

MASTERARBEIT | MASTER'S THESIS

Titel | Title

Austria's fiscal equalization system - Is it capable to reduce disparities?

verfasst von | submitted by

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angestrebter akademischer Grad | in partial fulfilment of the requirements for the degree of

Master of Science (MSc)

Wien, | Vienna, 2025

Studienkennzahl lt. Studienblatt:

UA 066 913

Studienrichtung lt. Studienblatt:

Masterstudium Applied Economics

Betreut von | Supervisor:

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Acknowledgments

I would like to express my sincere gratitude to my supervisor, Ana Ania, for her invaluable feedback, guidance, and support throughout the process of writing this thesis. Her insights and encouragement have been instrumental in shaping this work.

I am also deeply thankful to my friends for their thoughtful advice, careful proofreading, and for sharing countless hours of writing together. Their support made this journey both productive and enjoyable.

Zusammenfassung

Das österreichische Finanzausgleichssystem zielt darauf ab, regionale Ungleichheiten durch die Umverteilung von Ressourcen zwischen Bund, Ländern und Gemeinden zu verringern. Diese Arbeit bewertet seine Effizienz und Gerechtigkeit anhand des von Albouy (2012) entwickelten Rahmens der messbaren Nettofinanzvorteile, Measurable Net Fiscal Benefits (MNFB) auf Englisch. Die Analyse zeigt, dass MNFB mit höheren Einkommen, Bevölkerungswachstum und Bevölkerungsdichte korreliert, aber Transfers oft in wohlhabendere Regionen fließen, was die Gerechtigkeit untergräbt. Haushalte erhalten 0,30 € weniger an fiskalischen Vorteilen für jeden zusätzlich verdienten Euro, wenn sie in produktivere Regionen ziehen. Das System zeigt zwar einige Umverteilungseffekte, wie z. B. Zuschüsse in Verbindung mit Sozialtransfers, aber es verfehlt die Kernziele der Gerechtigkeit und internalisiert keine fiskalischen Externalitäten. Reformen sollten die Zuschüsse wieder auf Regionen mit niedrigerem Einkommen ausrichten und die Anreize an die wirtschaftliche Produktivität anpassen. Die Studie verdeutlicht die Spannung zwischen politischen Verhandlungen und wirtschaftlichen Überlegungen in der föderalen Struktur Österreichs.

Abstract

Austria's fiscal equalization system aims to reduce regional disparities by redistributing resources among federal, state, and municipal governments. This thesis evaluates its efficiency and equity using the Measurable Net Fiscal Benefits (MNFB) framework developed by Albouy (2012). The analysis reveals that MNFB correlates with higher earnings, population growth, and density, but grants often flow to wealthier regions, undermining equity. Households gain €0.30 less in fiscal benefits for every additional euro earned when moving to more productive regions. While the system shows some redistributive effects, such as grants tied to social

transfers, it fails to address core equity goals or internalize fiscal externalities. Reforms should refocus grants on lower-income regions and align incentives with economic productivity. The study highlights the tension between political negotiation and economic rationale in Austria's federal structure.

1 Introduction

Since the mid-20th century, discussions surrounding fiscal federalism and later specifically equalization have been prominent in economic literature, with seminal contributions from scholars such as Buchanan (1950), Tiebout (1956), Musgrave (1959) and Oates (1972). Despite these ongoing debates, the economic disparities between regions within countries persist, influenced by trends such as urbanization and the centralization of economic activities. This is true not only in centralized countries but also in federal systems, where regions are supposed to have more power and independence.

Austria is a good example of how complex federal systems can be in practice. Although it is a federal country, most taxes are collected by the national (federal) government rather than by the states or municipalities. In 2022, only 4.9% of the total tax revenue came from the subnational level, 1.9% from states and 3% from municipalities. Compared to other countries, Austria's system is highly centralized. For example, subnational governments collect 14.8% of tax revenues in Belgium, 48.5% in Canada, 33.7% in Germany, and 41.3% in Switzerland (OECD, 2025a). Because Austrian states raise so little of their own revenue, they rely heavily on the federal government to fund their responsibilities (Krumm, 2015).

The policies for which the states are responsible are described in the fiscal equalization law (in German *Finanzausgleichgesetz*). Under this law, taxes are collected mainly by the federal government and then redistributed to states and municipalities. The goal is to make sure that all levels of government have enough money to cover their tasks, even if they do not raise enough revenue on their own. The numbers reflect this imbalance: In 2022, the federal government was responsible for 69.57% of all public expenditure, while states and municipalities accounted for only 15.54% and 14.89%, respectively (OECD, 2025a). Nonetheless, even though the federal government should endow subnational governments with sufficient means, theoretically it can exert influence on decisions made at other levels through their finances (Bußjäger, 2015). At first glance, that makes for a system that is not entirely decentralized. In the words of Ezcurra and Rodríguez-Pose (2013, p. 389), there is decentralization in

the management dimension, however, without the fiscal means, not in the resource dimension.

Erk (2004) sees the Austrian federation move towards a more unitary structure. He stresses that the lack of social diversity hinders the development of a true federation, contrary to federal societies such as Switzerland, Belgium or Canada where multiple languages are spoken. He considers Austria more as a decentralized administration rather than a federation. Erk builds here on the point of Livingston (1952) who wrote that the essence of federalism lies in society itself, not the institutional or constitutional character of a country. According to Erk, this aspect is what fails in Austria. Nonetheless, as Krumm (2015) already noted and is still the case today, of the federal EU countries, Austria is the most productive when it comes to GDP per capita. Although it may not be a prime example of a federation, it raises a question. Is the Austrian melange a recipe for success?

In Austria, as in many other nations with decentralized governance structures, disparities in regional economic capacities have resulted in uneven public service provision and regional inequalities. To address these disparities, it has implemented fiscal equalization mechanisms as part of its fiscal policy framework. These mechanisms aim to balance the financial resources available to different regions, ensuring that all citizens have access to a comparable level of public services regardless of their location.

The approach typically involves assessing the financial requirements of regional governments to provide a standard level of public services. Based on this assessment, funds are redistributed to ensure that each region has the necessary resources to meet these standards. This system helps mitigate the effects of regional economic imbalances and promotes greater equity in the delivery of public services across the country. Buchanan (1950) already acknowledged that a proper fiscal equalization scheme should mainly benefit the poorer communities since they have fewer financial means available to provide public goods. Such fiscal equalization practices are not unique to Austria and are also observed in other federally structured countries, where they play a crucial role in maintaining regional balance and cohesion (Buettner et al., 2011).

The question for this thesis is about the Austrian fiscal equalization scheme. Especially in times when the Austrian government runs a fiscal deficit, the federal system and its alleged costs are subject to public debate (see e.g. Gebhart, 2025; Tschiderer, 2023). That makes now a perfect time to study the Austrian federal structure from different angles in order for policymakers to take informed decisions in potential reforms. This paper contributes to that by

providing an understanding on households' decisions based on fiscal benefits.

This paper calculates the Measurable Net Fiscal Benefits (MNFB) to find out which regions are attractive to households, based on the model proposed by Albouy (2012). His framework incorporates the fiscal equalization scheme into measurable net fiscal benefits in order to evaluate a country's system regarding both efficiency and equity. The underlying principle here is that equalization grants should not encourage individuals working in highly productive regions to relocate to less productive ones simply to benefit from higher net fiscal benefits. Essentially, if an individual resides in a region where net fiscal benefits exceed the national average, they can access public services at a reduced cost. This means that their overall net income increases more significantly than any changes in their wages would suggest. At the same time, the central government is also motivated by the goal of reducing regional disparities and ensuring that comparable public services are available throughout the country. Albouy argues that efficient transfers should generally ignore differences in local cost-of-living and instead refund higher federal-tax payments caused by higher local wage levels. For an equalization scheme to be efficient, it must also internalize the externalities generated by the provision of local public goods. This requires fiscal benefits to be positively correlated with public goods expenditures. In terms of equity, Albouy uses three measurements, earning potential, realized income adjusted for local costs, and categorical equity (i.e. needs in specific public service areas). For a scheme to improve equity, fiscal benefits should be positive correlated with at least one of those indicators of fiscal need. Applying this model to the Canadian fiscal equalization scheme, Albouy found that the system does not promote efficiency nor equity. Two important case studies applying this model have been done on Bavaria by Lehmann and Wrede (2019) and Brazil by Politi and Mattos (2016). The Bavarian municipal equalization scheme was found to improve equity but at the cost of efficiency. In Brazil, the system performs well on some equity measures but does not achieve efficiency.

This study finds that the MNFB in Austria is correlated to higher predicted earnings, higher population growth and a higher population density. Furthermore, a worker moving to earn €1 more in income, will experience a loss of €0.30 in fiscal benefits. We also found a positive relation between grants and predicted earnings, realized income, population density and local government expenditure. From an equity perspective, the Austrian fiscal equalization scheme does show some redistributive features in form of a positive correlation between federal grants and social transfers adjusted for living costs. However, the labour market composition relationship is opposite to what one would expect. Reforms should aim to redirect grants towards regions with lower earnings capacity, high costs. Households should be incentivized to move to productive regions.

The remainder of this thesis is structured as follows. Chapter 2 will provide an overview of the related literature to the concept of federalism and a discussion on the Austrian federal system including a comparison to Germany and Switzerland. Chapter 3 includes the theoretical framework of the study, followed by the empirical implementation in Chapter 4. Then, Chapter 5 will discuss the results including robustness and limitations before the final conclusions in Chapter 6.

2 The Austrian federal system

This chapter takes a closer look at the Austrian federal system, with a focus on how resources and responsibilities are divided across levels of government. Before diving more deeply into the case Austria, it makes sense to first look at the key ideas and development of fiscal federalism in general. This helps understand why countries may decide to decentralize certain tasks while organising other tasks on the federal level. This chapter starts out with a short overview of the theoretical foundations before looking briefly at Germany and Switzerland and finally moving onto the discussion of Austria.

2.1 Fiscal federalism and measures of decentralization

Before examining Austria's system, it is useful to first understand the development and core principles of fiscal federalism. Classical fiscal federalism builds on the ideas of Tiebout (1956), Musgrave (1959), and Oates (1972). At the basis of fiscal federalism is Tiebout's model of competing jurisdictions, where consumer-voters choose to settle down in the locality whose policies best match their preferences (i.e., the idea of households 'voting with their feet'). He suggested this process would lead to an optimal allocation of households among different jurisdictions. Based on his ideas, Musgrave and Oates were then concerned with the role of different levels of government in a federal system and policy decentralization, also taking into account households might not be completely mobile, but with policy externalities that may spill over across different jurisdictions and different levels of government.

Oates's decentralization theorem is one of the first theoretical treatments, departing from the assumption that "welfare is maximized if each local government provides the Pareto-efficient output for its constituency" (Oates, 1972, p. 36). Considering that not all constituencies have the same preference, the central government is thus unable to provide a Pareto-efficient output. Hence, policies should be made at a lower level of government. The role of the central

government centres around issues for which the preferences of all individuals are similar or those with significant economies of scale, such as defence or economic stabilization.

Furthermore, using efficiency and equity arguments, the central government is also assigned a redistributive role through equalization. Redistribution by the central government can be used to correct for the fact that local governments may choose inefficient policies as they compete for mobile households. For these redistributive purposes, individuals should be treated the same no matter where they live, so that a common national standard applies (see e.g. Boadway and Tremblay, 2012, p. 1065). In this regard, Oates (1972) explains that individuals in poorer jurisdictions effectively pay more tax for the same public goods and services than individuals in richer jurisdictions. Equalization grants are a way to reduce the differences between jurisdictions and make sure that individuals pay the same for the same public services or goods, regardless of where they live.

According to Sorens (2014), however, fiscal federalism could lead to an increase in regional disparities if there are insufficient equalization measures. He draws an example of a low-income region that does not have the ability to raise the same level of taxes as a high-income region and, as a result, lacks the investments in productivity-increasing public services. In Austria, this should be less of a problem, as taxes are mostly harmonized across different regions, implying that tax competition is not a big issue. Even though the differences will concentrate on the expenditure side, there are still regions with less fiscal capacity than others. However, in general, Ezcurra and Rodríguez-Pose (2013) conclude in their cross-country analysis that decentralization in high-income countries leads to lower disparities.

Equalization grants can take the form of horizontal transfers between jurisdictions at the same level or vertical transfers from the central government to lower levels. Vertical intergovernmental grants aim not only to reduce fiscal disparities by accounting for differences in their ability to raise revenues (equity), but also to internalize interjurisdictional spillovers and close vertical fiscal gaps (efficiency). These transfers usually take the form of unconditional grants that help states fund expenditures when their own revenue capacity is insufficient (see e.g. Boadway and Tremblay, 2012, p. 1068).

In Austria, financial equalization (*Finanzausgleich*) organises the fiscal relationships between the different levels of government and is renegotiated every four to six years. The system seeks to reduce disparities in fiscal capacities between the central government, the states and the municipalities. Furthermore, there is an objective of solidarity with the wealthier states receiving less grants than the less affluent ones. A similar system exists on the local level with

the less affluent municipalities receiving more support (Mitterer and Haydn, 2025).

Building on the discussion above, Fedelino (2010) defines decentralization as a transfer of authority and responsibility for public functions away from the central government to sub-national entities. Fiscal decentralization means to also take flows of monetary resources to subnational entities into account. Often, as a measure for fiscal decentralization subnational taxes and subnational expenditures as a percentage of total taxes and expenditures are used, as this number is relatively straightforward to construct (Bröthaler and Getzner, 2010; Fedelino, 2010; Liu et al., 2017; Ngounou et al., 2025; Sekula, 2017; Sepulveda and Martinez-Vazquez, 2011; Siburian, 2022). Nonetheless, that does not mean it is a perfect measure. Austrian sub-national governments in this measurement experience more autonomy in their expenditures than in taxing. However, in some cases subnational governments receive earmarked grants, i.e. the federal government decides the destination of the money. This poses substantial questions to whether a subnational government is truly autonomous.

An interesting paper using these measures is that of Bröthaler and Getzner (2010). The authors use several indicators, such as sub-national revenues (as a percentage of total revenue) and grants from other levels of government (as a percentage of total sub-national revenue), for their analysis to the extent of fiscal decentralization in Austria. By studying the period 1955-2007 they conclude that over time the federal system had a dampening effect on public sector growth. Furthermore, their paper is one of the few that has studied the extent to which fiscal decentralization has economic effects specifically in Austria.

Another way to measure fiscal decentralization is using the Regional Authority Index (RAI) developed by Hooghe et al. (2016). These authors compared a wide range of countries to see how strong subnational governments are on self rule and shared rule. That makes the index very useful for cross-country studies (İrepoğlu Carreras, 2016; Tselios, 2023; Tselios et al., 2012). It is a qualitative index that measures the degree of self rule and shared rule enjoyed by subnational governments. Self rule is defined as the authority subnational governments have over their own affairs. This measure combines capacity to legislate, tax and administer their regions independently from the central government. The other dimension is shared rule. This dimension assesses the authority that regional governments have to participate in national decision-making processes. Shared rule thus reflects the influence of regional governments on policies that affect the country as a whole. For some countries - especially the larger ones or those where the regional authority differs per subnational government - they developed multiple values per country. However, for Austria there is only one generic value, rendering it unsuitable for this study that focuses on differences within Austria. Nonetheless, the RAI does

allow for comparison of Austria with other countries.

2.2 Comparison of federal systems

To better understand the Austrian federalist model, the present section provides a brief overview of the differences between the Austrian federalist structure and that of Switzerland and Germany. Using this comparative framework, it is easier to place into perspective how the Austrian system is structured in comparison to other systems. These two countries are interesting comparisons as they do not only share a common language with Austria, they also provide different models to federalism. As will be discussed here, arguably the German system represents Austria a bit more whereas the Swiss system is often regarded as one of the most federal options available with its highly autonomous cantons. The discussion in this section mainly draws from the chapters written by Bury and Feld (2023) and Schaltegger and Schmid (2023) in the handbook of Tremblay (2023) and the work of Hooghe et al. (2016).

First of all, let us take a look at Austria's largest federal neighbour, Germany. The German Federal Republic (GFR) was founded in 1949 with the merger of three Western occupational zones. The fourth zone, which belonged to the Soviet-Union became its own country, the German Democratic Republic. For this thesis on fiscal federalism, I will focus on the GFR and will refer to this country as Germany or where relevant West-Germany. At its foundation West-Germany consisted of 11 states (*Länder*). Since the fall of the Berlin wall in 1989, the subsequent integration of East-Germany into West-Germany and merger of some states, Germany now counts 16 states.

In Germany, the states are responsible for all fields of politics unless the constitution explicitly assigns responsibility to another level of government. In 2018, 46% of all taxes, the sum of shared, federal and state taxes, were assigned to the federal level. The most important in terms of revenue are the shared taxes, or *Gemeinschaftssteuern*, which include income tax, corporate tax, value-added tax, and flat-rate withholding tax (Bury and Feld, 2023, p. 194). The revenues from these taxes are *shared* between all levels of government. In Germany it is usually the case that the federal government sets the general framework, including the tax base and rate, whereas the states are responsible for the tax collection. In such systems, the states become the executive power of the federal government, but remain very dependent on funding from the higher level. This is similar to Austria. With earmarked grants the federal government can influence what subnational governments spend their money on (Hooghe et

al., 2016; Krumm, 2015).

Redistribution takes place through fiscal equalization (*Finanzausgleich*). Germany has two distinct fiscal equalization systems: a federal scheme that redistributes resources among the federal states, complemented with state-specific municipal schemes that redistribute resources among municipalities within each state. Due to the autonomy of German states, each state designs its own municipal equalization system (Lehmann and Wrede, 2019, p. 130). Thus, it is the responsibility of the states to endow municipalities with the appropriate resources. The division of resources is decided every four years as a result of negotiations between the federal government and the states. The amounts to be redistributed are assigned based on population in the case of income tax and residency in the case of state tax. The prime equalization relies post-2020 heavily on VAT, the division of which is also based on population and financial strength. In that sense, states with a lower financial capacity receive more than states with a higher financial capacity. Since the reform in 2020 the system relies in general more heavily on vertical redistribution instead of horizontal redistribution (Bury and Feld, 2023). Financial resources not only flow to the states, also municipalities can be beneficiaries. Complementarily the lower level of fiscal equalization, that of the individual states, also often has an equity purpose. In Bavaria for example, fiscal equalization is obliged by law to secure equal living conditions across the municipalities within the state of Bavaria. That implies that the states also cater for redistribution from the richer municipalities to the poorer ones, predominantly with unconditional formula-based grants (*Schlüsselzuweisungen*). A second category is conditional grants (*Bedarfszuweisungen*), based on individual municipal needs. Municipalities separately have to apply for these grants. Additional smaller grants exist and are purpose specific (Lehmann and Wrede, 2019, p. 131-132)

We now turn to the description of the Swiss federal system. Switzerland is arguably one of the most federal countries that can be found on the globe. The Swiss Federal Constitution was created in 1848 after a short civil war between the liberals who were more in favour of a centralized state and the conservatives who preferred a canton-dominant state. The constitution was a compromise between the two parties and established Switzerland as a federal republic. Initially, the country consisted of 22 cantons; however, since 1999, Switzerland counts 26 cantons.

Similarly as in Germany, cantons are responsible for tasks that are not explicitly given to the federal level. The main federal taxes are excise taxes, such as VAT. The largest part of the cantonal tax income is direct taxes based on personal income and wealth. This is in line with how the Swiss constitution imposes a system with fiscal autonomy primarily for the cantons

and only afterwards for the federal level (Hooghe et al., 2016). In contrast to Germany, Swiss municipalities are also much more diverse in terms of their fiscal autonomy. The respective cantons decide on the tax autonomy of their municipalities (Schaltegger and Schmid, 2023). The current equalization scheme redistributes around 5.2 billion Swiss Francs between the federal level, high-income cantons and low-income cantons. It is based on cantonal tax potential and standardized over a period of 6 years from income, wealth and profits in relation to taxable income and wealth (Schaltegger and Schmid, 2023, p. 408).

In both countries, we see a trend toward the weakening of the federal system. While Schaltegger and Schmid (2023) warn that Swiss cantons risk being reduced to mere provinces, Bury and Feld (2023) argue that this is already the case for the states in Germany. Following a more globalized and interconnected world, subnational levels have a hard time not only retaining their powers but also remaining relevant in the minds of citizens. As a result, local identities are weakening and citizens feel less connected to their region, detrimental to the notion in which federalism primarily lies in society itself (Livingston, 1952).

In an attempt to not lose relevance, reforms in both Germany and Switzerland have tried to enhance the position of the subnational authorities. In Switzerland, for example, the cantons have set up a Conference of Cantonal Ministers to get them more involved in federal policymaking. Consequently, a critique on this conference is its undemocratic nature, since the forum is not held accountable by e.g. an elected parliament (Schaltegger and Schmid, 2023). This conference is a good example of the strong horizontal federalism present in the country. The cantons coordinate regularly with each other, reflecting the decentralized nature of the federal system. In the more unitary Austrian system, the horizontal aspect of federalism is less pronounced, and the states compete more often with each other than cooperate (Krumm, 2015).

Although Austria, Germany, and Switzerland all operate as federal systems, they differ considerably in the degree of subnational autonomy, especially when it comes to taxation. Swiss cantons enjoy extensive tax-setting powers and often grant similar autonomy to their municipalities. In contrast, German states have much more limited tax authority and rely heavily on transfers from the federal government. This is even more pronounced in Austria, where subnational governments depend to a large extent on centrally allocated funds rather than their own tax revenues (Krumm, 2015).

These institutional differences are also reflected in measures such as the Regional Authority Index (RAI), which captures both self-rule and shared rule. Switzerland scores notably higher

on self-rule, reflecting the strong fiscal and political autonomy of its cantons (Hooghe et al., 2016). Austria and Germany, while somewhat more centralized, have comparatively more developed systems for shared rule, particularly through intergovernmental negotiations and formalized cooperation.

While these comparisons offer useful context, the remainder of this thesis focuses exclusively on the Austrian case. In contrast to the more decentralized Swiss model, Austria's federal structure is shaped by limited subnational tax autonomy and a complex system of fiscal equalization. These features are central to the empirical analysis that follows, which builds on the methodology developed by Albouy (2012).

2.3 The Austrian fiscal equalization system

To understand the Austrian framework, it is first necessary to understand how Austria's fiscal system came to be and how its current structure reflects both historical compromises and institutional path dependencies. After WW1 and the subsequent dissolution of the Austro-Hungarian empire, Austria officially became a federal state on October 1st, 1920, with the federal constitution that came into force that day. The constitution of 1920 was a compromise between the social democrats who were more in favour of centralization and the more federalist Christian social party. The result was a weak federal state, with the most important competencies in the hands of the federal government (Schausberger, 2018). In 1929, the constitution was redefined and that version is the basis of the constitution that was reinstated after WWII and is still in force today (Krumm, 2015, p. 203).

Following is a brief overview of the current federal structure of Austria. Article 2 of the Austrian federal constitution (B-VG §2) defines Austria as a federation made up of nine states (in German *Bundesländer*): Burgenland, Carinthia, Lower Austria, Upper Austria, Salzburg, Styria, Tyrol, Vorarlberg and Vienna. Each federal state is divided into municipalities (in German *Gemeinden*), which are independent economic entities with the right to self-government (B-VG §116). Except for Vienna which is both a state and a municipality at the same time. At the time of writing, there are 2,092 municipalities in Austria.¹ Larger cities such as Vienna and Graz are further divided districts (in German *Bezirke*), whereas on the country side districts stand above the municipal level and consist of multiple municipalities.

¹See municipal structure according to the Austrian Association of Municipalities (accessed 27/03/2025).

In the Austrian system, the federal government is only responsible for affairs to which it has specifically been given authority. The federal government has exclusive authority over areas such as foreign affairs, defence, justice, economic and financial affairs, higher education, the military and the federal police (B-VG §10). Other areas such as education, health care, local infrastructure and cultural affairs fall under the responsibilities of the states and the municipalities or are a shared responsibility of the lower levels with the federal government. The tasks that are to be carried out by municipalities are laid out in state law and hence may differ across states.

The fiscal equalization is a key element of Austria's federal structure and organises the division of financial resources between the federal government, the states, and the municipalities. The fiscal equalization law (*Finanzausgleichgesetz*) pursues both equity and efficiency goals, which are interwoven in the financial distribution mechanism between the federal government, states, and municipalities. It is the result of a negotiation that takes place every four to six years between the different levels of government where they not only decide on the division of shared federal taxes and grants, but also on the more detailed tasks every level has to undertake and how these are financed. This is especially relevant for shared responsibilities. A new local railway in one region may benefit other regions as well and thus warrant financial support from those other regions or from the central government. Furthermore, if new tasks are determined, there also needs to be adequate financing to carry these out. The system is designed in such a way that it ensures comparable living standards across regions through horizontal and vertical equalization (Döring, 2014). The most recent system was decided in 2024 and will remain in place until 2028. As a result of frequent revisions, the current system is described as a complex web of intergovernmental fiscal relationships by Schneider (2002).

Vertical equalization involves equalization between the different levels of government. These are the pure financial relations between the federal government, the states, and the municipalities. As discussed before, over 95% of taxes are collected by the federal government, so it mainly comprises the money flows to the lower levels of government. Around 84% of the euros collected through taxes in Austria are shared federal taxes (*Gemeinschaftliche Bundesabgaben*). The most important ones are taxes on income, on businesses, and VAT. These taxes are divided using a fixed distribution key, where the federal government keeps around 67.9%, the states receive 20.2% and the remaining 11.9% is for the municipalities (Bundesministerium für Finanzen, 2025a) ². Moreover, all levels of government also have their own taxes. A more detailed description can be found as Table A1 in the appendix. In the table, taxes

²The federal finance ministry (*BMF*) provides a comprehensive overview of all the taxes, including allocation keys

are also distinguished between residence-based and source-based taxes. Following the definition of Albouy (2012), residence-based taxes are levied on residents of a certain region, whereas source-based taxes are not necessarily paid by residents of a certain region but stem from economic activity or property.

In general, the purpose of vertical equalization is to ensure that all levels of government have enough money to carry out their duties. Then, there is the concept of horizontal equalization. The purpose of this equalization is to avoid poor municipalities and states falling behind their richer counterparts and to ensure equal development throughout Austria. This is evident in the allocation of funds based on factors such as population size, financial strength, and region-specific needs. An example of this equity goal is the municipal needs-based allocation funds (*Gemeinde-Bedarfszusweisungsmittel*), which provide additional financial assistance to structurally weak municipalities and aim to promote inter-municipal cooperation. The allocation mechanism is based on the needs principle (*Bedarfsprinzip*) (Bröthaler, Getzner, et al., 2011).

On the other hand, the system also considers the principle of fiscal equivalence, where funds are distributed based on where they are earned. The distribution of shared federal taxes also takes into account the origin of the revenue. That means that the system is based on the revenue principle (*Aufkommensprinzip*), linking transfers of resources to economic activity. In Austria, this plays a subordinated role and is mainly in the form of a population-based allocation and the relatively small amount of tax autonomy that subnational governments enjoy (Bröthaler, Getzner, et al., 2011).

Lastly, as elaborated in the fiscal equalization law 2024, there are specific assignments targeted at the financial support of particular sectors. These funds are allocated towards the promotion of public transportation, the construction and maintenance of healthcare facilities, and investments in renewable energy and energy efficiency. In addition, there are provisions for the financial support of regions affected by natural disasters or those with specific infrastructure needs, such as investments in public transportation or healthcare facilities. States also receive resources from future funds (*Zukunftsfonds*) to invest in long-term projects, such as elementary education, housing, and environmental sustainability. These funds are distributed according to population and specific regional priorities (Bröthaler, Getzner, et al., 2011).

The fixed distribution keys to allocate the shared federal taxes are based on a combination of factors. First of all, the size of the population is important. The more populous a region,

the more funds they receive to reflect their greater need for public services and infrastructure. Another factor that plays a role is fiscal capacity. Regions that have limited ability to generate revenue, typically from taxes and other local sources, enjoy additional support to ensure that they can provide essential services. This factor is motivated by an equity consideration, compensating the poorer states and municipalities. Then, the special needs discussed before, also play a role in the distribution. Some regions may, for example, have stronger needs for certain infrastructure projects that warrant a relatively higher share of grants than average. This also includes funds allocated according to regional needs for environmental protection and sustainability, including investments in renewable energy and energy efficiency projects. Arguably, the most important role in deciding on this distribution is fulfilled by historical and political considerations. The negotiations are a political process in which the outcome reflects political compromises and priorities (Bröthaler, Getzner, et al., 2011).

Thus, when following the goal of the Austrian fiscal equalization system, there should be a tendency where states that have lower capacity to raise their own income, but still need funds for public services, are being compensated with a higher share in shared taxes and/or grants. A simple inspection of per capita revenue streams suggests considerable variation across states in their ability to raise own-source income. However, once shared taxes and transfers are included, this inequality diminishes noticeably. This would support the equity objective of the Austrian fiscal equalization system.

An interesting paper that specifically investigated the case of Austrian federalism is that of Bröthaler and Getzner. They tested whether fiscal decentralization contributed to the growth of government expenditures for the period 1955-2007. According to Wagner's law, there is a positive income elasticity of public goods and services, that is, the share of public expenditure in GDP tends to increase in a growing economy. The authors specifically looked into the role of Austria's federal system to see if the law holds in Austria. To measure the size of the government, the authors take the ratio of total government expenditure to GDP. Decentralization is the assignment of power and resources to subnational governments, and both municipalities and states are consolidated in the analysis (Bröthaler and Getzner, 2010, p. 175).

The authors graphically discuss changes in total government expenditure and the subnational share over time. Especially during the oil crisis of the 1970s and the subsequent high level of unemployment, government expenditure increased. After Austria's accession to the EU in 1995; the Maastricht Treaty and the Stability and Growth Pact, in combination with the conservative government's austerity policies, led to a reduction in government expenditure growth. In general, expenditure has increases in the period 1955-2007 and was mainly driven

by running fiscal deficits and thus debt financing instead of taxation. Despite the increase over time in total government expenditure, the share of subnational revenues and expenditures remained relatively stable around 30 to 35% of their respective totals over time. The big change is in how subnational governments receive their funds. Whereas they are now dependent on intergovernmental grants, they used to have more of their own sources.

It was found that, since decentralization in Austria is mainly financed through an increase in earmarked grants allocated for specific standard policies and easy monitoring by the federal government, decentralization has in fact a dampening effect on total government expenditures. The variable measuring the share of grants received to total subnational expenditure was found to be highly significant, supporting the conclusion that binding the subnational use of funds, through increasing earmarked grants, dampens total government growth. This dampening effect is described further as an argument for fiscal decentralization. The combination of local knowledge (the fact that subnational governments can better match the preferences of their citizens with their policies) and centrally monitored earmarked grants looks promising from an efficiency perspective, a point also brought forward by Tselios (2023). Despite being labeled as decentralization, Austria's system works in practice as a form of centralization. The central government has an incentive to strategically cut grants to reduce its own expenditures, whilst the subnational governments are still expected to offer consistent public services. Nonetheless, this is not the entire picture, as Schneider (2002) found that some equalization grants from the federal government to municipalities go well beyond their purpose. In some cases, it was found that not the central government has an incentive to cut grants, but municipalities have an incentive not to promote economic activity in their municipality. By increasing their tax base, they can lose part of their equalization grants. In this line of reasoning, it would not be opportunistic for municipalities to create more opportunities to raise taxes themselves.

Putting the information together, it can be concluded that equalization in Austria is a very complicated system. Part of the tax revenue generated has to be redistributed to the other levels, responsibilities are shared and interests may be conflicting. Over time the system has become more complicated and in the past, suggestions for reform have mainly been focused on simplifying the complex web of transfers (Bröthaler, Getzner, et al., 2011).

3 Theoretical framework

The model developed by Albouy (2012) is novel as it provides the opportunity to combine the twofold goal of financial equalization systems: efficiency and equity. Combining these two objectives seems contradictory. Nonetheless, since both are given as reasons for the design of fiscal equalization systems, there is a need for an economic model that takes into account both of these objectives. The model is based on the basic fiscal federalism framework with heterogeneous households that are mobile across different jurisdictions providing local public goods, but adds to that basic framework differences in regional productivity and quality of life, as well as taxes raised at the federal level. Albouy's results indicate that fiscal equalization can improve efficiency if it accounts for federal-tax differentials caused by the different tax burden on regions with different productivity, and thus earnings, instead of focusing on differences in the cost of living and input costs for providing public services. The analysis supports equalization of source, and not of residence-based revenues. Furthermore, the results imply that equalization grants can satisfy both efficiency and equity, if their redistributive portions are targeted to households' characteristics (e.g. poor households or households with certain needs) and are independent of household location. When he applied this model to Canada's provincial equalization scheme, he found that it was neither efficient nor equitable. This finding raises questions about whether Canada is unique or if other fiscal equalization schemes, especially at lower government levels, face similar issues of inefficiency and unfairness.

Politi and Mattos (2016) apply the same baseline model to Brazil, where fiscal decentralization and intergovernmental grants are crucial in addressing fiscal balances. They estimate the effect of unconditional grants on wages for 26 Brazilian states from 2005 to 2009. Using micro-data from the Pesquisa Nacional por Amostra de Domicílios (PNAD) ³, they decompose wage differentials into composition and location effects. Finbra ⁴ data on federal tax differentials, grant revenues, and population are used to estimate the NFB. The analysis relies on pooled ordinary least-squares regressions with cluster-robust standard errors to explain the relation-

³Brazil's national household sample survey

⁴Braslian statistical agency for public finances

ship between grants and outcomes such as nominal wages, formal wages, price-adjusted income, and population density.

A similar analytical framework is that of Lehmann and Wrede (2019), who look at an equalization system at a lower level of administration, namely the Bavarian municipal equalization scheme. They use county-level data for the years 2004 upto 2011. The purpose of their study is to look at the internalization of fiscal and real externalities, whereas in the Brazilian context Politi and Mattos (2016) are more interested in characteristics of the labour market such as informality and minimum wage, which are less interesting in the Bavarian context.

In a way similar to Lehmann and Wrede (2019) and Politi and Mattos (2016), this paper also provides a case study to test the generalizability of Albouy's results. The case study will be based on Austria and in particular the state-level. The model works in such a way that there is an upper level and a lower level of government. Here, the upper level of government is the federal government, the lower level of government the states. As discussed before, Austria is a particularly interesting case study since the states are very dependent on the transfers they receive from the federal level to carry out their duties, hence transfers play an important role. The remainder of this section provides an informal discussion of Albouy's model.⁵

The model considers a federation with multiple regions and heterogeneous households that are mobile across regions. Households belong to different types, which are characterized by their skills or tastes, and can choose to locate in any region where they live, work, and consume private goods and local public services. Their preferences are represented by a utility function that depends on three goods: a tradable private good, a non-tradable private good, and a non-tradable publicly provided good (public service). Each region is characterized by its productivity in the tradable and non-tradable sectors, productivity in the public sector, and land supply. Final goods are produced using land, labour, and mobile capital. Factor markets and output markets are perfectly competitive, and factors are fully mobile within each region. In Albouy's model wages adjust to compensate differences in the cost of living, public good provision, and quality of life (local amenities). In equilibrium, wages are lower in high-amenity or high-public-service areas, since people are willing to accept less pay to live there. Wages are higher in low-amenity areas, as compensation for lower non-market utility. On the other hand, in high productivity regions, the marginal productivity of labour is higher, so wages are higher. But higher productivity also pushes local prices up, since non-tradable goods become more expensive in rich areas. Therefore, both wages and prices are high, and the ratio of labour input to output prices reflects productivity.

⁵A more detailed mathematical description can be found in Albouy (2012).

Local governments levy linear taxes, including source-based taxes on land and capital, and residence-based taxes on income from wages, land-ownership rents, and interests on capital ownership. These taxes are used to finance the provision of the local public good, which is done efficiently, satisfying the Samuelson condition that equates the marginal rates of transformation to the average marginal rate of substitution between the local public good and the private tradable good. In other words, an efficient allocation of public goods. The federal government also levies taxes and provides transfers or grants to households based on their type and region. These transfers can be positive or negative, representing subsidies or taxes. Furthermore, local government expenditures must equal revenues, and the federal government must also balance its budget.

Efficient transfers are characterized by conditions that ensure households decide to locate where labour productivity is high relative to the resource cost needed to achieve a nationally-fixed level of utility. In that case households are located efficiently if the net output of any type of households is independent of where they are located. Optimal grants should be designed in such a way that they include the public good externality, the federal wage tax differential and the residence based taxes in excess of public expenditure. The public good externality is defined as the externality that members of a certain region receive when a migrant arrives. When assuming non-rivalry of the public good, an extra migrant is an extra source of tax revenue for the local government. With that extra tax income, public expenditure can be increased to the benefit of all in that region. Together, the federal tax differential, the source-based revenue differential, the federal grants differential and the public good externality form the Net Fiscal Benefit (*NFB*). The *NFB* should be location independent to avoid distorting households' location decisions and promote spatial efficiency (see discussion in pp. 826-829 in Albouy, 2012).

Albouy's main theoretical result can be summarized as follows. To prevent inefficient migration and achieve Pareto-efficient spatial allocations, the federal government should design federal transfers taking the following into account. First, high-wage regions pay more federal taxes, while receiving the same federal benefits; this discourages locating in productive areas, which is inefficient, so federal transfers should offset this distortion. Second, source-based taxes such as those on capital or land distort location and should be equalized, while resident-based taxes, if balanced locally against benefits, need no interregional compensation. This residence-based taxes net of local public goods (fiscal residua) average to zero within a region because the extra taxes paid by richer households exactly offset the grants to poorer ones. Third, efficient transfers should internalize the local public-good externalities, compensating migrants for the part of the public good they do not consume which benefits

others. Finally, they should redistribute across household types and not geographically to achieve equity goals like helping the poor or disadvantaged households.

Each of these aspects is now discussed in turn. At first sight, it could seem odd if a region experiences both a negative tax deficit, indicating their higher capacity to earn money, and a positive federal grant differential. Why would a region need to receive more money if it is already home to a relatively high number of high-earners? From an equity perspective, this may seem counterintuitive. One of the main aspects of Albouy's formulation is that optimal grants have clearly differentiated portions aimed at equity and efficiency. In his model, federal taxes encourage workers to locate in low-wage areas because this lowers the burdens without lowering the federal benefits to highly taxed areas. Efficient grants should compensate for these differences among identical households in different regions.

Fiscal federalism highlights the role of source-based taxes (such as business income, sales, or natural resource taxes) because they are tied to economic activity within a region, and can create disparities in fiscal capacity. Wealthier or resource-rich regions may collect more source-based revenues than they need to provide basic services, while poorer or less productive regions may have difficulties in funding comparable public goods. To address these imbalances, fiscal equalization schemes typically redistribute revenues from high-capacity to low-capacity regions. In contrast, residence-based taxes (such as property taxes or personal income taxes) are generally tied more closely to the benefits residents receive from local public services. Thus, these taxes are less likely to distort business location decisions because they are based on where individuals live rather than where economic activities occur. Albouy concludes that optimal grants should focus on correcting disparities from source-based taxes, as these create spatial inefficiencies by distorting incentives for firms and capital to locate in certain jurisdictions. Furthermore, regions with high source-based taxes may lose economic activity to jurisdictions with lower rates, potentially leading to interregional competition and a "race to the bottom," ultimately resulting in suboptimal levels of public service provision.

Residence-based taxes can also vary across regions, but Albouy argues that their distortions can be corrected locally. Since all residents in a jurisdiction benefit from local public goods, residence-based tax burdens can be offset within the region by adjusting taxes and transfers across household types. In equilibrium, fiscal residua (the difference between what a household pays in residence-based taxes and the value of local public goods received) average to zero within a jurisdiction. Therefore, no interregional transfers are needed to correct them. This, however, assumes that local governments maintain a link between tax payments and service levels. In practice, if grants allow local tax rates to fall too low, this link weakens, caus-

ing households to locate inefficiently. Efficiency requires local governments to finance at least part of their public service provision through their own tax base, rather than relying entirely on transfers. In most real-world systems, fiscal rules prevent local taxes from falling to zero.

Now turning to equity, Albouy argues that optimal grants should contain a portion that reach households that need support, regardless of their location. To this aim, he suggests using criteria based on two different measures of income, earnings potential and realized income adjusted for local costs, as well as on other categorical equity aspects. The first criterion discussed looks at the earnings potential of households, that is, taking the capacity they have to earn money. Some households, wherever they are located, are less capable of earning money. Buchanan (1950) calls this an equal treatment of equals. People who are similar in relevant economic aspects should be treated equally by the fiscal system, regardless of their geographic location. Households should move to a place where, with their economic characteristics, they can earn more. A second equity criterion is to look at income that remains after costs of living are deducted. The criterion suggests that households should be considered equal if their incomes, after adjusting for local costs (like living expenses), are the same. This means that if two households have the same income after accounting for the cost of living in their respective areas, they are treated as equals. The first of these two criteria is consistent with the assumption that households are mobile and that observed data reflect equilibrium outcomes. The second criterion, however, may apply out of equilibrium.

Finally, the last equity criterion discussed is “categorical equity,” developed by Tobin (1970). This is related to the idea that, while it is inefficient, it is fair to allocate funds to certain important public services, even in areas where these services are more expensive to provide. This ensures that all communities have access to essential services like schools and sewers, which are considered more fundamental than private consumption items like food, clothing, and shelter. Thus, it is considered categorically equitable when marginal funds are allocated to places where public goods are more expensive to offer. The argument is that in more densely populated regions, it might be cheaper to provide these services due to economies of scale, while in less densely populated or rural areas, providing the same level of services could be more expensive due to higher per capita costs.

Albouy (2012) evaluates Canadian equalization policy based on the theoretical framework outlined above. Since measuring the different components of the NFB at the household level is difficult in practice, he suggests taking an aggregate approach based on average per-capita federal transfers received by each region. Additionally, he distinguishes between the components of the NFB that influence household location decisions, which are easier to measure,

and those that reflect public good externalities or equity considerations, which are harder to quantify. To this aim, he introduces the concept of the Measurable Net Fiscal Benefit (*MNFB*), defined as the per-capita sum of observable fiscal incentives to reside in a region, including federal tax burdens, federal transfers, and source-based local taxes, and excluding the components related to public good externalities and redistributive transfers across household types. The *MNFB* is thus computed using the following three components, all of which are differentials, capturing fiscal advantages or disadvantages relative to a national weighted average:

$$\begin{aligned} MNFB = & \text{Federal grant differential} \\ & + \text{Federal tax deficit} \\ & + \text{Source-based revenue differential} \end{aligned}$$

The first and most straightforwardly observable component of the *MNFB* is the *federal grant differential*, which includes all monetary transfers from the federal government to a region, calculated per capita and compared to the population-weighted national average. A positive value here means that the region receives above-average federal grants per capita primarily from the equalization system. The second component is the *federal tax deficit*, which looks at the taxes that are collected by the upper level of government. The deficit captures how much the federal tax income that originated from a certain state differs from the national average. If a region has above-average wages relative to the national wage of similar workers, its residents pay higher federal income taxes. Lastly, the third component is the *source-based revenue differential*, which accounts for per-capita local tax revenues from source-based taxes and, similarly to the other differentials, calculates how much the per capita value differs from the per capita weighted average in the country. According to Albouy's approach, a tax is considered source-based if it is levied based on the location of the economic activity rather than the residency of the taxpayer. In Chapter 4, there is an overview of what exactly is taken into account for the Austrian case study.

To evaluate equalization policy, the *MNFB* needs to be linked to the components of *NFB* that account for efficiency and equity. Regarding efficiency, in a situation where the local public good is a pure private good (fully rival), there are no externalities and the efficiency criterion of the fiscal equalization scheme imposes that the *MNFB* should equal 0, implying that no region is fiscally more attractive than another after transfers. However, when local public goods are not fully rival, the *MNFB* should be positively correlated with local public expenditures. Public expenditures are used as a proxy for the public good externality. Regarding equity, the *MNFB* should also be positive correlated with indicators of fiscal need, such as earnings potential or the need to finance essential services, as described in the equity criteria discussed above.

According to Albouy (2012), it therefore follows that an optimally designed fiscal equalization scheme can achieve both efficiency and equity. Lehmann and Wrede (2019) and Politi and Mattos (2016), however, conclude that fiscal equalization schemes have problems with efficiency. In Brazil, the areas that contribute more are those with a higher share of formal jobs, which discourages migration to these higher-productivity areas. In Bavaria, Lehmann and Wrede (2019) find a similar lack of efficiency, concluding that local public-good externalities are not properly internalized, leading to suboptimal migration decisions. On equity, both papers show more positive results. The Bavarian scheme redistributes towards regions with lower realized incomes and a larger share of low-productivity residents. Similarly, Politi and Mattos (2016) show that in Brazil, regions with lower real income receive more grants. However, the scheme fails to reach low-income individuals in wealthier areas.

In this regard, an acknowledged limitation of Albouy's model is the fact that it considers federal grants paid out directly to households, whereas in practice central governments transfer to local governments. This complicates the process of addressing specific needs and differences among households. When a single grant is paid per region, the local government may fail to redistribute equitably across different household types and migration distortions may persist.

4 Empirical implementation

4.1 Data

To replicate Albouy’s study for Austria, we will use data provided by the Austrian Statistical Bureau (Statistik Austria, 2025) and the Austrian Ministry of Finance (Bundesministerium für Finanzen, 2025b), where necessary, complemented with financial accounts of individual states. The Austrian Statistical Bureau provides comprehensive information on population demographics, household statistics, labour market composition, educational characteristics, and income data. The Finance Ministry produces detailed reports on taxes and grants. The data spans the years 2017-2022 and includes all nine Austrian states. The euro values are deflated to the base year 2017. Furthermore, the per-capita values are calculated using the population data per state.

Specifically, for grants, the Austrian Statistical Bureau reports on the shares of shared federal taxes, referred to as *Ertragsanteile, gemeinschaftliche Bundesabgaben*, which each state is entitled to, and the net transfers from financial equalization *Transfers im Rahmen des Finanzausgleich*. This study considers the sum of both to incorporate the entirety of fiscal flows entering a state. These data are reported separately for state governments and as a total for all municipalities within each state.

The data for the source-based revenue differential also originate from the Austrian Statistical Bureau. This statistical office collects all information on the fiscal equalization scheme and publishes detailed reports containing this information. For the source-based revenue differential, the relevant sections are the overviews of local taxes, reported separately for the state as an entity *Landesabgaben und Aufteilung nach Bundesländern*, and for all municipalities combined within a state *Gemeindeabgaben und Aufteilung nach Bundesländern*. Although the majority of taxes are collected at the federal level, local levels of government also collect taxes, which will be elaborated on in the subsequent section.

Lastly, the calculation of the federal tax deficit relies on a rich variety of data to separate the composition effect from the location effect in wages. Key data include the composition of the labour market, drawing on the sectoral composition of the labour market and the highest achieved education level of workers. Both datasets are collected by the Statistical Bureau in the microcensus. For the labour market, sectors are divided into agriculture, industry and services, with agriculture serving as the reference sector. Education data is categorized into compulsory school, apprenticeship, intermediate technical and vocational school, academic secondary school, and university and equivalent study. Compulsory school is transformed into lower education; apprenticeship and intermediate technical and vocational school into medium education; and academic secondary, and university and equivalent study into higher education. These levels of education are taken as a share of the total, with lower education set as the reference category. In addition, the share of females in the workforce is derived from the same microcensus. Another component is the commuter index, which is the ratio between workplace commuters at the place of work and workplace commuters at the place of main residence. This serves as a rough indicator of whether the region has more or fewer workplaces than resident workers. The income data for the regression is derived from the integrated income and wage statistic *Integrierte Lohn- und Einkommensteuerstatistik*, which encompasses all income subject to income tax and thus represents the most complete measure available. This is also the dataset from which the transfers differential is calculated. Households can receive social transfers in the form of, for example, unemployment benefits, social security and childcare allowances. A detailed report on social transfers is published by Statistik Austria (2021).

An issue that arises in the Austrian system comes from the status of Vienna, both a state and a municipality at the same time and thus receiving funds both as a state and a municipality. This is the only state in Austria with such a status. The other states only receive funds that can be brought back to their status as a state. Municipalities receive municipal funds from the state in which they are located and they also receive funds from the federal government. To tackle this, we will follow a strategy in line with Lehmann and Wrede (2019), who encountered a similar issue with the different status of independent cities that are both a county and a city at the same time. They took all the fiscal flows into the region coming from the upper levels of government, i.e. the state and the federal levels. The Bavarian counties — their focus of study — have zero to no autonomy to set their own taxes and are dependent on grants coming from higher levels of government and from municipalities. Since grants rarely flow from municipalities to the upper levels of government, only the incoming flows to the region are considered. Municipalities both pay and receive grants. The recipients of these grants are the counties. Therefore, at the county level the incoming and outgoing grants at the municipal

levels are offset.

As there are virtually no fiscal flows from the municipal to the federal level in Austria - only from municipalities to the state (*Länder*) level - any negative net transfers at the municipal level are effectively offset by incoming transfers at the state level. For that reason, we aggregate transfers to municipalities in a given state with those received by the state itself. This includes needs-based allocation (*Bedarfszuweisungen*), which originates at the federal level and is redistributed through the states to municipalities entitled to receive them. In terms of data, this means summing the shares of shared taxes allocated to both the state and its municipalities, along with the state-level transfers received through the fiscal equalization system. This approach is similar to the aggregation method used by Politi and Mattos (2016), who combined municipality data at the state level to carry out their analysis for Brazil. By doing so, we establish the starting conditions necessary to model a two-tier government system with an upper and a lower level.

4.2 Constructing MNFB

Federal grants differential: The federal grants differential for each state is calculated by looking at the difference between the average net grants per capita of a certain state and the average net grants per capita for Austria as a whole. The results are summarised in table 1. On average, the states Burgenland, Styria, Lower Austria and Upper Austria have the lowest federal grants differential, ranging from -€157 to -€282. On the other hand, the states of Vienna, Salzburg, Carinthia, Tyrol and Vorarlberg have a positive federal grants differential, ranging from €114 to €334. Potential reasons for this differences will be explored later in the analysis.

Source-based revenue differential: The next step in reproducing the model for Austria is identifying the source-based revenue differential for each state. The source-based revenue differential is based on taxes that are independent of the residency of taxpayers. These revenues benefit local residents, but are not necessarily paid by them. Crucial to understand is that source-based revenues are taxes that are generated from economic activity or assets in a specific geographical region, regardless of where the taxpayer resides. Albouy (2012) and Lehmann and Wrede (2019) include mainly taxes on corporations and on property. The opposite concept is residence-based taxes, which look at where the taxpayers reside instead of

Table 1: Measurable net fiscal benefit (MNFB)

State	Federal grants differential	Federal tax deficit	Source-based revenue differential	MNFB
Salzburg	243.63	254.09	21.33	519.05
Vienna	334.26	51.19	130.08	515.53
Vorarlberg	216.00	79.42	-0.38	295.05
Carinthia	114.49	76.01	-43.58	146.92
Upper Austria	-156.98	-53.85	-26.67	-237.50
Burgenland	-252.82	168.71	-208.83	-292.94
Styria	-211.72	-53.46	-48.69	-313.87
Lower Austria	-283.32	21.19	-89.87	-351.99
Tyrol	162.16	-637.40	101.35	-373.88

the location where the economic activity takes place.

The Austrian Statistical Bureau provides a comprehensive overview of all taxes levied by local governments. To calculate the source based revenue differential, there are two strategies; namely adding up all taxes that are exclusively source-based or subtracting all taxes that are exclusively residence-based from the total amount of taxes. As some states levy taxes that other states do not, the cleaner strategy to follow here would be to subtract all taxes that are explicitly residence-based.

Table A1 provides an overview of the most relevant taxes in Austria, the level of government by which they are levied and the type. Taking into consideration the taxes that are levied by the subnational governments, we will again compile all the municipalities in a certain state and add the value of the municipal tax income to the total tax income of the state. For the analysis we exclude the following taxes:

- Wohnbauförderungsbeitrag
- Abgaben für das Halten von Tieren
- Verwaltungsabgaben
- Seuchenvorsorgeabgabe
- Gebühren für die Benutzung von Gemeindeeinrichtungen und -anlagen

The largest contributors to source-based tax revenues at the local level are property taxes (*Grundsteuer A & B*), tourist taxes (*Fremdenverkehrsabgaben*) and local business taxes (*Kommunalsteuer*), which is the most significant of the three. The local business tax is a fixed rate of 3% of total wage costs for local business, the same everywhere in Austria. The other tax rates may differ depending on the region.

Especially in Vienna, the local business tax is a great contributor to the source-based revenues of the city. Furthermore, since the city also has source-based taxes that do not exist elsewhere, such as the employer tax (*Dienstgeberabgabe*), the source-based revenue differential is higher than elsewhere.

Revenue data is compiled and then used to calculate the source-based revenue differentials per capita, which are summarized in Table 1. The source-based revenue differential is lowest for Burgenland at -€215.06 and highest for Salzburg at €131.64. Since these taxes are source-based and not residence-based, resident households benefit from the contribution of these taxes to the financial strength of their municipality or state without necessarily facing the extra burden. Thus, households would be attracted to move to states where the source-based revenue differential is highest. In this case, Salzburg has the highest differential, which implies that local governments have more fiscal capacity to spend on local public goods. Households should be attracted to move to these regions. In general, we see more or less a picture in which the richer states have a higher source-based revenue differential, a finding similar to Lehmann and Wrede (2019). Furthermore, the states that receive more tourists every year, such as Tyrol and Salzburg report relatively high source-based revenue differentials.

Federal tax deficit: Albouy (2012) defines the federal tax deficit as how much less an individual pays in federal taxes relative to the national average due to location-specific wage differences. A high deficit in a certain region means that wages are lower and thus less taxes are paid compared to the federal average. In an optimal situation, individuals would move to regions with a tax deficit to avoid the high tax burden of regions with a negative tax deficit.

To quantify these effects, we decompose average wages in each region into two components: one explained by observable worker characteristics (*the composition effect*) and another reflecting region-specific advantages or disadvantages (*the location effect*). Following Albouy, we estimate the following model:

$$\log(w_{j,t}) = \alpha + (X_{j,t} - \bar{X})\beta + \varepsilon_{j,t} \quad (4.1)$$

where $\log(w_{j,t})$ is the log average wage, $X_{j,t}$ is a vector of observable characteristics of the workforce in region j and year t , $\bar{X}$ denotes the population-weighted average of these characteristics across all regions and years, β represents the associated coefficients, and $\varepsilon_{j,t}$ is the error term. By centring the regressors, the intercept α captures the national average log wage, while the composition effect $(X_{j,t} - \bar{X})\beta$ measures the wage variation due to differences in

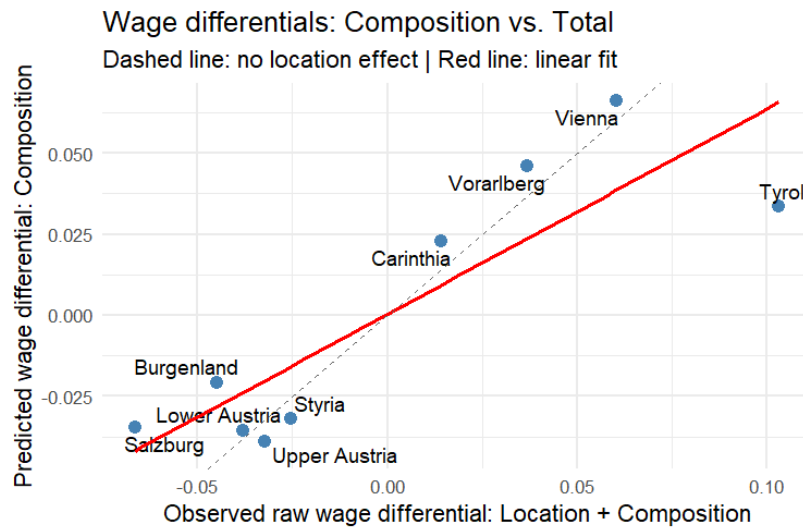


Figure 1: Wage levels across states

workforce composition, which we call the composition effect. The residual wage variation after accounting for composition is interpreted as the location effect, reflecting region-specific wage premiums or discounts.

The workforce characteristics include the education level, where compulsory school is set as a reference; sector, with agriculture set as reference category; and other variables such as share of migrants, share of female workers, and commuters. Using the same procedure as Albouy (2012), the components that make up the wage equations are normalized to have a national mean of zero.

The first step is to estimate β using a pooled OLS regression of log wages on centered workforce characteristics. This gives a clean estimate of how deviations from the Austrian national average in education, industry structure and workforce characteristics play a role in wages. The composition effect for each region and year is computed as the product of these centered characteristics and the estimated coefficients, i.e. $(X_{j,t} - \bar{X})\hat{\beta}$. The residual, the difference between the observed log wage and the estimated value, is then the location effect. The location effect reflects a premium for living in certain locations after accounting for observable characteristics.

Figure 1 plots the composition effects (y axis) against the raw wage differentials (x axis). The diagonal line (45 degree line) indicates where wages are fully explained by composition, that is, there is no location premium. The distance from each point to this line reflects the location effect. Tyrol lies all the way to the east of the figure, indicating a high location premium.

Workers in states that lie below the diagonal have a higher wage than is predicted based on the composition of the workforce. States such as Salzburg, those that lie above the diagonal, offer lower wages than what can be predicted using the observable characteristics. Wages in states that lie on or close to the diagonal such as Lower Austria, Upper Austria and Vienna more or less reflect the observable characteristics of the workforce. The regression line (slope = 0.635, standard error = 0.137) shows a positive association between worker composition and wage levels, suggesting that higher-skilled workers tend to live in higher-wage regions.

We take the taxable wages and apply the average tax rate that the average Austrian worker pays, that is, 32.3% to calculate the federal tax deficit (OECD, 2025b). We could also apply the individual tax brackets of the Austrian system; in that case, as a result of the progressive system, the differentials would be a little inflated. Following the strategy in the literature, we use the median flat tax rate as a conservative estimated (on this see Albouy, 2012, Footnote 21). The tax deficit tells us how much more (or less) in federal income tax a region pays due to its location wage premium.

As can be expected, regions with the highest predicted wages also experience the highest tax burden. Nevertheless, we are interested in the federal tax deficit. That is highest for those states with the highest location premium. The federal tax deficit column in table 1 can be interpreted as the average per person gain or loss related to location-based premiums. Tyrol stands out as a region with a high federal tax deficit resulting from its positive location effect.

MNFB We now have enough data available to construct the MNFB, the result of which is shown in Table 1. The last column in the table is the sum of the three columns before. Figure 2 plots the relationship between the federal grant differential, on the one hand, and the sum of the source-based revenue differential and the federal tax deficit on the other. The dashed line denotes the level of grants necessary to offset the source-based revenue differential and the federal tax deficit. The distance between the dashed line and the observation points of the states equals their MNFB. Carinthia lies closest to this line, with the MNFB in that states of €147 being closest to 0. The red regression line is positive sloping, which means that as the sum of source-based tax revenues and federal tax deficits increases, the federal grants also increase. In other words, regions with higher combined source-based tax revenues and tax deficits tend to receive higher fiscal grants. States towards the right of the dashed line have positive net fiscal benefits, those left of the dashed line have negative fiscal benefits.

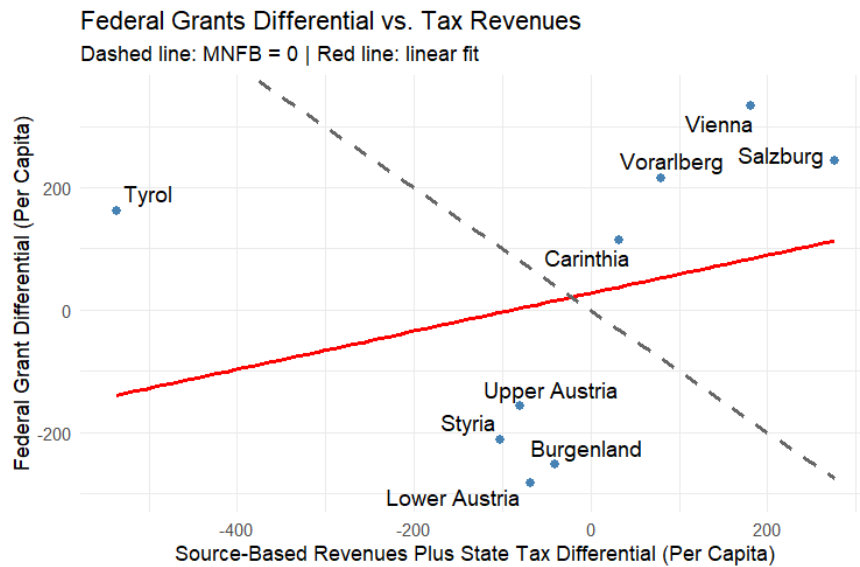


Figure 2: Per capita federal grants relative to federal taxes and source-based revenue in 2017 euros

The positive regression line is a finding similar to Albouy (2012), Lehmann and Wrede (2019), and Politi and Mattos (2016). Upon diving a bit deeper into where these differences in fiscal benefits of Austrian states stem from, it is especially the federal grants differential that is driving up the magnitudes for the MNFB. This is similar to Brazil and Canada but different from Bavaria where the state tax deficit is inflating the magnitudes.

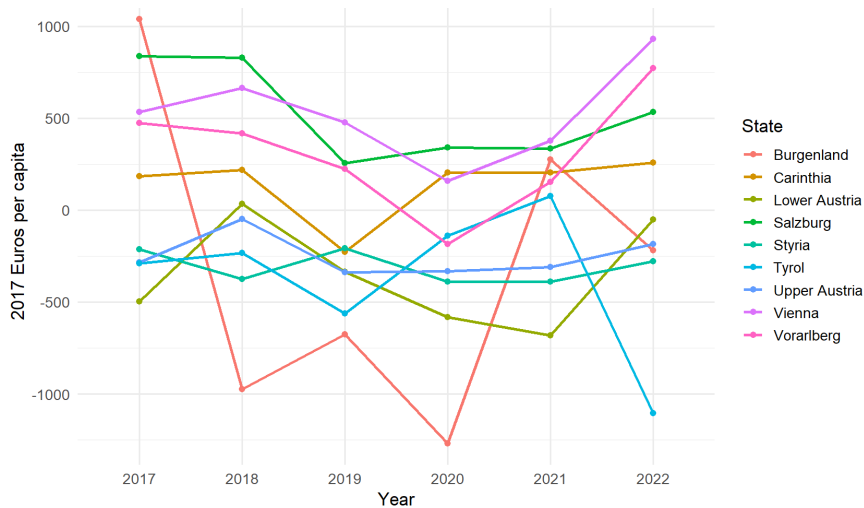


Figure 3: Net Fiscal Benefits over time

Figure 3 plots the development of fiscal benefits over time. As can be seen, there are large fluctuations between 2017 and 2022, especially Burgenland stands out as a region where benefits go from positive to negative and back to positive in this period of time. Other states show a more stable pattern.

5 Results

The models used in this paper are pooled OLS, as we are interested in cross-sectional variation between states. In this section the tables are structured the same and can be read column by column. Table 2 shows the measurements of the various efficiency and equity characteristics relevant to this study. As reported before, the differences in measurable net fiscal benefits in Austria may be explained by these variables. States are diverse, and this diversity may warrant differences in MNFBs. Table 3 looks at the correlation between selected measures and the federal grants differential. Table 4 takes the MNFB as point of study.

Table 2: Relationship between federal grants and MNFBs with efficiency and equity criteria

State	Location Premium (euros)	Predicted earnings from labour market composition	Social transfers differential	Realized income adj. for cost of living	Population Growth (%) 2003-2023	Population density (per km ²)	Municipal and state public expenditures
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Burgenland	-522.33	-531.70	-263.67	-2823.94	9.05	74.85	-1609.53
Carinthia	-235.32	629.18	1.42	35.30	1.93	59.15	-13.94
Lower Austria	-65.62	-870.61	-142.21	-1492.11	10.83	88.36	71.17
Salzburg	-786.65	-835.02	-244.63	-1206.30	10.04	78.37	738.21
Styria	165.52	-794.48	-189.41	-673.41	6.46	76.31	-136.69
Tyrol	1973.37	1003.10	59.16	2311.37	13.63	60.18	1101.84
Upper Austria	166.73	-957.75	-26.61	-1437.68	10.23	125.14	-745.47
Vienna	-158.48	1907.46	93.59	991.34	24.50	4650.13	165.45
Vorarlberg	-245.89	1275.67	134.77	691.50	14.84	153.64	205.62

Table 3: Summary of Pooled OLS Regressions on Federal Grants Differential

	Location premium	Predicted earnings from labour market composition	Social transfers differential	Realized income adj. for cost of living	Population growth 2003-2023	Population density (per km ²)	Municipal and state public expenditures
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Coefficient	0.006	0.144***	0.620*	0.078**	19.481*	0.078***	0.155***
Std. Error	(0.023)	(0.035)	(0.314)	(0.024)	(9.479)	(0.017)	(0.023)
Adj. R^2	-0.018	0.467	0.186	0.327	0.232	0.220	0.330

* significant at 10% ** significant at 5% *** significant at 1%

Table 4: Summary of Pooled OLS Regressions on Measurable Net Fiscal Benefits

	Location premium	Predicted earnings from labour market composition	Social transfers differential	Realized income adj. for cost of living	Population growth 2003-2023	Population density (per km ²)	Municipal and state public expenditures
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Coefficient	-0.300***	0.188***	0.203	-0.049	24.958**	0.134***	0.133*
Std. Error	(0.033)	(0.088)	(0.644)	(0.059)	(15.845)	(0.026)	(0.110)
Adj. R^2	0.594	0.165	-0.014	0.011	0.069	0.130	0.039

* significant at 10% ** significant at 5% *** significant at 1%

Column 1 reports the location premium, which refers to the additional compensation or financial benefit that individuals or entities receive due to their geographic location. This premium can be positive or negative depending on various factors such as cost of living, demand for labour, quality of life, and regional economic conditions. A higher location premium, as presented in 2, implies that households in a certain region pay higher than average taxes. This leads to tax deficits and, in turn lower net fiscal benefits. Conversely, a negative location premium indicates that a location may have less desirable attributes, resulting in reduced financial benefits. The significance of the location premium is determined by its p-value in the regression analysis, with a p-value less than 0.05 typically indicating a statistically significant impact on the dependent variable. Table 3, shows there is no statistically significant relationship between the location premium and the federal grants differential. However in Table 4 the relationship between the MNFB and location premium is statistically significant. A household moving to a region to earn €1 more, will lose €0.30 in fiscal benefits. The net gain of moving is hence €0.70.

The following columns relate to equity. The first equity criterion to be discussed here is that of earnings potential. For the system to promote equity, the relationship between the federal grants and MNFB on the one side and predicted earnings on the other side should be negative.

In our data, with a statistically significant positive relationship in both tables, that criterion is not satisfied. Instead, it shows an opposite relationship to what one would expect taking into consideration equity.

Secondly, an equity measure that goes beyond what Albouy (2012) considered is looking at the value of social transfers in column 3. Some regions may have more social policies in place that aim to tackle poverty. A reasonable expectation is that the social transfer differential is positively correlated with the grant differential and net fiscal benefits. Burgenland and Salzburg have the lowest transfers per capita, whereas Vienna and Vorarlberg offer the highest amount of transfers per capita. The transfer differential is marginally positively correlated with the federal grants differential; however, it is not correlated with the MNFB.

Another equity measurement used in the literature is the realized income adjusted for costs of living. This goes beyond merely looking at income and also takes into account the costs that households face for life. Income is adjusted for living costs, as that takes up a large portion of households' income. The regional price index is based on the rent price per m² in a state in a certain year compared to the Austrian average. Again, the correlation with the federal grants differential is positive and statistically significant, whereas no statistically significant relation was found between the realized income and net fiscal benefits. So, federal grants seem to work in a direction where those in regions with higher realized income also enjoy higher grants per capita. This is also contrary to what would be expected for equity.

Interestingly, while a 1% increase in the population growth rate is associated with €25 higher net fiscal benefits, the relation with federal grants is not significant. Equalization policies seem to encourage households to move to regions with higher growth rates. Moreover, the correlation between the population growth rate and realized income adjusted for costs of living is 0.363 suggesting a moderate positive relationship between growing regions and more productive regions. In contrast Albouy (2012) found that in Canada there is a negative relationship, households move to regions with lower productivity. Thus, the Austrian equalization scheme reflects a closer alignment to spatial efficiency as more productive regions are experiencing higher population growth.

Population density in column 6 is related to what Albouy (2012) and Lehmann and Wrede (2019) call categorical equity. Their point is that in some less densely regions it is more expensive to provide basic services such as sewage and schools than in others; thus warranting more grants and/or net fiscal benefits. It is found that both the federal grants differential and MNFB is correlated positively with population density. The less densely populated areas thus

receive less. This is opposite to findings in Canada, Brazil and Bavaria and opposite to the literature's understanding of categorical equity. Nonetheless, it is important to note the topographical difference between these countries. Canada and Brazil are larger countries than Austria and have much lower population density levels. It could be the case that in Austria it is in fact more expensive to provide basic public amenities in more densely populated areas. That would, however, not explain the difference compared to Bavaria.

The last criterion, presented in column 7, is related to efficiency. As discussed above, an efficient fiscal scheme manages to internalize externalities. Here, local expenditures per capita, i.e. municipal and state, should be related positively to the net fiscal benefits. Local expenditure per capita is again statistically significantly positively correlated with the federal grant differential, but not with the MNFB. This suggests that although higher-spending regions receive more transfers, these do not translate into higher net benefits for households. As a result, the system fails to offset the tax burden or incentivize efficient migration to regions with greater public service provision.

An interesting note can also be made on the magnitude of the estimated coefficients. Out of all differentials, the social transfers differential in Table 3 is the highest. However, this coefficient not adjusted for costs of living and may thus overestimate the actual impact on equity. The marginally positive correlation with transfers further complicates the interpretation. Although higher transfers may initially appear to promote equity, their impact must be evaluated in the context of overall fiscal policy and regional economic conditions. If regions receiving higher transfers also face higher living costs, the net effect on equity may be less straightforward. In that case, the higher transfers may only account for the higher living costs, not for an actual higher number of needy households. This nuanced effect is further supported by the lack of a statistically significant relationship between MNFB and the transfer differential.

Furthermore, when looking at the labour market composition effect, at first glance, a strong composition premium might seem to conflict with equity goals, since it implies that regions with higher earnings potential receive more grants. However, this interpretation changes when considering the broader economic context. The smaller coefficient in column 4 for realized income suggests that after accounting for living costs, the relationship between income and federal grants becomes more moderate. This adjustment reveals the true purchasing power and economic conditions facing residents, offering a clearer view of economic equity.

Table 5: Robustness Check: Summary of Pooled OLS Regressions on Adjusted Transfers Differential

	Federal Grants Differential	MNFB
Coefficient	0.619**	0.270
Std_Error	(0.232)	(0.490)

* significant at 10% ** significant at 5% *** significant at 1%

Following the example of Albouy (2012) and Politi and Mattos (2016), it is insightful to delve deeper into the composition effect to explore the compositional factors and understand the source of the conflicting effects. Taking an equity perspective, one would expect federal grants to be directed to those regions with more lower educated people and away from regions with more highly educated citizens. In fact, Table A2 shows that although the variable federal grants and medium educated are negatively correlated, the relationship between federal grants and higher education is positive. Similarly, with economic status one would expect grants to be directed to regions with lower economic status, i.e. away from regions with a strong services sector. However, there is no significant relationship between these variables. Looking at the measurable net fiscal benefits in Table A3, the same relationship emerges with an even more extreme effect. The fiscal benefit from grants and source-based taxes outweighs the extra tax burden. In case of sectoral competitions, when industrial regions and service sector dominated have a similar economic development, one could argue that it makes sense that there is no statistically significant relationship with either of the two. In that case, grants and fiscal benefits work in an equitable way. The counter-intuitive relationships for education cannot be explained from an equity perspective.

5.1 Robustness

To ensure robustness of the model, all the variables are deflated to the 2017 euro-value and cluster robust standard errors are used in the analysis, as reported in Tables 3 and 4. Since the data are of the cross-sectional type, it is necessary to adjust for the correlation within the clusters, here states (Abadie et al., 2022). Otherwise, the standard errors would be erroneously low.

Furthermore, we can check the model for the transfer differential adjusted for costs of living. The robustness check, as shown in Table 5, examines the impact of the adjusted transfers

differential on both the federal grants differential and measurable net fiscal benefits. The coefficient for the adjusted transfers differential in the federal grants differential model is 0.619 with a cluster robust standard error of 0.232, and is now statistically significant. This indicates a strong positive relationship, suggesting that when transfers are adjusted for cost of living, they significantly influence the federal grants differential. In contrast, the coefficient for the adjusted transfers differential in the MNFB model is 0.270 with a cluster robust standard error of 0.490 and is not statistically significant. This lack of significance implies that the adjusted transfers differential does not have a robust impact on MNFBs. Therefore, while the federal grants differential is sensitive to changes in the adjusted transfers differential, MNFBs are not significantly affected by this variable. This check helps understand the original model's findings regarding social transfers when adjusting these for costs of living.

5.2 Discussion

Taken together, the findings present a complex picture of Austria's fiscal equalization system. While there are signs that the system aims to reduce disparities between states, several outcomes are in conflict with the core equity goals it proclaims to support. States with higher predicted earnings, higher realized incomes, and greater population densities tend to receive more in grants, even though these are typically indicators of stronger economic capacity. The raw differential in social transfers is not significantly related to either federal grants or measurable net fiscal benefits; however, when adjusted for cost of living, a positive relationship does emerge. This points to a limited but important equity channel operating through cost-sensitive redistribution. At the same time, the lack of support for less densely populated regions contradicts the principle of categorical equity seen in other countries' systems.

On the efficiency side, while public expenditure is positively associated with grants, this does not translate into measurably higher net fiscal benefits for residents, suggesting a disconnect between funding and household-level impact. Altogether, these patterns hint at a system shaped not only by economic rationale, but also by political compromise, historical arrangements, and possibly institutional inertia. This is a finding similar to the literature. Rather than correcting regional imbalances, the system may partially entrench them, raising questions about whether redistribution mechanisms meaningfully align with their stated efficiency and equity objectives.

5.3 Limitations

Before concluding, this section points out some limitations of this thesis. First, the analysis is constrained by the availability and quality of the local data. Since the model needs an upper and a lower level of government, this paper aggregated municipal data to their respective states. One could also decide to study the municipalities individually to avoid drawing conclusions only for states in general. The states in Austria are quite diverse, and more detailed data could provide better insight into the efficiency and equity impacts of the fiscal equalization scheme. That way one could understand difference between more rural and urban areas, also allowing to study cities in other states than Vienna.

Furthermore, the analysis assumes certain patterns of labour mobility and responses to fiscal incentives, which may not fully reflect the complex realities of migration and labour market behaviour in Austria. These assumptions simplify the analysis, but can limit the applicability of the findings. That is connected to another limitation that should be mentioned here, namely that there may be other motivations for households to move to a certain state that are not captured in the model. A household might have a large social circle somewhere which makes the state more attractive to live in than any type of fiscal benefit. In addition, states may also provide other incentives to convince households to move there.

A related concern has to do with the largely static nature of the model. Although the analysis takes into account multiple years, the Albouy framework assumes that households have already responded to fiscal incentives and a long-run spatial equilibrium has already been reached. The model may overstate or misrepresent the efficiency aspect if households have not yet responded. Migration responses are slow and other factors than fiscal incentives most likely also play a role.

Another limitation revolves around the issue of data sources. To estimate wages, we used a wide range of data from different sources. Especially the data on education and income were crucial for this estimation, but come from different sources. A solution for this could be to make use of microcensus data. Microcensus data provide detailed information on the individual or household level. This granularity allows for more precise analysis and the ability to identify patterns and trends that might be obscured in aggregated macro-data.

6 Conclusion

This thesis applied the model framework developed by Albouy (2012) to evaluate Austria's fiscal equalization scheme in terms of efficiency and equity, using pooled cross-sectional OLS regressions on state-level data from 2017 to 2022.

The findings reveal that the scheme falls short on both fronts. No significant relationship exists between local government expenditure and measurable net fiscal benefits, suggesting that the system does not promote efficient spatial allocation or adequately internalize fiscal externalities. Instead of incentivising movement to high-spending regions or compensating tax-exporting states, the scheme maintains existing imbalances.

On the equity side, the distribution of grants tends to favour states with higher potential and realized incomes, contrary to the redistributive goals of equalization. While cost-of-living adjustments reveal a modest equity channel through federal transfers, the broader distribution of net fiscal benefits remains regressive. These patterns appear rooted in Austria's centralized tax structure, where a significant share of grants reflects where revenues are generated, not where needs are greatest.

Together, these results support the view that Austria's fiscal equalization system is shaped more by political negotiation and historical legacy than by a coherent economic rationale. Rather than correcting regional disparities, the system partially preserves them.

This thesis adds to the current debate about Austria's federal fiscal architecture. As policy-makers talk about redesigning the federal system in the context of budget cuts, it is important to understand how the current system works in order to make informed decisions about reforms.

To move toward a more efficient and equitable system, future reforms should aim to better target grants toward lower-income, higher-cost regions, particularly those where households

face structural disadvantages in income potential. Doing so would help bring Austria's fiscal equalization mechanisms closer in line with both theoretical ideals and the intended purpose.

As mentioned above, future research could make use of more micro-level data to better capture households and individuals. Furthermore, since municipalities and states are integrated in the Austrian fiscal equalization scheme, a more comprehensive analysis would benefit from including them.

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Appendix

Table A1: Non-exhaustive overview of taxes in Austria

Tax	Levied by	Type	Notes
Lohnsteuer	Federal	Residence	Tax on salaries
Umsatzsteuer	Federal	Source	Value added tax
Körperschaftsteuer	Federal	Source	Tax on business
Einkommenssteuer	Federal	Residence	Also includes other sources of income
Verbrauchssteuern und Energieabgaben	Federal	Source	Extra tax on certain goods and energy sources
Wohnbauförderungsbeitrag	State	Residence	Since 2018 state tax. Dependent on wage
Feuerschutzsteuer	State	Source	Part of the tax on insurance
Fremdenverkehrsabgaben	State	Source	Tourist tax paid to the State
Fremdenverkehrsabgaben	Municipality	Source	Tourist tax paid to municipality
Grundsteuer A	Municipality	Source	Property tax for agricultural businesses
Grundsteuer B	Municipality	Source	Property tax for other assets
Kommunalsteuer	Municipality	Source	Paid by businesses to the municipality they are located in
Gebrauchsabgaben	Municipality	Source	Paid to use public space
Interessenbeiträge von Grundstückseigentümern und Anrainern	Municipality	Source	Tax on property owners to improve public space
Landschaftschutzabgabe	State	Source	Tax levied on activities that impact surroundings
Lustbarkeitsabgaben	State	Source	Tax levied on events
Gebühren für die Benutzung von Gemeindeeinrichtungen	Municipality	Residence	Although tied to usage, mainly paid by residents
Abgaben für das Halten von Tieren	Municipality	Residence	Tax on owning pets
Verwaltungsabgaben	Municipality	Costs of granting authorisations and other official acts	
Dienstgeberabgabe für den Wiener U-Bahnbau	State	Source	Paid by employers in Vienna per week of employment
Seuchenvorsorgeabgabe	State	Residence	Only in Lower Austria, health contribution for epidemic prevention

Source: Austrian Federal Ministry of Finance. Overview of tax relationships between governments.

Table A2: Summary of Pooled OLS Regressions on Federal Grants Differential with Centered Composition Variables

	Medium education centered	Higher education centered	Industry share centered	Services share centered
Coefficient	-1724.886***	1626.275**	-1112.851	1490.005
Std. Error	(482.086)	(597.822)	(1346.999)	(849.083)
Adj. R^2	0.183	0.176	0.058	0.156

significant at 10% ** significant at 5% *** significant at 1%

Table A3: Summary of Pooled OLS Regressions on Measurable Net Fiscal Benefits with Centered Composition Variables

	Medium education centered	Higher education centered	Industry share centered	Services share centered
Coefficient	-2579.944**	2467.423**	-1557.072	2048.860
Std. Error	(806.092)	(890.367)	(2204.744)	(1485.276)
Adj. R^2	0.082	0.081	0.015	0.055

significant at 10% ** significant at 5% *** significant at 1%