The role of municipal and provincial social expenditure in reducing local income inequality*

Tatjana Neuhuber & Antonia Schneider

This paper investigates the role of municipal, regional and provincial characteristics for local income inequality in Austria, giving special attention to the effects of public expenditure at different spatial levels. A spatial multilevel model is utilized, which combines hierarchical models with the widely in spatial regression frameworks used concept of spatial effects. This method has two main advantages over an approach that employs only one of the two. First, it allows us to acknowledge that municipalities are nested within districts which are nested in provinces. Ignoring such a clustered nature of the data might violate the assumption of independence. Second, by introducing interaction effects and hence, spatial spillovers, between municipalities, the dependence between regional observations on the lowest level is acknowledged.

We find that not only local characteristics influence municipal income inequality but also variables on higher administrative levels. This suggests that municipal features depend on wider regional characteristics due to the economic and social interdependence of municipalities nested in the same district or province. Furthermore, our analysis shows that the effect of public social spending on local Gini indices not only differs across provinces but also across municipalities. This indicates that the potential cushioning effect of social expenditure is highly localized.

**This version is a working paper*

1 Introduction

Economic inequality negatively affects societies in multiple ways. Countries with higher inequality were found to be connected with higher rates of health and social problems, ranging from higher crime rates to lower life expectancy and reduced social mobility (Pickett and Wilkinson 2015). Equalizing income is, next to the idea of equal opportunities and public responsibility, one of the founding principles of welfare states (Encyclopaedia Britannica 2022). Therefore, the contribution of public social spending to the reduction of economic inequality has always been a central topic in welfare state research (see, e.g., Grey 1975, Korpi and Palme 1998, Palme 2006, Lee 2021).

Over the last decades, population ageing, globalization, migration and economic restructuring have increased within-country inequality and put pressure on many welfare states. Against this background, most welfare states have undergone major changes, such as increased investment in service infrastructure (Taylor-Gooby 2004). While there is a broad debate on the retrenchment of the welfare state (Levy 2010), in most OECD countries, public social expenditure has been rising for more than thirty years. On average, social spending in these countries rose from 14.5 per cent of GDP in 1980 to a peak value of 20.6 per cent in 2010 after the financial crisis. As economies rebounded in the following years, average expenditure declined slightly to 20 per cent in 2019. In 2019, some countries, such as France, Austria and Norway, spent more than 25 per cent of their GDP on the provision of public social goods and services (OECD 2020).

Public social expenditure encompasses direct support for particular groups in terms of social insurance and social assistance, for example, families, unemployed or elderly, as well as the costs of providing public goods and (social) services. In this paper, social spending is defined across three main areas:

(1) education, mostly regarding the provision of schools and training, (2) health, such as the maintenance of hospitals, and (3) social protection, e.g. cash transfers such as housing subsidies, child support or other kinds of social assistance.

Based on different understandings of the role of the state and municipalities across countries, there are also large differences regarding which administrative level of authority is responsible for providing social services and goods. For instance, historically, Nordic countries, such as Finland, Sweden and Norway, have a larger share of government expenditures centered at the local level compared to other European countries (Sellers and Lidström 2007, Andersson n.d.). In recent years, a tendency of fiscal decentralization could be observed, as authority over certain fiscal competencies, including those connected with social policy, were redistributed from the national to subordinate levels, such as regional and local governments (Oduro 2018). While it is often argued that local governments can provide goods and services for the local population more effectively (see, e.g., Sow and Razafimahefa 2015, Hooghe and Marks 2001), the effect of different levels responsible for public social expenditure on economic equality was so far, given little attention in research.

This paper addresses this gap by taking a closer look at the multi-level nature of social expenditure as well as drivers of regional economic inequality for the case of Austria. More precisely, it analyzes the effects of municipal as well as provincial social public spending on local income inequality while also acknowledging other crucial determinants of local inequality on three spatial dimensions (municipalities, districts and provinces). In short, this paper aims to answer the following two research questions:

- What are the municipal, district-level and provincial characteristics influencing local income inequality?
- What are the contributions of municipal and provincial social public expenditure to the reduction of local income inequality?

Firstly, understanding the drivers of local income inequality on different spatial levels is crucial for policies aimed at the reduction of disparities across municipalities. As Fontes et al. (2010) note, wage differences are affected by the economic structure of the regions individuals live in. This also indicates that besides municipal characteristics, the wider regional context municipalities are embedded in might be crucial to consider. In order to capture the effects of the different spatial levels, variables on three different spatial dimensions are chosen: municipal, district-level and provincial. This allows us to consider the effects of the economic structure of higher administrative levels on local inequality. Secondly, by explicitly accounting for public expenditure on two levels (municipal and provincial), the contribution of the different spending levels on local inequality can be assessed.

The rest of this paper is structured as follows: Section 2 gives a brief overview of the role of public (social) expenditure. In Section 3, the data and descriptive statistics are presented before summarising the methodology in Section 4. Results are given and discussed in Section 5. Section 6 concludes.

2 The role of public (social) expenditure for the reduction of inequality

It is a widely agreed goal of redistributive policies to lower inequalities. Accordingly, an OECD report shows that market income in OECD countries is far more unequal than disposable income, which is the income after taxes and transfers OECD (2011). In Austria, the Gini index for disposable income for the year 2018 was 0.29, while the Gini index for market income was 0.36.

So far, the role of different levels of social fiscal authority (national or subordinate) was given little attention in research. While there is a vast literature on the effects of state-level expenditure on inter-state inequality and municipal expenditure on inter-municipal expenditure, investigations on the relative importance of each level are still rare. An extensive strand of literature concerned with the effects of different levels of government spending on the reduction of inequality has been framed under a fiscal decentralization perspective. While it has been proposed to equalize social spending per capita across territories, critics of this approach have highlighted that a homogeneous approach to social spending could lead to welfare losses (Oates 1999) and reinforce spatial inequalities (Prud'Homme 1995). Proponents of a more centralized approach, however, have pointed toward the problem of political self-interest, reduced economic gains and a potential race to the bottom regarding local budgets (Rodden 2003, Charbit 2011). Furthermore, Glaeser et al. (2009) argue that while cities have the capability to influence income inequality, they mainly do so by generating incentives for richer citizens to leave as they generally favour lower social expenditure and lower taxes. Hence, increasing local social expenditure can reduce inequality but at least partly by decreasing the average income as poorer people, who benefit most from social protection, stay while richer people move away.

Previous studies have shown that province-level expenditure can lower inequality between states in the US (see, e.g., Lee 2021, Moldogaziev et al. 2018). Additionally,

scholars have analyzed the effects of state-level educational expenditure (Kayet and Mondal 2015) and health expenditure (Contarato et al. 2019, Behera and Dash 2018) on inequality and have found that both types of social spending can reduce inequalities. Others focus on the role of municipal spending and hence, argue that the local level is crucial for reducing income inequalities (Lobao et al. 2021, Andreotti and Mingione 2016). Correspondingly, Rodrigues-Silveira (2019) argues that context-sensitive social policies could be more effective than universal approaches on a national or provincial level. Other studies reach similar conclusions (see, e.g., Al-Samarrai and Lewis 2021 for a focus on education spending and Jiménez-Rubio et al. 2010 with a focus on health). There are a few studies that investigate the role of different governance levels in the alleviation of inequality. For example, Kang (2021) finds that in New York - contrarily to national or state expenditure - local spending on education increases graduation rates, which in the long run might reduce inequalities. Contrarily, Xu and Warner (2016) conclude that a more centralist approach in the US might be more efficient in reducing local inequalities since local expenditure patterns vary greatly and are subject to discretion and political will.

Besides public expenditure for social protection, the fiscal strength and the authority of provinces or municipalities to make spending decisions are found to impact intra-regional inequality. Respectively, studies highlight that the regional debt level (Thakur 2022, Abeysingh et al. 2020), limited decision-making power (Deller et al. 2021) and regressive policy designs (Branco and Costa 2019) could potentially reinforce spatial inequalities. Contrarily, other types of spending, e.g. infrastructure (Hooper et al. 2021), might reduce inequality. Lastly, regional funding schemes and sectoral investments could have a hampering effect on local inequality (Ribeiro et al. 2020).

3 Data and Descriptives

Proceeding from the findings presented in Section 2, it can be assumed that inequality within municipalities is influenced by the socio-economic structure of the districts they are nested in. As we are interested in the effects of municipal and provincial public expenditure as well as other economic and demographic variables, a dataset which exploits the spatial dimensions of Austria is utilized. We use data on incomes and wages of all individuals paying taxes in Austria to calculate the local Gini indices. This data stems from the Integrated Wage and Income Tax Statistics provided by Statistics Austria. Household income, comprising wage income as well as income from self-employment and capital, is calculated from disposable income after taxes and transfers and adjusted using the "OECD-modified" scale (OECD 2013). Our main interest lies in the impact of municipal and provincial expenditure on municipal inequality. The 10-year lag of the variables Social expenditure pc and Prov. social expenditure pc is used rather than the respective values for the year 2018 as we assume that the effects of social expenditure materialize with a temporal lag.

Figure 1 shows the distribution of municipal Gini indices for each province3. Burgenland exhibits the lowest mean inequality with a Gini index of 0.259, followed by Upper Austria with a mean Gini index of 0.264. Vorarlberg is the most unequal province, with a mean Gini index of 0.285. Tyrol and Vorarlberg show the highest standard deviation in local inequality, indicating that between-municipalities inequality is specifically high in these two provinces.

Figure 2 shows the log of municipal social expenditure for the year 2008 on the x-axis and the Gini index for the year 2018 on the y-axis[1]. As already visible in Figure 1, Austrian provinces have different municipal Gini index distributions. Municipalities in Burgenland show a rather similar income inequality, while other provinces have a much wider spread in local Gini indices. In Lower Austria and Tyrol, one finds municipalities with a Gini of almost 0.45, while one municipality in Upper Austria has a Gini index just below 0.17. Moreover, the plot visualizes differences in the level of spending on the y-axis. For instance, there is little variation in social expenditure across Carinthian municipalities compared to provinces like Tyrol or Salzburg. It can be seen that the relationship between these two variables is slightly negative in five provinces: Burgenland, Styria, Lower Austria, Tyrol and Salzburg. In the remaining three provinces, the relationship between local income inequality and social expenditure is slightly positive.

While the plot implies some relationship between inequality and public expenditure, further investigation is needed for which a regression framework will be applied.

[1] Vienna is not depicted as social expenditure in Vienna is aggregated to province level. Hence, we exclude Vienna from our analysis.

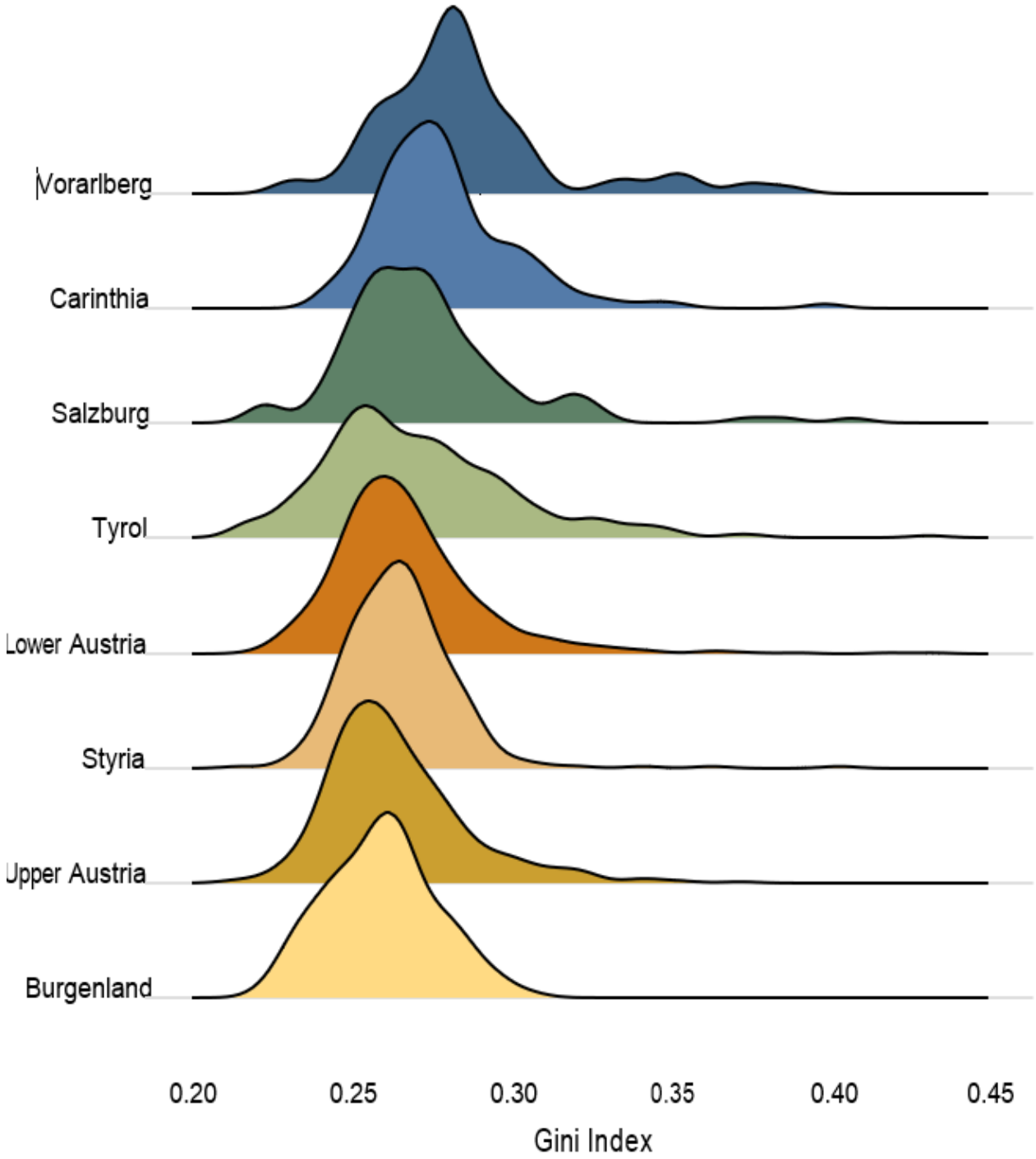

Figure 1: Distribution of municipal Gini indices grouped by province

Note: Vertical lines represent the mean province Gini index.

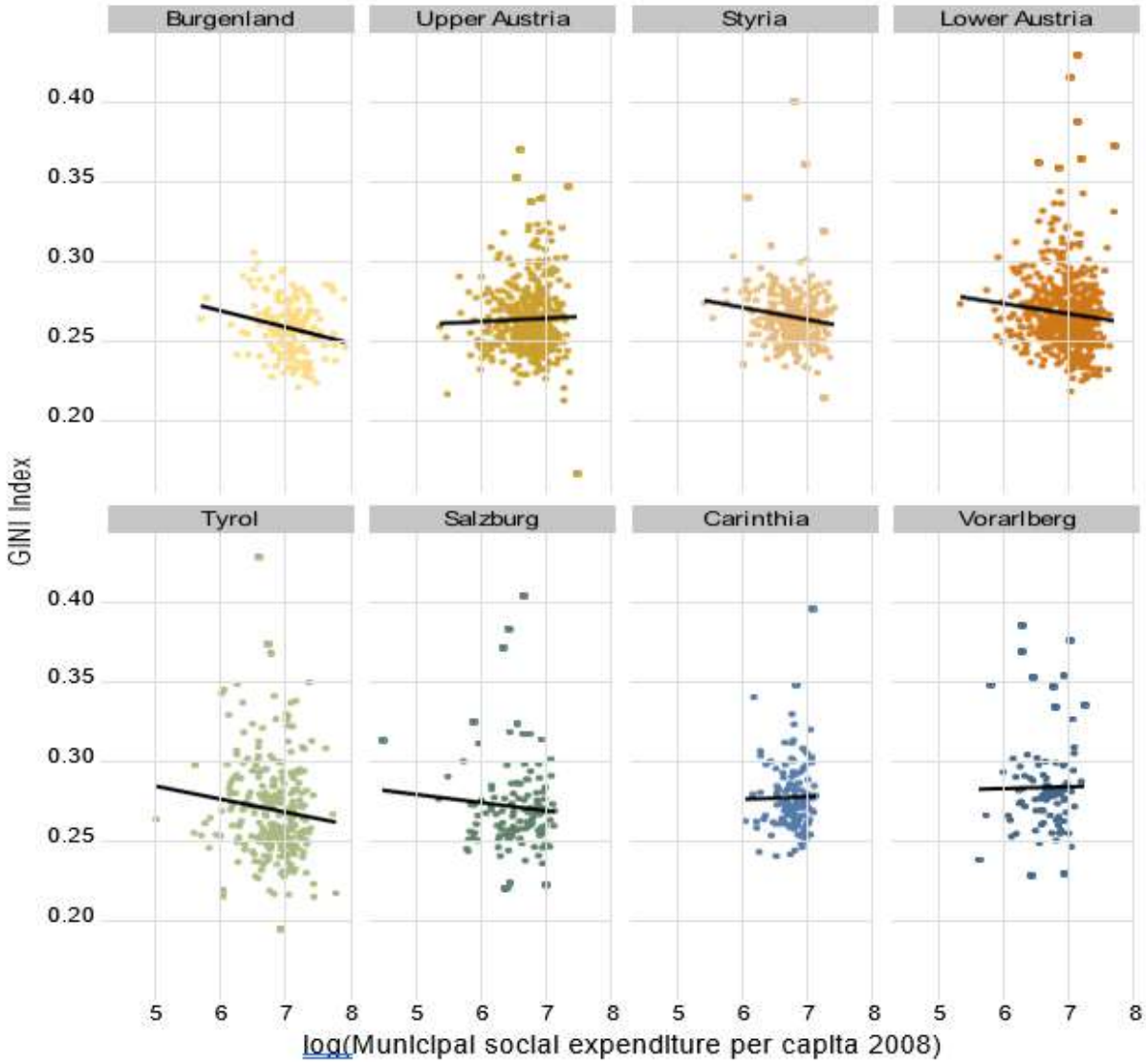

Figure 2: Gini index (2018) and log municipal social expenditure per capita (2008)

4 Methodology

When conducting research on phenomena which are characterized by hierarchical data structures, employing a single-level model might lead to various estimation problems, such as the aggregation bias, misestimated precision and the "unit of analysis" problem (Raudenbush and Bryk 2002). Hence, in this case, scholars suggest the usage of multi-level models, also known as hierarchical models or mixed models. Choosing this kind of model that acknowledges the multi-level structure of the determinants of municipal inequality has two main advantages in the context of this paper. First, relations between the different spatial levels can be analyzed, and the influence of higher-level variables on the dependent variable at the municipal level can be measured. This allows us to estimate the effects of provincial and municipal expenditure on municipal inequality. Second, group effects can be explicitly modelled by calculating within- group and between-group variances. On this basis, we are able to estimate how much of the variation of inequality is due to differences between municipalities and how much is attributable to districts and provinces, respectively.

In order to account for the possible spatial auto-correlation in the data set, we include spatial spillovers in the first level of the model. The combination of spatial econometric models and hierarchical models allows us to include interactions between different municipalities while also acknowledging that data on level-1 are not independent from data on higher spatial levels. Furthermore, spatial econometric models account for externalities caused, for example, by human capital or technological interdependence between observations. We estimate the three-level hierarchical model using the integrated nested Laplaceapproximation (INLA) first proposed by Rue et al. (2009)[2].

[2] Details on the methodology and estimation can be found in the full paper.

5 Results and Discussion

On the municipal level, only Leeway pc, Household size and Number of children have no effect on the local Gini index. Contrarily, labour market-related factors seem to be crucial for explaining income disparities. Accordingly, the local unemployment rate positively affects the Gini index, which is in line with other studies (see, e.g., Saunders 2002, Sen 1997, Ukpere and Slabbert 2009). Although transfers are included in our income definition, unemployment benefits seem to be not high enough to cushion the effect of unemployment on inequality. Hence, as people lose their jobs, they also lose a significant share of their income which leads to an increase in inequality. Additionally, the share of people who are self-employed drives inequality. This can be explained by two phenomena. On the one hand, many people who are self-employed in Austria practise professions that generate little income. On the other hand, self-employment can also lead to a significantly higher income as many jobs that are linked to self-employment fall into the high-skilled sector, such as telecommunication, accounting and legal services.

The share of people working part-time also increases inequality. Since part-time work is most often linked to lower income and we do not account for hours worked, this effect seems reasonable. Yet, this impact could especially be one potential reason for high inequality in certain municipalities as part-time rates are especially high in some Austrian regions. Female employment, however, exerts a negative influence on local income inequality. As more women enter the labour market, household income increases which leads to the convergence of incomes between households. This has also been stressed by several other studies in different contexts (see, e.g., Harkness 2013, Kollmeyer 2013) but also in Austria (Moser and Schnetzer 2017).

Furthermore, a few demographic factors drive local inequality. For example, the dependency ratio affects income disparities positively. This finding is also expected and in line with earlier studies (see, e.g., Lam 1997, Williamson 2001). Although Austria has a low national dependency ratio compared to other European countries, there are vast differences within the country. While the ratio of people outside and within working age is lower in the West and North of Austria, this share is higher in the East and South. The higher the municipal dependency ratio, the fewer people are able to earn money resulting in a lower average household income. Furthermore, the share of single households with children increases inequality. Single households, especially in the presence of children, usually generate lower income than other household types. Therefore, municipalities in which high rates of single households are observed tend to have a lower mean income. Moreover, single parents are more likely to work fewer hours, resulting in lower household income. This finding also emphasizes the arguments made by previous studies that stress the effect of household composition on inequality more generally (see, e.g., Sørensen 2005, Owens 2016, Bover 2010).

Similarly, Population change drives inequality. This indicates that, as more people move to municipalities, income disparities increase and, with it, inequality. To put this into context, especially the South of Austria but also the border regions in Lower Austria have been affected by emigration over the last decade. Many people who move away from, most often, rural municipalities are well-educated and take on jobs in regional centers - the regions with the highest population growth. This potentially results in a decrease in average income in rural areas and eventually in a rise in income disparities in more urbanized areas. This phenomenon is likely to be linked to the impact of average income on inequality. As the mean income in a municipality rises, inequality increases. Our results also indicate that especially regional centers and municipalities that grew over the 10-year period demonstrate higher income inequality. Since the average income tends to be higher in regional centers and regional centers are subject to population growth at least partly caused by the migration of high-skilled people, income inequality is likely to be reinforced in those areas. Contrarily, our findings suggest that rural areas and rural areas close to a center are less unequal than urban or regional centers. These arguments are also underlined by the positive effect that the share of people with tertiary education has on income inequality.

At district level, the share of people employed in the high-skilled sector was found to drive inequality within municipalities. This emphasizes the effect of local drivers of inequality, such as the share of people with tertiary education. Accordingly, the more jobs in high-skilled areas there are within a district, the more people with tertiary education will live in this district, split across the various municipalities nested within this district. The same is true for the number of universities: districts that have one or more universities tend to be more unequal. This is also in line with other results as districts with universities tend to be more urbanized. Furthermore, universities attract firms which rely on high-skilled workers, which again could reinforce income disparities. Lastly, the share of people working in the secondary or tertiary sector negatively affect inequality.

At province level, all variables included in the model have an influence on the Gini index within municipalities. We found that provinces that are governed by the social democratic party exhibit lower local inequality. This also applies to provinces with a higher 10-year lag of per capita social expenditure. Contrarily, higher per capita R&D expenditure, as well as higher gross regional products, positively affect local Gini indices. Regarding the effect of R&D spending, one explanation could be that provinces that spend more on R&D also have a higher density of universities as well as high-skilled workers, which also drive

local inequality. The effect of GRP per capita also fits this line of argument, suggesting that provinces that have a higher GRP per capita also attract more productive firms, which again require high-skilled workers and the respective infrastructure, such as universities or closeness to other firms.

Besides the multi-level determinants of local inequality, one focus of this paper lies on the local effects of social expenditure. Hence, we tested whether the impact of public expenditure differs across provinces and municipalities. Figure 3 shows the mean effects of the 10-year lag of municipal and provincial social expenditure per province. In the solid (upper) part of the bar plot, the effects of provincial social expenditure on municipalities can be seen. In Burgenland, public spending has the strongest negative effect on local inequality (-0.00055), followed by Tyrol (-0.00029) and Lower Austria (-0.00021). This means that for each per cent increase of the 10-year lag of provincial social expenditure in Burgenland, the local inequality is reduced by 0.00055. This effect seems not large but must be put in relation to the generally narrow range of Gini values across Austrian municipalities.

The effects of municipal social spending on inequality, depicted in the dashed part of the bars, are ordered for each province according to their magnitude. Burgenland has, also in this regard, the strongest effects, ranging between-0.00035 and-0.0005. In Salzburg and Upper Austria, strong outliers can be identified. The municipalities Dienten (S) and Mayrhof (UA) have coefficients which are more than one-third higher than those of the other municipalities in their respective province. Contrarily, there are also some municipalities with positive coefficients, for instance, Saalbach-Hinterglemm (S) and Schröcken (V). Theoretically, this would mean that the public spending in

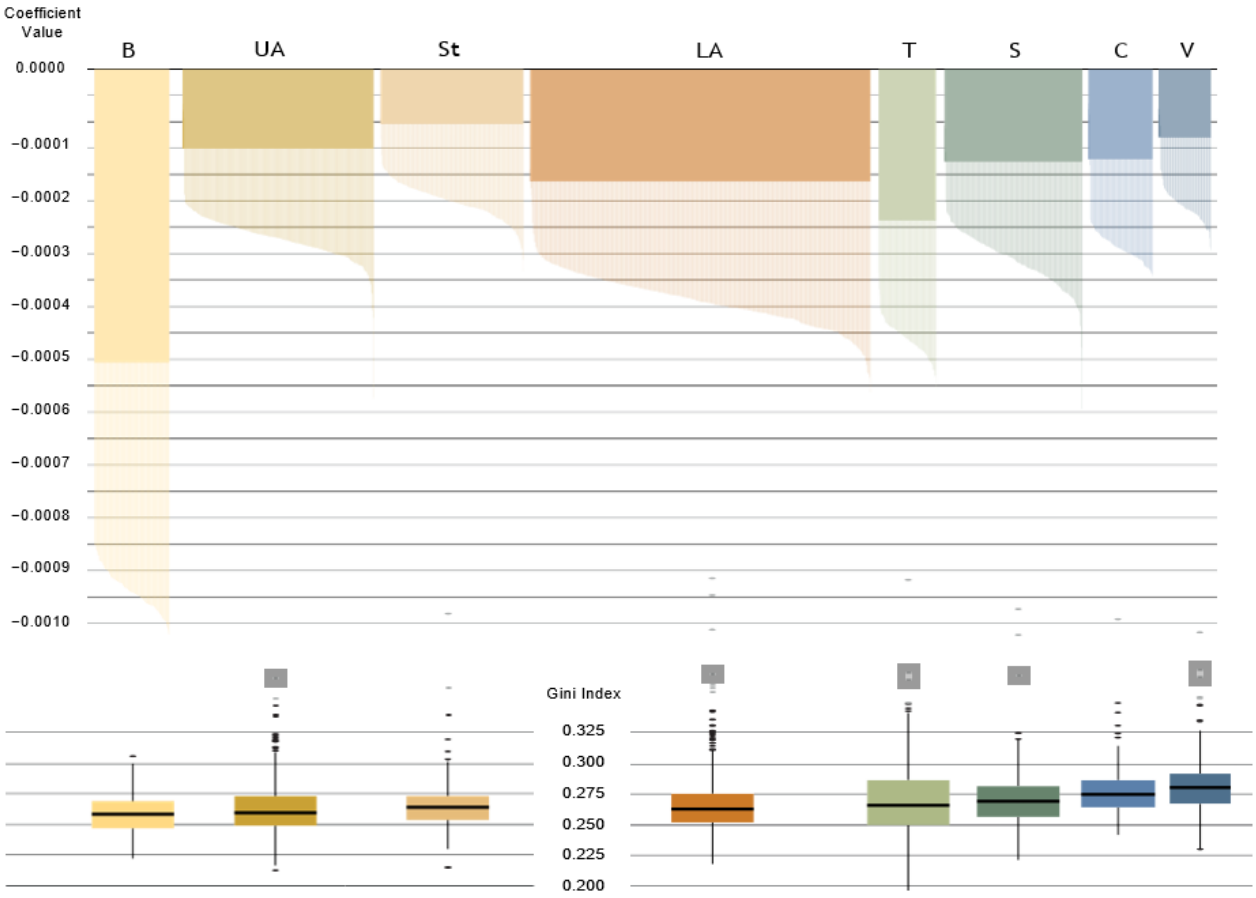

Figure 3: Mean effect of municipal and provincial social expenditure pc and Gini indices for each province

Note: The upper graph shows the coefficients of provincial and municipal social spending on inequality. The solid (upper) part of the bar plot represents the effects of provincial social expenditure on municipalities. The dashed (lower) part depicts the effects of social expenditure of each municipality on its inequality. The bottom graph shows box-plots of the Gini indices grouped by province.

B = Burgenland, UA= Upper Austria, St = Styria, LA = Lower Austria, T = Tyrol, S = Salzburg, C = Carinthia, V = Vorarlberg

these municipalities aggravates inequality. Looking at both bars combined, similarities between the coefficients of municipal and provincial social public expenditure become apparent. Accordingly, the average municipal effect is similar to the respective provincial effect suggesting that the effects of public spending are localized for each province.

The box plots at the bottom of the plot visualize the distribution of municipal Ginis grouped by province. Tyrol has an appreciably larger interquartile range compared to the other provinces. Moreover, the box plots show the presence of upper outliers in most provinces.

The provinces are ordered according to their mean Gini index, from the most equal province (Burgenland) on the left to the most unequal (Vorarlberg) on the right. Interestingly, the highest coefficients (municipal and provincial) can be found in Burgenland- the most equal province - while Vorarlberg exhibits the highest inequality and the lowest coefficients. However, this relationship only holds for the extremes. This argument does not hold for the remaining provinces.

6 Conclusion

This paper found that local income inequality is a phenomenon not only influenced by the economic structure of municipalities but also by the wider regional context municipalities are embedded. As it is one of the main goals of welfare states to decrease economic inequality within territorial borders, research and policymakers must be sensitive to the multiple spatial dimensions on which influential factors, especially social policy, operate. Firstly, this paper analyzed the influence of different municipal, district-level and provincial characteristics on local economic inequality in Austria, and, secondly, it took a closer look at the contribution of public expenditure to reduce income disparities. To account for the nested structure of influencing factors as well as spatial effects between municipalities, we utilized a spatial multilevel model approach.

It was not the aim of this paper to determine the efficiency of public spending nor to argue for the allocation of resources from the municipal to the provincial level or vice versa- as it is part of the centralization or decentralization debate. Rather this paper highlighted the importance of spatial levels when analyzing inequality, as we find significant drivers of local income inequality at the municipal, district-level and provincial level. Correspondingly, our analysis shows that not only municipal factors but also variables in higher administrative units, such as the economic structure, affect local inequality.

For instance, our results show that at the municipal level, higher mean income is associated with higher inequality, while at the provincial level, a rise in GRP increases inequality. Interesting in this regard is Burgenland. The province exhibits the lowest average Gini index and a very low variation in inequality across municipalities. Furthermore, both the average income in most municipalities in this province as well as its provincial GRP are lower than in other regions. Burgenland is at the same time one of Austria's least developed areas and was the only province eligible for an EU Objective 1 program in the funding period 2000-2006, a program designed for regions whose economic development is lower compared to other regions (European Commission 2022). Against this background, it must be cautiously asked whether the achievement of equality itself is a viable goal, as it is not necessarily connected with a general improvement of well-being. Our results suggest that inequality increases not only when parts of the population suffer economically, for instance, as they lose their employment or reduce working hours, but also when people improve their economic situation, e.g. by receiving tertiary education. This stresses the point that to reduce inequality Pareto efficiently (without putting others in a worse-off situation), the focus must be on enabling lower-income households to improve their economic situation. This, for example, is underlined by the effect of increasing female employment on the convergence of incomes between households.

Both social expenditure on a municipal and provincial level have a negative effect on inequality. While government spending directly affects the income distribution by transferring income to the less well-off, the provision of public goods, especially in the field of education and social protection, can also improve the situation of disadvantaged groups. As shown in our analysis, there are large differences between the provinces in how a one percent increase in public spending translates into a reduction of inequality. This might not only be connected to the overall amount of spending but also the efficiency of local systems in utilizing the provided resources.

A limitation of this study is the focus on income instead of wealth, implying that the value of homes, stock, or other possessions is not accounted for. Wealth disparities are known to be more pronounced than income disparities, and Austria is the leading OECD country when it comes to the concentration of wealth at the top of the distribution (the 10% of the wealthiest households hold more than 60% of the net wealth) (OECD 2017). While our analysis covers capital income, e.g. dividends or rental revenue, the effect of property as a long-term asset, protecting against short-term economic shocks and securing the social status of future generations, is not included as specific data is not available. Furthermore, prevailing measures of inequality tend to neglect that costs to cover basic needs differ between regions. Using the approach of residual income, measured as the post-tax disposable household income deducted by costs for necessities, could allow for a better understanding of the locally varying effect of income and, therefore, be a potential area of future research.

References

Abeysingh, Tilak, Ke Mao, and Xuyao Zhang (2020): "Welfare spending and fiscal sustainability: segmented-trend panel-regression analysis of Chinese provinces". In: Journal of the Asia Pacific Economy, pp. 1–21.

Andersson, Markku (n.d.): The role of Local and Regional Authorities in the provision of social services.

Andreotti, Alberta and Enzo Mingione (2016): "Local welfare systems in Europe and the economic crisis". In:

European Urban and Regional Studies 23 (3), pp. 252–266.

Behera, Deepak Kumar and Umakant Dash (2018): "Examining the state level heterogeneity of public health expenditure in India: an empirical evidence from panel data". In: International Journal of Healthcare Technology and Management 17 (1), pp. 75–95.

Bover, Olympia (2010): "Wealth inequality and household structure: US vs. Spain". In: Review of Income and Wealth 56 (2), pp. 259–290.

Branco, Rui and Edna Costa (2019): "The golden age of tax expenditures: Fiscal welfare and inequality in Portugal (1989–2011)". In: New Political Economy 24 (6), pp. 780–797.

Charbit, Claire (2011): "Governance of public policies in decentralised contexts: The multi-level approach". In.

Contarato, Priscilla Caran, Luciana Dias de Lima, and Rodrigo Mendes Leal (2019): "Crisis and federalism: trends and regional patterns of health revenues and expenditures in the brazilian states". In: Ciência & Saúde Coletiva 24, pp. 4415–4426.

Deller, Steven, Craig Maher, and Judith Stallmann (2021): "Do tax and expenditure limitations exacerbate rising income inequality?" In: Economics & Politics 33 (3), pp. 611–643.

Encyclopaedia Britannica (2022): Welfare State. https://www.britannica.com/topic/welfare-state.

European Commission (2022): Objective 1 programme for Burgenland. https://ec.europa.eu/regional_ policy/en/atlas/programmes/2000-2006/austria/objective-1-programme-for-burgenland.

Fontes, Gustavo G, Rodrigo F Simões, and AM Hermeto Camilo De Oliveira (2010): "Urban attributes and wage disparities in Brazil: a multilevel hierarchical model". In: Regional Studies 44 (5), pp. 595–607.

Glaeser, Edward L, Matt Resseger, and Kristina Tobio (2009): "Inequality in cities". In: Journal of Regional Science 49 (4), pp. 617–646.

Grey, Thomas C (1975): "Property and Need: The Welfare State and Theories of Distributive Justice". In: Stan.L. Rev. 28, p. 877.

Harkness, Susan (2013): "Women's employment and household income inequality". In: Income inequality: Economic disparities and the middle class in affluent countries, pp. 207–233.

Hooghe, Liesbet and Gary Marks (2001): "Multi-level governance". In: New York, Rowan and Littlefield.

Hooper, Emma, Sanjay Peters, and Patrick A Pintus (2021): "The impact of infrastructure investments on income inequality: Evidence from US states". In: Economics of Transition and Institutional Change 29 (2), pp. 227–256.

Jiménez-Rubio, Dolores et al. (2010): "Is fiscal decentralization good for your health? Evidence from a panel of OECD countries". In: Health, Econometrics and Data Group Working Paper 10, p. 30.

Kang, Eunju (2021): "Whose money matters in public education: A "public" good that parents purchase". In: Policy Futures in Education, p. 14782103211034348.

Kayet, Mr Aniruddha and Debasish Mondal (2015): "Effects of public school education expenditure on income inequality: Evidence from 15 major States of rural India". In: Scholars Journal of Economics Business and Management 2 (10A), pp. 1021–1031.

Kollmeyer, Christopher (2013): "Family structure, female employment, and national income inequality: A cross-national study of 16 western countries". In: European sociological review 29 (4), pp. 816–827.

Korpi, Walter and Joakim Palme (1998): "The paradox of redistribution and strategies of equality: Welfare state institutions, inequality, and poverty in the Western countries". In: American sociological review, pp. 661–687.

Lam, David (1997): "Demographic variables and income inequality". In: Handbook of population and family economics 1, pp. 1015–1059.

Lee, Hak-Seon (2021): "State expenditures and inequality in the US". In: The Social Science Journal, pp. 1–14. Levy, Jonah D (2010): "Welfare retrenchment". In: The Oxford handbook of the welfare state.

Lobao, Linda, Alexandra Tsvetkova, Gregory Hooks, and Mark Partridge (2021): "Seeing the local state: Poverty and income inequality across the United States during the great recession". In: Sociology of Development 7 (3), pp. 253–284.

Moldogaziev, Tima T, James E Monogan, and Christopher Witko (2018): "Income inequality and the growth of redistributive spending in the United States (US) states: is there a link?" In: Journal of Public Policy 38 (2), pp. 141–163.

Moser, Mathias and Matthias Schnetzer (2017): "The income–inequality nexus in a developed country: Small-scale regional evidence from Austria". In: Regional Studies 51 (3), pp. 454–466.

Oates, Wallace E (1999): "An essay on fiscal federalism". In: Journal of economic literature 37 (3), pp. 1120–1149. Oduro, Kojo (2018): Fiscal decentralization and local finance in developing countries.

OECD (2011): Divided we stand: Why inequality keeps rising. OECD publishing Paris.

— (2013): OECD Framework for Statistics on the Distribution of Household Income, Consumption and Wealth.

— (2017): Understanding the socio-economic divide in Europe.

— (2020): Social Expenditure Database. https://www.oecd.org/social/expenditure.htm.

Owens, Ann (2016): "Inequality in children's contexts: Income segregation of households with and without children". In: American Sociological Review 81 (3), pp. 549–574.

Palme, Joakim (2006): "Welfare states and inequality: Institutional designs and distributive outcome". In:

Research in Social Stratification and Mobility 24 (4), pp. 387–403.

Pickett, Kate E and Richard G Wilkinson (2015): "Income inequality and health: a causal review". In: Social science & medicine 128, pp. 316–326.

Prud'Homme, Remy (1995): "The dangers of decentralization". In: The world bank research observer 10 (2), pp. 201–220.

Raudenbush, Stephen W and Anthony S Bryk (2002): Hierarchical linear models: Applications and data analysis methods. Vol. 1. sage.

Ribeiro, Luiz Carlos De Santana, Renata De Melo Caldas, Kênia Barreiro De Souza, Débora Freire Cardoso, and Edson Paulo Domingues (2020): "Regional funding and regional inequalities in the Brazilian Northeast". In: Regional Science Policy & Practice 12 (1), pp. 43–59.

Rodden, Jonathan (2003): "Reviving Leviathan: fiscal federalism and the growth of government". In: International Organization 57 (4), pp. 695–729.

Rodrigues-Silveira, Rodrigo (2019): "Public policy provision from a subnational perspective: Context, institutions and spatial inequality". In: Regional & Federal Studies 29 (2), pp. 275–294.

Rue, Håvard, Sara Martino, and Nicolas Chopin (2009): "Approximate Bayesian inference for latent Gaussian models by using integrated nested Laplace approximations". In: Journal of the royal statistical society: Series b (statistical methodology) 71 (2), pp. 319–392.

Al-Samarrai, Samer and Blane Lewis (2021): The Role of Intergovernmental Fiscal Transfers in Improving Education Outcomes. World Bank Publications.

Saunders, Peter (2002): "The direct and indirect effects of unemployment on poverty and inequality". In: Australian Journal of Labour Economics 5 (4), pp. 507–529.

Sellers, Jefferey M and Anders Lidström (2007): "Decentralization, local government, and the welfare state". In: Governance 20 (4), pp. 609–632.

Sen, Amartya (1997): "Inequality, unemployment and contemporary Europe". In: Int'l Lab. Rev. 136, p. 155.

Sørensen, AM (2005): "Family structure, gender roles and social inequality". In: Analyzing inequality. Life chances and social mobility in comparative perspective, pp. 108–128.

Sow, Mousse and Mr Ivohasina Fizara Razafimahefa (2015): Fiscal decentralization and the efficiency of public service delivery. International Monetary Fund.

Taylor-Gooby, Peter (2004): New risks, new welfare: the transformation of the European welfare state. OUP Oxford.

Thakur, Sudhir (2022): "Public debt and regional inequality in India: patterns, determinants, and implications".

In: GeoJournal, pp. 1–21.

Ukpere, Wilfred I and Andre D Slabbert (2009): "A relationship between current globalisation, unemployment, inequality and poverty". In: International Journal of Social Economics.

Williamson, Jeffrey G (2001): "Demographic change, economic growth, and inequality". In: Population matters: Demographic change, economic growth, and poverty in the developing world, pp. 106–136.

Xu, Yuanshuo and Mildred E Warner (2016): "Does devolution crowd out development? A spatial analysis of US local government fiscal effort". In: Environment and Planning A 48 (5), pp. 871–890.