)	(-1.179)	(-1.139)	(0.136)
FD × Corruption(t-1)				-0.136						-0.343***		
				(-1.539)						(-2.654)		
FD × Parliamentary(t-1)					1.977*						4.912	
					(1.689)						(1.148)	
FD × Autonomy(t-1)						1.455						0.0738
						(1.607)						(0.068)
Real GDP pc(t-1)	0.033***	0.013	0.028	0.003	-0.049	0.020	-0.012	-0.124***	0.007	-0.047	-0.155	-0.011
	(3.484)	(0.698)	(1.400)	(0.109)	(-0.868)	(0.832)	(-0.414)	(-3.991)	(0.217)	(-1.187)	(-0.969)	(-0.268)
Number of observations	221	63	158	203	221	221	199	61	138	184	199	199
Countries	55	14	41	51	55	55	52	14	38	48	52	52
Fisher (*p-value*)	0.002	0.002	0.016	0.011	0.231	0.218	0.909	0.001	0.815	0.078	0.83	0.996
Hansen OID (*p-value*)	0.012	0.219	0.318	0.422	0.674	0.691	0.065	0.059	0.045	0.267	0.899	0.087
KP-under	0.522	0.107	0.698	0.361	0.569	0.717	0.507	0.134	0.667	0.255	0.646	0.704

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

Table 9.10. **Fiscal decentralisation and public expenditure efficiency: Alternative political and institutional variables**

	Dependent variable: Estimated efficiencies											
	Health						Education					
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
FD(t-1)	-0.486*	0.953***	-0.597***	-1.408	-0.480***	-0.022	-0.007	0.786**	-0.409	-0.811	0.565	-0.014
	(-1.838)	(3.609)	(-3.131)	(-1.513)	(-2.741)	(-0.061)	(-0.003)	(2.143)	(-1.382)	(-1.310)	(1.519)	(-0.008)
FD × Assembly elec.(t-1)	3.672***						5.499					
	(3.093)						(0.525)					
FD × Presidential(t-1)		-1.737***						-1.410***				
		(-4.999)						(-2.583)				
FD × All house(t-1)			0.541***						0.13			
			(3.846)						(1.452)			
FD × Bureaucracy(t-1)				0.379						0.16		
				(0.953)						(0.644)		
FD × Political stab.(t-1)					0.102						0.459	
					(0.781)						(1.394)	
FD × Checks balances(t-1)						0.141						-1.032
						(0.924)						(-1.216)
Real GDP pc(t-1)	0.054***	0.002	0.004	-0.008	0.006	0.009	0.023	-0.034**	-0.027***	-0.032	-0.022	0.080
	(5.817)	(0.169)	(0.394)	(-0.282)	(0.412)	(0.540)	(0.786)	(-2.319)	(-2.715)	(-1.541)	(-1.065)	(0.910)
Additional controls	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Number of observations	875	875	844	807	602	868	690	690	664	639	482	684
Countries	55	55	54	51	55	55	53	53	51	49	51	53
Fisher (*p-value*)	0.000	0.000	0.000	0.000	0.000	0.596	0.533	0.016	0.003	0.074	0.039	0.812
Hansen OID (*p-value*)	0.009	0.631	0.001	0.003	0.000	0.012	0.598	0.011	0.000	0.002	0.094	0.483
KP-under	0.013	0.000	0.000	0.135	0.024	0.426	0.872	0.109	0.062	0.262	0.007	0.858
FD(t-1) instrumentation	0.000	0.000	0.000	0.000	0.004	0.000	0.302	0.024	0.034	0.057	0.045	0.075
FD × I (t-1) instrument	0.042	0.000	0.000	0.002	0.141	0.622	0.263	0.228	0.000	0.385	0.059	0.938

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

Revenue decentralisation

Revenue decentralisation can contribute to public service efficiency. Revenue decentralisation shows positive and statistically significant impacts on public service delivery for advanced economies and emerging economies and developing countries (Table 9.11). The findings are robust to alternative estimates of the efficiency variable, based on Jondrow et al. (1982) (Table 9.12) or adjusting for heterogeneity (Table 9.12). The robustness is further ascertained by excluding outliers or by restricting the sample to only the countries that have revenue decentralisation between 0% and 90% (Table 9.13). For health and education, and for advanced economies and emerging economies and developing countries, revenue decentralisation positively affects the efficiency of public service delivery. These findings might imply the need to accompany expenditure decentralisation with sufficient revenue decentralisation to ensure improved performance.[14]

Table 9.11. **Revenue decentralisation: Baseline and country-specific estimates**

	Dependent variable: estimated efficiencies					
	Health			Education		
	All	Advanced	EME and DC	All	Advanced	EME and DC
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
FD revenue(t-1)	0.57***	0.561***	0.0487	1.275**	0.666***	0.673*
	(4.334)	(6.168)	(0.416)	(2.524)	(4.297)	(1.771)
Real GDP pc(t-1)	0.0485***	-0.0424**	-0.0551***	0.0381	0.0271	-0.0104
	(5.778)	(-1.963)	(-3.061)	(1.640)	(0.874)	(-0.242)
Time dummies	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
Number of observations	904	269	635	714	213	501
Countries	55	14	41	53	14	39
Fisher-p *(p-value)*	0.000	0.000	0.000	0.042	0.000	0.174
Hansen OID *(p-value)*	0.000	0.000	0.008	0.033	0.003	0.001
KP-under	0.000	0.001	0.000	0.011	0.020	0.001

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

Table 9.12. **Revenue decentralisation: Alternative efficiency estimates**

	Dependent variable: estimated efficiencies					
	Health			Education		
	All	Jondrow et al. (1982)	Heterog.	All	Jondrow et al. (1982)	Heterog.
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
FD revenue(t-1)	0.57***	0.616***	-0.098	1.275**	1.286**	1.653***
	(4.334)	(4.429)	(-0.997)	(2.524)	(2.532)	(2.799)
Real GDP pc(t-1)	0.048***	0.053***	-0.078***	0.038	0.038	0.125***
	(5.778)	(5.842)	(-12.645)	(1.640)	(1.627)	(4.503)
Time dummies	**No**	**No**	**No**	**No**	**No**	**No**
Number of observations	904	904	805	714	714	714
Countries	55	55	55	53	53	53
Fisher-p *(p-value)*	0.000	0.000	0.000	0.042	0.041	0.000
Hansen OID *(p-value)*	0.000	0.000	0.001	0.033	0.034	0.029
KP-under	0.000	0.000	0.000	0.011	0.011	0.011

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

Table 9.13. **Revenue decentralisation: Excluding outliers**

	Dependent variable: Estimated efficiencies							
	Health				Education			
	Excluding outliers		0%<*fd* <90%		Excluding outliers		0%<*fd* <90%	
	Advanced	EME and DC	Advanced	EME and DC	Advanced	EME and DC	Advanced	EME and DC
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD(t-1)	0.670***	0.463***	0.670***	0.366**	0.094	1.051*	0.094	1.036**
	(8.023)	(3.308)	(8.023)	(2.455)	(0.680)	(1.892)	(0.680)	(2.324)
Real GDP pc(t-1)	0.041***	0.046***	0.041***	0.036***	-0.082***	0.054**	-0.082***	0.039
	(3.057)	(4.983)	(3.057)	(3.35)	(-5.654)	-2.028	(-5.654)	-1.595
Number of observations	269	622	269	528	213	491	213	423
Countries	14	41	14	37	14	39	14	35
Fisher (*p-value*)	0.000	0.000	0.000	0.004	0.000	0.081	0.000	0.063
Hansen OID (*p-value*)	0.040	0.000	0.040	0.000	0.000	0.003	0.000	0.007
KP-under	0.000	0.000	0.000	0.000	0.004	0.012	0.004	0.003
FD(t-1) instrumentation (*p-value*)	10.445	11.122	10.445	8.222	6.387	3.573	6.387	4.399

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

The importance of a favourable institutional environment is also confirmed by the analysis of revenue decentralisation (Table 9.14). Corruption decreases the positive impact of revenue decentralisation on the efficiency of public service delivery. Despite the negative influence of the regime variable, which accounts for the strength of the democracy, the overall effect of revenue decentralisation remains positive. The checks and balances variable, which is incrementally coded with the existence of effective control over the executive and legislature in a presidential system, enhances the contribution of revenue decentralisation.

Table 9.14. **Revenue decentralisation: Political/institutional interactions**

	Dependent variable: estimated efficiencies							
	Health				Education			
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD Revenue(t-1)	0.116	0.944***	1.443**	-0.26	-0.613	3.436**	2.052**	0.593
	(0.598)	(3.050)	(2.379)	(-0.513)	(-0.896)	(2.266)	(2.019)	(0.707)
FDR × Corruption(t-1)	-0.170***				-0.458***			
	(-3.787)				(-3.853)			
FDR × Regime(t-1)		-0.018**				-0.040*		
		(-2.456)				(-1.951)		
FDR × Parliamentary(t-1)			-2.297				-0.997	
			(-1.406)				(-0.836)	
FDR × Checks(t-1)				0.264**				0.12
				(2.110)				(0.739)
Real GDP pc(t-1)	0.039***	0.053*	0.108**	0.026	0.005	0.244**	0.073	0.016
	(3.690)	(1.729)	(2.488)	(1.287)	(0.212)	(2.002)	(1.547)	(0.481)
Additional controls	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Number of observations	836	903	904	895	660	713	714	706
Countries	51	55	55	55	49	53	53	53
Fisher (*p-value*)	0.000	0.000	0.000	0.022	0.000	0.221	0.279	0.209
Hansen OID (*p-value*)	0.007	0.022	0.066	0.677	0.975	0.674	0.150	0.042
KP-under	0.000	0.000	0.532	0.059	0.085	0.086	0.114	0.216

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.

Source: Authors' calculations.

Conclusion

Fiscal decentralisation can serve as a policy tool to improve the efficiency of public service delivery, but only under some conditions. Expenditure decentralisation seems to have improved service delivery in advanced economies, but its impact in emerging economies and developing countries seems somewhat mixed. The empirical findings in this chapter indicate that expenditure decentralisation needs to exceed a threshold of about 35% to improve service delivery. However, revenue decentralisation seems to have positive impacts across all country groups. This seems to indicate the need to accompany the decentralisation of responsibilities with sufficient decentralisation of resources.

Findings under expenditure decentralisation and under revenue decentralisation point to the need for a favourable institutional and political environment. Effective autonomy of local governments is required to allow preference matching and the allocative efficiency hypothesis to operate. Strong accountability of local authorities vis-à-vis the local population is necessary to allow the productive efficiency hypothesis to operate. Corruption needs to be tackled to prevent misuse of public resources. And capacity needs to be strengthened at the local level. Absent these conditions, fiscal decentralisation can worsen public service delivery.

An extension of this chapter could include an analysis of an alternative indicator of policy outcome and an investigation of the impact of decentralisation on macroeconomic performance. Alternative outcome indicators, such as life expectancy at birth and adjusted primary education net enrolment rate, are presented in the chapter to confirm the robustness of the results (Annex Table 9.A3). However, it would be insightful to conduct the analysis using life expectancy, school drop-out rates, or (Programme for International Student Assessment) PISA scores as these variables might exhibit a wider variance across countries and over time. Moreover, it would be essential to analyse the impact of decentralisation on key macroeconomic performance metrics, such as fiscal outcomes and GDP growth as improvements in public expenditure efficiency can be a channel through which decentralisation ultimately influences those variables.

Notes

1. Previous studies focused solely on a specific country or a specific group of countries.
2. Alternatively, the efficiency analysis can also aim at reducing inputs while keeping the outcome unchanged.
3. A stream of the existing literature assumes time-invariant efficiency. However, the assumption of invariant efficiency might be questionable, especially in the presence of long panel data. We relax the assumption of time-invariant efficiency and allow for time-varying individual-specific efficiencies (Cornwell, Schmidt and Sickles, 1990).

4. Local governments can include states, regions, districts, municipalities, and other level(s) of government, depending on the institutional arrangement in the country.

5. Owing to difficulties in obtaining data from local and regional governments, our fiscal decentralisation index is obtained as the residual after deducting the ratio of central government share of expenditure over total general government expenditure. This approach can have some caveats, but it allows for large country and period coverages.

6. The vertical fiscal imbalance, i.e. the share of local government expenditure financed with its own revenue, can also provide important insights; however, this indicator is not available for the full sample in this study.

7. To avoid perfect collinearity, we exclude the variable average year of schooling while estimating the effect of public education expenditure on the secondary school enrolment rate. GDP per capita is used as a control variable when estimating the effect of fiscal decentralisation on public expenditure efficiency.

8. The country grouping follows the classification in the World Economic Outlook (2014). It would be insightful to divide the second group in emerging market economies (EMEs) and low-income countries (LICs); however, the variables in this analysis are available only for a limited number of LICs, impeding a thorough empirical analysis for this group separately.

9. Based on the estimated parameters in Table 9.4, the decentralisation indicative threshold for the health sector is computed as:

$$\frac{\partial \hat{\eta}_{it}}{\partial fd_{it-1}} = \delta_1 + 2 \times \delta_2 fd \Rightarrow fd^* = -\frac{\delta_1}{2\delta_2} \text{ or } fd^* = \left(-\frac{(-2.247)}{(2 \times 3.149)}\right) \times 100 = 35.7$$

The threshold for the education sector was derived similarly.

10. The marginal effect of corruption is obtained as in Ebeke (2012) as follows: (-0.488×0.05) ×100=-2.4.

11. Treisman (1999, 2000) argues that federal states may be perceived as more corrupt, because of their larger size compared to unitary states.

12. The pattern of non-linearity is also broadly confirmed under the alternative efficiency estimates, but with lower statistical significance.

13. The checks and balances variable measures the existence of effective control over the executive and legislative branches in a presidential system. In parliamentary systems, checks and balances measure whether there is a one, two, or three or more party coalition controlling the government.

14 . This analysis could be complemented with a direct investigation of the impact of the vertical fiscal imbalance; however, the latter variable is not available for most countries in the sample.

References

Ahmad, E., G. Brosio and V. Tanzi (2008), "Local service provision in selected OECD countries: Do decentralized operations work better?", *IMF Working Paper* 08/67.

Arze del Granado, F.A., J. Martinez-Vazquez and R. McNab (2005), "Fiscal decentralization and the functional composition of public expenditures", *International Center for Public Policy Working Paper Series*, https://ideas.repec.org/s/ays/ispwps.html.

Battese, G.E. and T.J. Coelli (1988), "Prediction of firm-level technical efficiencies: With a generalized frontier production function and panel data", *Journal of Econometrics*, Vol. 38, pp. 387-399.

Bénassy-Quéré, A., N. Gobalraja and A. Trannoy (2007), "Tax and public input competition", *Economic Policy, CEPR & CES & MSH*, 22(4), pp. 385-430, http://ideas.repec.org/s/bla/ecpoli.html.

Bordignon, M., F. Cerniglia and F. Revelli (2004), "Yardstick competition in intergovernmental relationships: Theory and empirical predictions", *Economics Letters*, Vol. 83, pp. 325–333.

Cantarero, P.D. and M.P. Sanchez (2006), "Decentralization and health care outcomes: An empirical analysis within the European Union", Working Paper, University of Cantabria, Spain.

Cornwell, C., P. Schmidt and R. Sickles (1990), "Production frontiers with cross sectional and time series variation in efficiency levels", *Journal of Econometrics*, Vol. 46, pp. 185- 200.

Davoodi, H. and H. F. Zou (1998), "Fiscal decentralization and economic growth: A cross-country study", *Journal of Urban Economics*, 43(2), pp. 244-257.

Dziobek, C., C. Gutierrez-Mangas and P. Kufa (2011), "Measuring fiscal decentralization – Exploring the IMF's databases", *IMF Working Paper* 11/126.

Ebeke, C. H. (2012), "The power of remittances on the international prevalence of child labor", *Structural Change and Economic Dynamics*, 23(4), pp. 452–462.

Escolano, J. et al. (2012), "Fiscal performance, institutional design and decentralization in European Union countries", *IMF Working Papers* 12/45.

Ezcurra, R. and A. Rodríguez-Pose (2010), "Does decentralization matter for regional disparities? A cross-country analysis", *Journal of Economic Geography*, Oxford University Press, 10(5), pp. 619-644, http://ideas.repec.org/s/oup/jecgeo.html.

Fredriksen, K. (2013), "Decentralisation and economic growth - Part 3: Decentralisation, infrastructure investment and educational performance", *OECD Working Papers on Fiscal Federalism*, No. 16, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k4559gg7wlw-en.

Gauthier, B. and W. Wane (2007), "Leakage of public resources in the health sector: An empirical investigation of Chad", *Policy Research Working Paper Series*, No. 4351.

Gonzalez-Alegre, J. (2010), "Decentralization and the composition of public expenditure in Spain", *Regional Studies*, 44(8), pp. 1067-1083, http://ideas.repec.org/s/taf/regstd.html.

Grigoli, F. and J. Kapsoli (2013) "Waste not, want not: The efficiency of health expenditure in emerging and developing economies", *IMF Working Papers* 13/187, http://ideas.repec.org/p/imf/imfwpa/13-187.html.

Grisorio, M.J. and F. Prota (2011), "The impact of fiscal decentralization on the composition of public expenditure: panel data evidence from Italy", *Societa italiana degli economisti*, Vol. 52.

Gupta, S. and M. Verhoeven (2001), "The efficiency of government expenditure: Experiences from Africa", *Journal of Policy Modelling*, Vol. 23, pp. 433–467.

Gupta, S. et al. (2007), "Fiscal management of scale-up aid", *IMF Working Paper*, No. 07/222.

Hayek, V. F. (1945), "The use of knowledge in society", *American Economic Review*, 35(4), pp. 519-530.

Herrera, S. and G. Pang (2005), "Efficiency of public spending in developing countries: An efficiency frontier approach", *World Bank Policy Research Working Paper*, No. 3645.

Hindriks, J. and B. Lockwood (2005), "Decentralization and electoral accountability: Incentives, separation and voter welfare", *CEPR Discussion Paper*, No. 5125.

Jayasuriya, R. and Q. Wodon (2003), "Efficiency in reaching the Millennium Development Goals", *World Bank Working Paper*, No. 9.

Jiménez-Rubio, D. (2011), "The impact of fiscal decentralization on infant mortality rates: Evidence from OECD countries", *Social Science and Medicine*, 73(9), pp. 1401-1407.

Jondrow, J. et al. (1982), "On the estimation of technical inefficiency in the stochastic frontier production function model", *Journal of Econometrics*, Vol. 19, pp. 233-238.

Kappeler, A. and T. Valila (2008), "Fiscal federalism and the composition of public investment in Europe", *European Journal of Political Economy*, 24(3), pp. 562-570.

Keen, M. and M. Marchand (1997), "Fiscal competition and the pattern of public spending", *Journal of Public Economics*, Elsevier, 66(1), pp. 33-53, http://ideas.repec.org/s/eee/pubeco.html.

Musgrave, R. (1969), "Theories of fiscal federalism", *Public Finance*, 24(4), pp. 521–32.

Oates, W. E. (1972), *Fiscal Federalism*, Harcourt Brace Jovanovich, New York.

Persson, T. and G. Tabellini (2000), "Political economics: Explaining economic policy", *MIT Press*, Cambridge, MA.

Phillips, K. and G.M. Woller (1998), "Fiscal decentralization and LDC economic growth: An empirical investigation", *Journal of Development Studies*, 34(4), pp. 139-148, http://ideas.repec.org/s/taf/jdevst.html.

Seabright, P. (1996), "Accountability and decentralization in government: An incomplete contracts model", *European Economic Review*, Vol. 40, pp. 61-89.

Ter-Minassian, T. (1997), "Decentralization and macroeconomic management", *IMF Working Paper* 97/155.

Tiebout, C. (1956),"A pure theory of local expenditures", **Journal** *of Political Economy,* Vol. 64, No. 5, pp. 416-424.

Treisman, D. (2000), "The causes of corruption: A cross-national study", *Journal of Public Economics*.

Treisman, D. (1999), "After the deluge: Regional crises and political consolidation in Russia", *American Journal of Political Science*.

Zhang, T. and H. Zou (1998), "Fiscal decentralization, public spending, and economic growth in China", *Journal of Public Economics*, 67(2), pp. 221-240, http://ideas.repec.org/a/eee/pubeco/v67y1998i2p221-240.html

Further reading

Barankay, I. and B. Lockwood (2007), "Decentralization and the productive efficiency of government: Evidence from Swiss cantons", *Journal of Public Economics* 91, pp. 1197-1218.

Bardhan, P. and D. Mukherjee (2002), "Decentralization of governance and development", *Journal of Economic Perspectives*, pp. 185-205.

Battese, G. E. and T. J. Coelli (1995), "A model for technical inefficiency effects in a stochastic frontier production function for panel data", *Empirical Economics*, Vol. 20, pp. 325–332.

Besley, T. and M. Smart (2007), "Fiscal restraints and voter welfare", *Journal of Public Economics*, Vol. 91, pp. 755–773.

Davoodi, H., D. Xie and H. Zou (1999), "Fiscal decentralization and economic growth in the United States", *Journal of Urban Economics* 45, pp. 228-239.

Greene, W.H. (2005), "Efficiency of public spending in developing countries: A stochastic frontier approach", World Bank.

Grigoli, F. (2014), "A hybrid approach to estimating the efficiency of public spending on education in emerging and developing economies", *IMF Working Paper* 14/19, http://ideas.repec.org/p/imf/imfwpa/14-19.html.

Kavosi, Z. et al. (2013), "The effect of fiscal decentralization on under-five mortality in Iran: A panel data analysis", *International Journal of Health Policy and Management*, 1(4), pp. 301-306.

Oates, W. E. (1999), "An essay on fiscal federalism", *Journal of Economic Literature* 37(3), pp. 1120-1149.

Picazo, O. F., D.A. Robalino and A. Voetberg (2001), "Does fiscal decentralization improve health outcomes? Evidence from a cross-country analysis", *World Bank Policy Research Working Paper*, No. 2565.

Redoano, M. (2003), "Does centralization affect the number and size of lobbies?", *CSGR Discussion Paper*, No. 604, University of Warwick.

Ter-Minassian, T. (1997), *Fiscal Federalism in Theory and Practice*, International Monetary Fund, Washington, DC.

Thornton, J. (2007), "Fiscal decentralization and economic growth reconsidered", Journal of Urban Economics, 61(1), pp. 64-70.

Annex 9.A1

Countries, data coverage and sources

Table 9.A1.1. **Countries, data coverage and sources**

Countries	Coverage	Sources	Countries	Coverage	Sources
Argentina	1993–2004	GFS, WEO	Korea	2000–2012	OECD database
Australia	1990–2011	OECD database	Latvia	1995–2012	Eurostat
Austria	1990–2012	Eurostat	Lesotho	1990–2008	GFS, WEO
Bahrain	1990–2004	GFS, WEO	Lithuania	1995–2012	Eurostat
Belarus	2001–2010	GFS, WEO	Luxembourg	1990–2012	Eurostat
Belgium	1990–2012	Eurostat	Maldives	1990–2011	GFS, WEO
Bhutan	1990–2009	GFS, WEO	Malta	1995–2012	Eurostat
Bolivia	1990–2007	GFS, WEO	Mauritius	2000–2011	GFS, WEO
Brazil	1997–2012	GFS, WEO	Mexico	1990–2012	GFS, WEO
Bulgaria	1995–2012	Eurostat	Mongolia	1992–2012	GFS, WEO
Canada	1990–2010	OECD database	Netherlands	1990–2012	Eurostat
Chile	1990–2012	GFS, WEO	New Zealand	1990–2012	OECD database
Croatia	2002–2012	Eurostat	Norway	1990–2012	Eurostat
Cyprus	1995–2012	Eurostat	Pakistan	1990–2007	GFS, WEO
Czech Republic	1995–2012	Eurostat	Peru	1995–2012	GFS, WEO
Denmark	1990–2012	Eurostat	Poland	1995–2012	Eurostat
Egypt	2002–2012	GFS, WEO	Portugal	1990–2012	Eurostat
Estonia	1995–2012	Eurostat	Romania	1995–2012	Eurostat
Finland	1990–2012	Eurostat	Seychelles	1993–2012	GFS, WEO
France	1990–2012	Eurostat	Singapore	1990–2012	GFS, WEO
Georgia	1997–2012	GFS, WEO	Slovak Republic	1995–2012	Eurostat
Germany	1990–2012	Eurostat	Slovenia	1995–2012	Eurostat
Greece	1995–2012	Eurostat	South Africa	1990–2012	GFS, WEO
Hungary	1995–2012	Eurostat	Spain	1995–2012	Eurostat
Iceland	1995–2012	Eurostat	Sweden	1993–2012	Eurostat
India	1990–2012	GFS, WEO	Switzerland	1990–2012	Eurostat
Indonesia	1990–2004	GFS, WEO	Tunisia	1990–2012	GFS, WEO
Iran	1990–2009	GFS, WEO	Turkey	1990–2012	OECD database
Ireland	1990–2012	Eurostat	United Kingdom	1990–2012	Eurostat
Israel	1995–2012	OECD database	United States	1990–2012	OECD database
Italy	1990–2012	Eurostat	Uruguay	1999–2012	GFS, WEO
Japan	1990–2012	OECD database	Venezuela	1990–2005	GFS, WEO

Note: GFS = *Governments Financial Statistics*; WEO = *World Economic Outlook*

1. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

2. **Note by Turkey**: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

3. **Note by all the European Union Member States of the OECD and the European Union**: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Annex 9.A2

Variables, definitions and data sources

Table 9.A2.1. **Variables, definitions and data sources**

Variables	Description	Sources
Fiscal variables		
Expenditure decentralisation	Fiscal decentralisation – Expenditures side	Eurostat, *Governments Financial Statistics* (GFS), OECD and *World Economic Outlook* (WEO)
Revenue decentralisation	Fiscal decentralisation – Revenue side	
Demographic and macro variables		
IMR	Mortality rate, infant (per 1 000 live births)	World Bank, *World Development Indicators 2014*
UMR	Mortality rate, under-5 (per 1 000 live births)	
Primary education	Primary education, duration (years)	
Secondary education	Secondary education, duration (years)	
Average years of schooling	Average years of primary and secondary schooling	
Total population	Measures the size of the population	
Density	Population density (people per sq. km of land area)	
Real GDP pc	GDP per capita, PPP (constant 2011 international)	
Natural resources (% GDP)	Natural resource rents	
Health and education indicators		
Health expenditure	Health expenditure, public (% of GDP)	OECD and UNESCO databases
Primary enrolment	Gross enrolment ratio, primary, both sexes (%)	
Secondary enrolment	Gross enrolment ratio, secondary, both sexes (%)	
Education expenditure	Government expenditure on education as % of GDP (%)	
Political and institutional variables		
Polstab	Political stability measures the likelihood that the government will be destabilised by unconstitutional or violent means	World Governance Indicators, 2013 Update
Government fractionalisation	Probability that two deputies randomly picked from the government parties will be of different parties	Database of Political Institutions, 2012
Fractionalisation	The probability that two deputies picked from the legislature will be of different parties	
Parliamentary	Dummy variable that takes value 1 if the political system is parliamentary	
Democracy	Variable recording the strength of the democracy	
Autonomy	Dummy variable taking value 1 with the existence of autonomous region	
Corruption	Assessment of corruption within the political system	International Country Risk Guide database

Note: Expenditure and revenue decentralisation for European and OECD countries are taken respectively from Eurostat and OECD databases. For emerging economies and developing countries, data are from GFS and WEO.

Annex 9.A3

Alternative policy outcome variables: Life expectancy at birth and adjusted primary education net enrolment rate

Table 9.A3.1. **Fiscal decentralisation and public expenditure efficiency**

	Dependent variable: estimated efficiencies									
	Health					Education				
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
$FD_{(t-1)}$	-0.775***	-0.279***	-0.530**	-0.248	0.367***	-1.474***	0.931	-1.649***	-0.162	0.547**
	(-4.072)	(-2.833)	(-2.515)	(-0.799)	(4.924)	(-3.182)	(1.049)	(-3.104)	(-0.787)	(2.115)
$(FD_{(t-1)})^2$	1.069***	0.441***	0.868**			2.719***	-1.069	3.106***		
	(3.975)	(3.134)	(2.470)			(3.613)	(-0.976)	(3.230)		
Real GDP pc(t-1)	0.0027	0.0150***	0.000	0.006	0.002	0.045***	-0.006	0.052***	0.067***	0.013
	(-0.600)	(3.588)	(-0.019)	(0.532)	(0.520)	(3.542)	(-0.626)	(3.149)	(6.468)	(0.972)
Number of observations	926	303	623	528	394	569	188	381	321	246
Countries	58	16	42	40	30	50	14	36	32	24
Fisher (*p-value*)	0.000	0.000	0.003	0.119	0.000	0.000	0.748	0.000	0.000	0.066
Hansen OID (*p-value*)	0.014	0.000	0.002	0.148	0.253	0.020	0.198	0.011	0.001	0.129
KP-under	0.000	0.000	0.000	0.419	0.000	0.000	0.061	0.004	0.048	0.001

Note: (*), (**), and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t-statistics are shown in parentheses.
Source: Authors' calculations.

Table 9.A3.2. **Fiscal decentralisation and political/institutional environment**

	Dependent variable: estimated efficiencies							
	Health				Education			
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
$FD_{(t-1)}$	-0.065	-0.087***	-0.245***	-0.146***	-0.419	0.003	-0.111	-0.373*
	(-1.261)	(-2.969)	(-3.783)	(-3.492)	(-1.378)	(0.015)	(-0.763)	(-1.955)
FD × $Corruption_{(t-1)}$	-0.026				-0.426***			
	(-0.604)				(-2.830)			
FD × $Parliamentary_{(t-1)}$		-0.064				-3.643		
		(-0.355)				(-1.585)		
FD × $Regime_{(t-1)}$			0.008***				-0.002	
			(3.961)				(-0.493)	
FD × $Autonomy_{(t-1)}$				0.530***				1.561***
				(5.022)				(3.259)
Real GDP $pc_{(t-1)}$	0.008	0.0118*	-0.027***	0.006	-0.038	0.148***	0.057**	0.038**
	(1.449)	(1.722)	(-3.383)	(1.642)	(-1.066)	(3.376)	(2.407)	(2.220)
Number of observations	861	926	925	926	529	569	568	569
Countries	54	58	58	58	46	50	50	50
Fisher (*p-value*)	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hansen OID (*p-value*)	0.001	0.002	0.471	0.113	0.194	0.206	0.000	0.024
KP-under	0.264	0.122	0.000	0.000	0.026	0.445	0.000	0.001

Note: (*), (**) and (***) denote statistical significance level of 10%, 5% and 1% respectively. Robust t- statistics are shown in parentheses.
Source: Authors' calculations.

Chapter 10

Decentralisation and inclusive growth: Channels and implications

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This chapter discusses the relationship between intergovernmental fiscal frameworks and inclusive growth, encompassing the several channels through which such a relationship could take place. The key variables directly affected by the decentralisation process are economic variables such as gross domestic product (GDP) and its distribution but also other social outcomes, such as educational attainment. All of these contribute to shaping economic growth and its inclusiveness. Inclusiveness means that the gains from growth in economic output, income or other forms of material well-being benefit all members of society. This includes all parts of a country, e.g. growth in a territory as well as the distribution of income across territories. In this context, sub-central and central authorities can contribute to inclusiveness within a country, contributing to an even distribution of economic gains across jurisdictions and income groups, ultimately enhancing well-being for all. Moreover, the quality of the public sector also depends on how responsibilities and functions are shared between government levels. The issue at stake is that the design of fiscal decentralisation does matter for inclusive growth.

Introduction

The role of sub-national governments for overall public finance varies across countries, but has changed relatively little over time (OECD/KIPF, 2013, 2016). As highlighted earlier in this volume based on the OECD Fiscal Network's database, in 2016 sub-national governments were responsible for around one-third of general government spending, while the sub-national share of own revenue averaged 19%. In many OECD countries, most of these lower tiers of government are responsible for core public programmes; this contributes to shaping how the gains from economic activity are distributed between households and across jurisdictions. This implies that intergovernmental fiscal frameworks can critically influence growth and the inclusiveness of an economy. Inclusiveness means that the gains from growth in economic output, income or other forms of material well-being benefit all members of society. This includes all parts of a country, e.g. growth in a territory as well as the distribution of gross domestic product (GDP) or household income per capita across territories. Hence, intergovernmental fiscal frameworks appear to be a fundamental instrument for inclusive growth.

As we have seen with the negative impact of the financial crisis, which was particularly heavy for the EU countries, the need of policy coordination has emerged also in light of an increased economic interdependence. In this vein, the Europe 2020 Strategy puts the notion of inclusive growth at its core. In this strategy, inclusive growth is understood as:

> *"empowering people through high levels of employment, investing in skills, fighting poverty and modernising labour markets, training and social protection systems so as to help people anticipate and manage change, and build a cohesive society. It is also essential that the benefits of economic growth spread to all parts of the Union, including its outermost regions, thus strengthening territorial cohesion. It is about ensuring access and opportunities for all throughout the lifecycle." (European Commission, 2010)*

Broadly speaking, inclusive growth is economic growth that creates an opportunity for all segments of the population and distributes the dividends of increased prosperity, both in monetary and non-monetary terms, equitably across society.

The assumption according to which economic growth automatically delivers higher welfare to people has been recently challenged by scholars (Stiglitz, Sen and Fitoussi, 2009) because economic growth may only increase people's consumption opportunities (i.e. their economic well-being) for a limited number of people in the population, and it may not necessarily translate into higher non-economic outcomes such as education, health, and environmental quality, which are essential for people to participate fully in the economy and society more broadly.[1] Accordingly, the OECD approach to inclusive growth is multidimensional, extending beyond income, and suggesting that the proceeds of economic growth must be shared. This is especially true for education levels (such as secondary and tertiary education), healthcare, life expectancy and public infrastructure. Moreover, inclusive growth refers to equality of opportunity in terms of access to markets, employment prospects, resources and an unbiased regulatory environment for businesses and individuals.

In this context, sub-central and central authorities can contribute to inclusiveness within a country, contributing to an even distribution of economic gains across jurisdictions and income groups, ultimately enhancing well-being for all. Moreover,

the quality of the public sector also depends on how responsibilities and functions are shared between government levels. The issue at stake is that the design of fiscal decentralisation does matter for growth, especially for inclusive growth. This could work through different channels. For instance, the productivity of firms and the well-being of households could depend on the taxes sub-national governments levy and the money they spend on the various policy functions.

Moreover, the intergovernmental fiscal framework could affect the income distribution across individuals and jurisdictions through, for instance, the effectiveness of the government redistributive function. On the one hand, in a fiscally decentralised system, sub-national governments could spend less for social services and move away from progressive taxation, lowering, ultimately, the likelihood of redistribution amongst individuals (and regions) and, thus, increasing income disparities at the national level (Stigler, 1957; Musgrave, 1959; Brown and Oates, 1987). On the other hand, due to decentralisation, greater responsibilities assigned to sub-national governments should close some of the distance between local policy makers and their citizens (Ivanyna and Shah, 2014), favouring policies more sensitive to poverty and interpersonal disparities (Le Galès, 2002; Brenner, 2004), so leading to a more equal distribution of resources across income groups as well as their inclusion in the economy.

In a nutshell, the key variables directly affected by the decentralisation process are economic variables such as GDP and its distribution across individuals and jurisdictions but also other crucial social outcomes, such as educational attainment. All of these contribute to shaping economic growth and its inclusiveness. This chapter will discuss the relationship between intergovernmental fiscal frameworks and inclusive growth, encompassing the several channels through which such a relationship could take place. Finally, some broad implications for society, economy and institutions are provided.

Decentralisation and economic growth: The role of tax design

Since the 1980s, many developed countries have increased their degree of fiscal decentralisation (Blöchliger and Rabesona, 2009; Bodman and Hodge, 2010). One of the traditional theoretical arguments in favour of fiscal decentralisation is that it provides greater economic efficiency in the allocation of public resources (Oates, 1972). With this in mind, both direct and indirect linkages between decentralisation and economic growth have been identified to show greater efficiency (Martinez-Vazquez and McNab, 2003). Results from the recent empirical literature provide, however, a mixed picture and a clear-cut effect of fiscal decentralisation on GDP growth does not always emerge (see Asatryan and Feld, 2015).[2] In any case, a common finding seems to be that tax decentralisation is more conducive to growth than spending decentralisation, as also documented by Blöchliger and Agkun in Chapter 2 and Dougherty and Agkun in Chapter 3. However, some analyses carried out on OECD countries over past decades highlight that when the measure of tax decentralisation is limited to the revenues over which sub-national governments have full autonomy, its impact on economic growth is not statistically significant (e.g. Thornton, 2007). Similarly, Treisman (2006) argues that decentralisation would increase regional incentives to promote growth but, at the same time, it would provide a disincentive for the central government to promote development in aggregate terms because it will not lead to additional revenues.

One crucial point related to this is how public revenues are raised locally. Indeed, fiscal decentralisation is not always implemented in the same way, and there are considerable differences across countries, particularly regarding the design of the tax system. Differences in the taxation structure could have an impact on the incentive system of local policy makers. In this regard, more autonomous taxes may induce responsible local spending behaviour, accountability and, then, more efficiency (Oates, 2005; Weingast, 2009).

Starting from the first generation theory of fiscal federalism, attention was devoted to the tax assignment problem in a multi-layered government structure (Musgrave, 1983; McLure, 1998), claiming that taxation executed by local governments should mostly focus on property taxes and user fees. In line with this argument, Gemmell, Kneller and Sanz (2013) find evidence of positive revenue decentralisation effects on growth in OECD countries during 1972-2005. According to them, the positive sign could merely reflect the fact that local governments collect less from growth-distorting taxes than central governments, such as charges, user fees and property taxes. Indeed, property taxes are generally associated with a higher degree of tax autonomy exerted by sub-national governments over these revenues, since they are mostly based on tax separation schemes (for further details, see Liberati and Sacchi, 2013). The virtues of the local property tax (mostly the immovable component) could be ascribed to its relatively low efficiency costs and benign impact on growth (e.g. OECD, 2010; Norregaard, 2013). This is mainly due to the fact that such taxes are less likely to affect people's behaviour than income or wage taxes, making the former the most growth-friendly of all major taxes. The positive effect of property tax decentralisation on GDP growth in OECD countries has been confirmed in a recent study by Filippetti and Sacchi (2016) who show that tax decentralisation is more conducive to growth if sub-national taxes accrue mostly from autonomous revenues such as property taxes. This result provides conditional support to a more general tax and growth ranking (Arnold et al., 2011; Acosta Ormaechea and Yoo, 2012), according to which recurrent taxes on property tend to be the preferred tax instrument in terms of long-run GDP per capita.

More importantly, as the search for more "growth-friendly" tax bases (European Commission, 2013) focuses on immovable property – whose taxes are usually levied at the local level – the ongoing debate on tax shifting also involves fiscal decentralisation issues. In this vein, the simulation results for the Netherlands provided by van Eijkel and Vermeulen in Chapter 8 confirm that fiscal decentralisation can foster inclusive growth since, with few exceptions, a tax shift from the national earned income tax to either a local tax on the use of residential real estate or a local head tax does not generate large distributional effects for households in the economy and, at the same time, yields a moderately positive impact on employment. However, the high visibility of (immovable) property taxes is also related to their salience for voters – especially for low-income households – making this kind of tax reform a challenge to implement (see Blöchliger, 2015), regardless of the potential pro-growth effects and inclusiveness of the economy.

Decentralisation and income distribution

The way taxing powers are split between levels of government affects not only efficiency issues, but may also have equity implications which, ultimately, may involve the distribution of economic gains across jurisdictions and income groups. For instance, some studies find that higher tax decentralisation leads to higher income inequality (Neyapti, 2006; Sacchi and Salotti, 2014a), mainly due to the fact that sub-

national tax revenues (e.g. property taxes and user fees) are less progressive than those at the national level. More generally, this is consistent with the normative public finance theory that argues redistribution goals should be reserved to the central government (Stigler, 1957; Musgrave, 1959).

However, many programmes affecting income distribution and the poor have been increasingly devolved to sub-national authorities since there is growing recognition of the vital role of such lower tiers in facilitating, catalysing, and co-ordinating the implementation of pro-poor policies (Bahl, Martinez-Vazquez and Wallace, 2002). Ultimately, those redistributive impacts depend on the specific characteristics of the decentralisation process in each country (Martinez-Vazquez, Lago-Peñas and Sacchi, 2017). Looking at advanced economies, national governments sometimes embark simultaneously on fiscal decentralisation reforms as well as policies toward income inequality and poverty reduction (Ravallion, 1999; Rao, 2002), raising doubts as to whether these reforms are complementary or they could, in fact, undermine each other. In Europe - on top of the already federalised Austria, Germany and Switzerland - Belgium, Italy and Spain have recently introduced widespread reforms in order to enhance regional autonomy (Ezcurra and Rodríguez-Pose, 2010; Sacchi and Salotti, 2014b). At the same time, in recent years many developed countries witnessed significant changes in their income distributions aimed at stabilising income inequality (Smeeding, 2002; OECD, 2008).

Although closely related, income inequality and poverty do not have to respond in the same manner to fiscal decentralisation. It depends on how changes in the distribution affect the poorest. The empirical literature mostly looks at the two issues separately. A number of studies find a beneficial effect of fiscal decentralisation (based on expenditure measures) on income inequality measured by the Gini coefficient (von Braun and Grote, 2002; Tselios et al., 2012). Regarding decentralisation and poverty, the more encouraging results are for developing countries, where positive impacts of political and administrative decentralisation on poverty reduction tend to emerge (e.g. Crook and Manor, 1998). Less conclusive results emerge for developed countries where it is found that higher levels of fiscal decentralisation are correlated with a higher incidence of poverty (only) when this is measured as absolute levels of poverty (Sepulveda and Martínez-Vázquez, 2011). On the other hand, when the Human Development Index (HDI)[3] is used as a proxy for poverty, decentralisation is found to have a positive but nonlinear effect on it. When such broader measure of welfare is considered, we are able to assess how fiscal decentralisation can affect poverty in a variety of ways. Based on the nonlinear effect, one might conclude that sub-national governments can positively contribute to poverty reduction (i.e. the positive effect on the HDI), but only up to a threshold beyond which the local provision of services that most immediately help the poor becomes insufficient to provide effective and durable anti-poverty programmes. All these effects would translate into a lower degree of inclusive growth. However, as shown by Amin-Smith, Phillips and Simpson in Chapter 7 for the United Kingdom, the ongoing institutional reforms, aimed at reducing the degree of marginal fiscal equalisation, should lead sub-national governments in increasing local tax bases, limiting underlying spending needs and, more generally, boosting economic growth and tackling deprivation. Ultimately, these changes are designed to provide local policy-makers with stronger incentives for inclusive growth.

Decentralisation and spending programmes: The education sector

Decentralisation can directly affect income distribution by facilitating access to basic services, and indirectly by means of expenditure composition and the quality of governance. As an example, fiscal decentralisation can alter poverty and income inequality through its effects on the composition of public spending. Arze del Granado, Martinez-Vasquez and McNab (2005) argue that fiscal decentralisation would lead to more welfare spending programmes (e.g. basic healthcare and primary schools) that usually benefit the poorest (e.g. through in-kind benefits).

The issue at stake is that decentralisation can foster inclusiveness-enhancing spending programmes and affect their success when relatively more public money is spent on education or capital investment at the local level, which in turn may affect human capital formation and productivity. Indeed, job quality, education and employment opportunities (as well as health status and its outcomes) usually contribute to building wealth over time, which matters for people's well-being.

Recent contributions highlight that more decentralised frameworks, and in particular the decentralisation of spending power and functions in education, fuel inclusive education (Fredriksen, 2013). Indeed, education (primary and secondary) represents, among other public programmes and services, the bulk of spending and a core responsibility for sub-national governments in both decentralised and highly centralised countries (OECD, 2013). Moreover, the positive effect of fiscal decentralisation can also be seen in terms of educational output (e.g. Habibi et al., 2003) and school efficiency (Sutherland and Price, 2007; Falch and Fischer, 2012). An interesting result, based on a cross-country comparison, is found by Vermeulen in Chapter 5; it reveals that inequality in education outcomes is not more significant in more decentralised countries. In the same fashion, Kim, in Chapter 6, finds evidence that fiscal decentralisation, as measured by expenditure/revenue decentralisation, is associated with better educational achievement for OECD countries.

In a nutshell, the positive relationship between decentralised fiscal frameworks and economic activity pivots on education. The transmission channel from decentralisation to growth seems to run more via human capital and the government's education budgets than another type of investment (such as capital, either physical or intangible).

Decentralisation and regional development

Sub-national governments tend to compete more for mobile production factors, thus having an incentive to spend more on productive investment such as education or infrastructure and less on other public spending. In this perspective, fiscal decentralisation could promote economic growth according to the "productivity enhancement hypothesis" (Thiessen, 2003). Accordingly, the transfer of responsibility, associated with accountability, to sub-national governments may provide incentives for them not only to consider local residents' preferences but also to actively search for innovation in the production and supply of public goods and services.

This is in line with Oates' (1993) seminal arguments, which highlight that the case for fiscal decentralisation leading to greater allocative efficiency should also be applied within a dynamic framework of economic growth. While centrally-determined policies could not consider regional and local conditions in the provision of public goods and services, locally determined policies, for instance regarding infrastructure and education, could favour economic development and growth if local authorities have

input into such policy decisions. Ultimately, fiscal decentralisation can improve technical progress and regional development (Oates, 1999).

Productivity convergence across regions is usually driven by capital and labour mobility, but it could also be driven by knowledge diffusion across firms and jurisdictions, thus depending on intergovernmental fiscal frameworks (Blöchliger, Bartolini and Stossberg, 2016). Indeed, when an environment of imperfect information and, furthermore, a great variety of innovative measures are carried out to try to solve the same regional social and economic problems, innovative jurisdictions generate information that can be very valuable for the rest. Recent contributions show that fiscal decentralisation promotes regional convergence, but only in high-quality governance settings (Kyriacou, Muinelo-Gallo and Roca-Sagales, 2015).

In turn, competition among fiscal communities can make public officials from certain regions provide services at the lowest possible cost, thus increasing the technical efficiency in their jurisdiction (Martinez-Vazquez and McNab, 2003). In this respect, one of the most frequent transmission channels assumed to run from decentralisation to growth is inter-jurisdictional competition, which encourages sub-national governments to attract and retain mobile production factors through fiscal policy instruments such as a reduction in the tax burden or an increase in public investment (Keen and Marchand, 1997; Keen and Kotsogiannis, 2004).

The main idea is that sub-national governments in a decentralised environment tend to over-invest in capital services that raise corporate productivity such as transport and infrastructure and under-invest in consumptive and residential services such as amenities. In this framework, competition for production factors becomes strategic, especially when economies are spatially linked, to the extent that sub-national governments set their policies subject to the policy decisions of their neighbouring jurisdictions (Hauptmeier, Mittermaier and Rincke, 2012), or by merely observing tax and spending policy in neighbouring jurisdictions according to the yardstick competition approach (Besley and Case, 1995).

Implications for society, economy and institutions

The objective of inclusive growth is particularly relevant in high-income countries and emerging market economies, where income inequality has returned to levels not seen in the post-war period. It represents a new approach to economic growth that aims to improve living standards and share the benefits of increased prosperity more evenly across social groups. Inequalities, indeed, could also refer to other non-income outcomes such as educational attainment, health status and employment opportunities, which have become important determinants of growth and well-being. Thus, for sustainable economic growth, governments and policy makers should address the multidimensional nature of inequality and deal with its impact on different segments of the population.

In this framework, decentralised settings could play a favourable role in fostering inclusive growth. Decentralisation is also a multidimensional concept; it covers various aspects of policy and not just fiscal issues. More importantly, through decentralisation different social groups could have a voice in the policy-making process, thus helping to shape policies that reflect their needs and socio-economic conditions. The government's closeness to its people (Ivanyna and Shah, 2014) is typically associated with efficiency gains. Decentralisation of this type represents a vehicle through which people can strengthen their voice and have the decisions that affect their lives be taken

by those both closer to them, and to the reality that they live in. In particular, under decentralisation, benefits from certain public services (e.g. transport, waste collection, land use, local amenities, recreation facilities) accrue naturally to people living in a specific area, which is usually characterised by specific preferences over public goods and services and where economies of scale in the delivery of public services (education, primary healthcare) may be very limited.

Additionally, pursuing decentralisation may favour new forms of collaborative and participatory governance, increase transparency between governments and citizens, and lead to more inclusive policy design and implementation (OECD, 2015). From a political economy viewpoint, sub-national sectors should work in a complementary way with the national levels to create a suitable policy framework for inclusive growth. The complementary rests on the pillar of a better understanding of the role played by local preferences, circumstances and institutional settings in a decentralised system (OECD, 2014a). Specific features of sectoral policies and their effects on outcomes could be better achieved than it would be possible at the cross-country level.

In any case, for decentralisation to be good for inclusive growth, solid intergovernmental co-ordination is required, as is a clear division of responsibilities for the policies implemented at the different levels of government, in order to ensure better targeted place-based policies. For decentralisation to be successful for the inclusiveness of an economy, responsibilities for all levels of government are concerned. This is especially relevant for equity considerations given the potential impact of decentralisation on horizontal equity (e.g. using fiscal equalisation mechanisms), thus mitigating territorial disparities. In this perspective, decentralisation could favour inclusive growth and exploit financial, administrative and other capacities that normally differ across territories and tend to reflect the distribution of population, human capital and wealth. Additionally, as we have learned in Chapter 3 by Dougherty and Akgun, decentralisation tends to boost economic growth for countries that have a relatively higher degree of trade openness, especially if spending is locally financed.

Another relevant issue is the policy area where decentralisation is implemented. Education, for example, is a sector in which countries could gain from decentralising a broader set of functions. This is especially true in countries where the demographic dividend will last longer, as documented by Rao in Chapter 4, in the case of India. In this context, inclusive development is possible only when the fiscally disadvantaged states are empowered to provide comparable standards of public services, such as education. Inclusiveness of the educational system is, therefore, a critical aspect of inclusive growth.

The fact that there is a robust positive relationship between fiscal decentralisation and education provides support to the fact that decentralisation can lead to productive efficiency of public good provision. Moreover, as decentralisation of the education financing structure does not reduce the amount of education expenditure overall, as shown by Kim in Chapter 6, the policy implication would be that fiscal decentralisation encourages the expansion of education expenditure and its performance as well. With this in mind, sub-national governments could have incentives to increase education funding for education performance in their jurisdictions. These findings underline the virtuous effects of education decentralisation, which contributes to improving the quality of human capital and, ultimately, affects economic growth. From this perspective, future research on decentralisation and growth should focus on other individual policy areas, and specific government functions for a positive impact on inclusive growth.

A further lesson drawn from the preceding chapters is that fiscal decentralisation can improve the efficiency of public service delivery, but only under specific conditions, such as adequate political and institutional environments; a sufficient degree of expenditure decentralisation combined with a sufficient decentralisation of revenue (see Chapter 9, by Sow and Razafimahefa). Otherwise, fiscal decentralisation can actually worsen the efficiency of public service delivery. This would suggest that balanced decentralisation – i.e. based on both expenditure and revenue task assignments – is as important as focusing on particular policy functions to be decentralised in order to enhance the inclusiveness of the economy. Accordingly, asymmetric forms of decentralisation, in terms of spending and revenue decisions left to sub-national governments, should be avoided as they could be less favourable for inclusive growth. Instead of decentralisation alone, balanced decentralisation could be a more effective driver for long-term growth (see also Blöchliger and Kantorowicz, 2015). From this perspective, a more balanced assignment of policy functions across layers of government may allow for more flexible administrative arrangements, policy complementarities and better reaping economies of scale and scope as also stressed by Blöchliger and Akgun in Chapter 2.

In the end, it is worth recognising that there is not a single model of decentralisation that is the most conducive to inclusive growth, as institutions should also be adapted to places (OECD, 2014b). The policy agenda of many advanced economies in recent years has dealt with decentralisation and territorial reforms and they are still ongoing in some cases, e.g. in France, Italy and Spain (OECD, 2015). With this in mind, taking into account citizen participation and voice appears to be a crucial ingredient, as also demonstrated by recent public demonstrations and social troubles due to income and wealth distribution issues. Civil society, combined with standard institutional channels, can play an important role in defining policies devoted to all the well-being dimensions that lead to inclusive growth.

Notes

1. Actually, inequality – especially that related to income – is on the rise in OECD countries and remains very high in non-member economies.

2. In addition to works addressing whether decentralisation affects economic growth typically resorting to fiscal decentralisation, there are a few that do not disregard the political and administrative dimension of decentralisation (e.g. Filippetti and Sacchi, 2016). The political component is, indeed, positioned as one of the advantages of the decentralisation process and it should be considered in relation to economic performance.

3. Developed by the United Nations Development Program (UNDP), it combines measures of population health and longevity, knowledge and education, and standard of living.

References

Acosta Ormaechea, S. and Yoo, J. (2012), "Tax composition and growth: A broad cross-country perspective", *IMF Working Paper*, No. 12/257, International Monetary Fund, Washington, DC.

Arnold, J. M. et al. (2011), "Tax policy for economic recovery and growth", *The Economic Journal* 121(550), pp. F59–F80.

Arze del Granado, F. J., J. Martinez-Vasquez and R. McNab (2005), "Fiscal decentralization and the functional composition of public expenditures", *International Studies Program Working Papers*, No. 05-01, Georgia State University, Atlanta, GA.

Asatryan, Z., and L. P. Feld (2015), "Revisiting the link between growth and federalism: A Bayesian model averaging approach", *Journal of Comparative Economics* 43(3), pp. 772-781.

Bahl, R., J. Martinez-Vazquez and S. Wallace (2002), "State and local government choices in fiscal redistribution", *National Tax Journal* 55(4), pp. 723-742.

Besley, T. and A. Case (1995), "Incumbent behavior: Vote seeking, tax setting and yardstick competition", *American Economic Review* 85.

Blöchliger, H. (2015), "Reforming the tax on immovable property: Taking care of the unloved", *OECD Economics Department Working Papers*, No. 1205, OECD Publishing, Paris, http://dx.doi.org/10.1787/5js30tw0n7kg-en.

Blöchliger, H. and J. Kantorowicz (2015), "Fiscal constitutions: An empirical assessment", *OECD Economics Department Working Papers*, No. 1248, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jrxjctrxp8r-en.

Blöchliger, H. and J. Rabesona (2009), "The fiscal autonomy of sub-central governments: An update", *OECD Working Papers on Fiscal Federalism*, No. 9, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k97b111wb0t-en.

Blöchliger, H., D. Bartolini and S. Stossberg (2016), "Does fiscal decentralisation foster regional convergence?", *OECD Economic Policy Papers*, No. 17, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jlr3c1vcqmr-en.

Bodman, P., and A. Hodge (2010), "What drives fiscal decentralisation? Further assessing the role of income", *Fiscal Studies* 31(3), pp. 373-404.

Brenner, N. (2004), *New State Spaces: Urban Governance and the Rescaling of Statehood*, Oxford University Press, Oxford.

Brown, C. C. and W. E. Oates (1987), "Assistance to the poor in a federal system", *Journal of Public Economics* 32, pp. 307–330.

Crook, R. C. and J. Manor (1998), *Democracy and Decentralisation in South Asia and West Africa: Participation, Accountability and Performance*, Cambridge University Press, Cambridge.

European Commission (2013), *Tax Reforms in EU Member States: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, European Commission, Brussels.

European Commission (2010), *Europe 2020 Strategy*, European Commission, Brussels, http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf.

Falch, T. and J.A.V. Fischer (2012), "Public sector decentralization and school performance: International evidence", *Economic Letters* 114(3), pp. 276–279.

Filippetti, A., and A. Sacchi (2016), "Decentralization and economic growth reconsidered: The role of regional authority", *Environment and Planning C: Government and Policy* 34(8), pp. 1793-1824.

Fredriksen, K. (2013), "Decentralisation and economic growth - Part 3: Decentralisation, infrastructure investment and educational performance", *OECD Working Papers on Fiscal Federalism*, No. 16, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k4559gg7wlw-en.

Gemmell, N., R. Kneller and I. Sanz (2013), "Fiscal decentralization and economic growth: Spending versus revenue decentralization", *Economic Inquiry* 51(4), pp. 1915–1931.

Habibi, N. et al. (2003), "Decentralization and human development in Argentina", *Journal of Human Development* 4(1).

Hauptmeier, S., F. Mittermaier and J. Rincke (2012), "Fiscal competition over taxes and public inputs", *Regional Science and Urban Economics* 42(3), pp. 407-419.

Ivanyna, M. and A. Shah (2014), "How close is your government to its people? Worldwide indicators on localization and decentralization", *Economics: The Open-Access, Open-Assessment E-Journal* 8(3), pp. 1-61.

Keen, M. and C. Kotsogiannis (2004), "Federal tax competition and the welfare consequences of decentralization", *Journal of Urban Economics* 56, pp. 397-407.

Keen, M. and M. Marchand (1997), "Fiscal competition and the pattern of public spending", *Journal of Public Economics* 66, pp. 33–53.

Kyriacou, A.P., L. Muinelo-Gallo and O. Roca-Sagales (2015), "Fiscal decentralization and regional disparities: The importance of good governance", *Papers in Regional Science* 94(1), pp. 89–107.

Le Galès, P. (2002), *European Cities: Social Conflicts and Governance*, Oxford University Press, Oxford.

Liberati, P. and A. Sacchi (2013), "Tax decentralization and local government size", *Public Choice* 157, pp. 183–205.

Martinez-Vazquez, J. and R. McNab (2003), "Fiscal decentralization and economic growth", *World Development* 31(9), pp. 1597-1616.

Martinez-Vazquez, J., S. Lago-Peñas and A. Sacchi (2017), "The impact of fiscal decentralization: A survey", *Journal of Economic Surveys* 31(4), pp. 1095-1129.

McLure, C. E. (1998), "The revenue assignment problem: Ends, means and constraints", *Journal of Public Budgeting Accounting and Financial Management* 9, pp. 652–683.

Musgrave, R. (1983), "Who should tax, there, and what", in *Tax Assignment in Federal Countries*, Australian National University, Canberra.

Musgrave, R.A. (1959), *The Theory of Public Finance: A Study in Public Economy*, McGraw-Hill, New York.

Neyapti, B. (2006), "Revenue decentralization and income distribution", *Economics Letters* 92, pp. 409-416.

Norregaard, J. (2013), "Taxing immovable property: Revenue potential and implementation challenges", *IMF Working Paper*, No. 129, International Monetary Fund, Washington, DC.

Oates, W.E. (2005), "Toward a second-generation theory of fiscal federalism", *International Tax and Public Finance* 12, pp. 349-373.

Oates, W. E. (1999), "An essay on fiscal federalism", *Journal of Economic Literature* 37(3), pp. 1120-1149.

Oates, W. E. (1993), "Fiscal decentralization and economic development", *National Tax Journal* 46(2), pp. 237-243.

Oates, W. E. (1972), *Fiscal Federalism*, Harcourt Brace Jovanovich, New York.

OECD (2015), *All on Board: Making Inclusive Growth Happen*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264218512-en.

OECD (2014a), "Report on the OECD Framework for Inclusive Growth", Ministerial Council Meeting, www.oecd.org/mcm/IG_MCM_ENG.pdf

OECD (2014b), *OECD Best Practice Principles for Regulatory Policy*: *The Governance of Regulators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264209015-en.

OECD (2013), *Fiscal Federalism 2014: Making Decentralisation Work*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264204577-en.

OECD (2010), *Tax Policy Reform and Economic Growth*, OECD Publications, Paris, http://dx.doi.org/10.1787/9789264091085-en.

OECD (2008), *Growing Unequal? Income Distribution and Poverty in OECD Countries*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264044197-en.

OECD/KIPF (Korea Institute of Public Finance) (2016), *Fiscal Federalism 2016: Making Decentralisation Work*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264254053-en.

OECD/KIPF (2013), *Measuring Decentralisation. Concept and Policies*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264174849-en.

Rao, M. G. (2002), "Poverty alleviation under fiscal decentralization", in M.G. Rao (ed.), *Development, Poverty and Fiscal Policy*: *Decentralization of Institutions*, Oxford University Press, New Delhi, pp. 278–298.

Ravallion, M. (1999), "Are poorer states worse at targeting their poor?", *Economic Letters* 65(3), pp. 373–377.

Ezcurra, R. and A. Rodríguez-Pose (2010), "Does decentralization matter for regional disparities? A cross-country analysis", *Journal of Economic Geography*, Oxford University Press, 10(5), pp. 619-644, http://ideas.repec.org/s/oup/jecgeo.html.

Sacchi, A. and S. Salotti (2014a), "The effects of fiscal decentralization on household income inequality: Some empirical evidence", *Spatial Economic Analysis* 9(2), pp. 202-222.

Sacchi, A. and S. Salotti (2014b), "How regional inequality affects fiscal decentralisation: Accounting for the autonomy of subcentral governments", *Environment and Planning C: Government and Policy* 32(1), pp. 144-162.

Sepulveda, C. and J. Martınez-Vazquez (2011), "The consequences of fiscal decentralization on poverty and income inequality", *Environment and Planning C: Government and Policy* 29(2), pp. 321343.

Smeeding, T. (2002), "Globalization, inequality and the rich countries of the G-20: Evidence from the Luxembourg Income Study", *Luxembourg Income Study Paper* 320, LIS.

Stigler, G. (1957), "The tenable range of functions of local government", Joint Economic Committee, Federal Expenditure Policy for Economic Growth and Stability, World Bank, Washington, DC.

Stiglitz, J. E., A. Sen, and J-P. Fitoussi (2009), *Report by the Commission on Measurement of Economic Performance and Social Progress*, www.stiglitz-sen-fitoussi.fr/en/index.htm.

Sutherland, D. and R. Price (2007), "Linkages between performance and institutions in the primary and secondary education sector", *OECD Economics Department Working Papers*, No. 558, OECD Publishing, Paris, http://dx.doi.org/10.1787/170826717775.

Thiessen, U. (2003), "Fiscal decentralisation and economic growth in high-income OECD countries", *Fiscal Studies* 24(3), pp. 237-274.

Thornton, J. (2007), "Fiscal decentralization and economic growth reconsidered", *Journal of Urban Economics* 61(1), pp. 64–70.

Treisman, D. (2006), "Fiscal decentralization, governance, and economic performance: A reconsideration", *Economics & Politics* 18(2), pp. 219-235.

Tselios, V. et al. (2012), "Income inequality, decentralisation and regional development in Western Europe", *Environment and Planning A* 44(6), pp. 1278–1301.

von Braun, J. and U. Grote (2002), "Does decentralization serve the poor?", in Ahmad, E. and V. Tanzi (eds.), *Managing Fiscal Decentralization*, London, Routledge, pp. 68–95.

Weingast, B. R. (2009), "Second generation fiscal federalism: The implications of fiscal incentives", *Journal of Urban Economics* 65, pp. 279–293.

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