

Sustainable finance and horizontal fiscal equalization: the case of bolivian municipalities*

Finanzas sostenibles e igualación fiscal horizontal: el caso de los municipios bolivianos

Bernardo X. Fernández-Tellería**

British Embassy in Bolivia
bernardoferna@gmail.com

 0009-0000-0207-401X

Leticia Victoria Castedo Michel

University of Padova, Italia

 0009-0005-6711-416X

Abstract: Sustainable finance is consistently gaining relevance in financial markets across the world including Bolivia, a country where more than seventy percent of the population live in urban areas. Even though municipalities should be a top destination of sustainable funding to address the country's most urgent development challenges, they have struggled to access the local financial market mainly due to their highly heterogeneous financial strength. To address this, the paper proposes a novel financing scheme that combines the notion of *horizontal fiscal equalization* – a redistributive approach to transfer resources from richer to poorer jurisdictions to mitigate size and development differences – and the principles of sustainable finance to face major development challenges associated with poverty, inequality and climate change vulnerability. To illustrate this, the paper estimates and characterizes the relative financial strength of Bolivia's ten main municipalities and shows that three well-known investment vehicles amenable to the notion of horizontal fiscal equalization can be effectively used for channeling much needed sustainable funding to local governments. In effect, the proposed financing scheme could increase financial inclusion amongst Bolivian municipalities and channel much-needed funding to significantly enhance the country's efforts to achieve its climate commitments and development goals.

Keywords: sustainable finance, fiscal equalization, municipalities, financial inclusion.

JEL Classification: Q01, G1, G18, H63

*This document does not necessarily reflect the views of the FCDO

**Corresponding autor

Resumen: Las finanzas sostenibles están ganando relevancia de manera constante en los mercados financieros de todo el mundo, incluida Bolivia, un país en el que más del setenta por ciento de la población vive en zonas urbanas. Aunque los municipios deberían ser uno de los principales destinos de la financiación sostenible para abordar los retos de desarrollo más urgentes del país, han tenido dificultades para acceder al mercado financiero local, debido principalmente a su gran heterogeneidad en cuanto a solidez financiera. Para abordar esta situación, el documento propone un novedoso esquema de financiación que combina la noción de *igualación fiscal horizontal* —un enfoque redistributivo para transferir recursos de las jurisdicciones más ricas a las más pobres con el fin de mitigar las diferencias de tamaño y desarrollo— y los principios de las finanzas sostenibles para hacer frente a los principales retos de desarrollo asociados a la pobreza, la desigualdad y la vulnerabilidad al cambio climático. Para ilustrarlo, el documento estima y caracteriza la solidez financiera relativa de los diez principales municipios de Bolivia y muestra que tres conocidos vehículos de inversión susceptibles de la noción de *igualación fiscal horizontal* pueden utilizarse eficazmente para canalizar la tan necesaria financiación sostenible a los gobiernos locales. En efecto, el plan de financiación propuesto podría aumentar la inclusión financiera entre los municipios bolivianos y canalizar la financiación tan necesaria para mejorar significativamente los esfuerzos del país por cumplir sus compromisos climáticos y sus objetivos de desarrollo.

Palabras clave: finanzas sostenibles, igualación fiscal, municipios.

1. Introduction

Sustainable finance is consistently gaining relevance across the world. Currently around ten percent of global debt is classified as sustainable and this share is expected to grow [1]. This type of funding is also becoming more relevant for subnational governments, as the need to fund local contributions to the world's sustainable development agenda, has proved essential [2]. To date, at least USD 4.2 trillion in municipal bonds have been issued only in the US, with 12% of these classified as sustainable [3].

In Bolivia, more than seventy percent of the population live in urban areas, implying that municipalities should be the top destination for sustainable funding to effectively address the country's most urgent development challenges. However, in reality, Bolivian municipalities have so far struggled to access either conventional or sustainable funding in the local financial market.

La Paz issued conventional or “vanilla” bonds in 2008 and in 2018 [4], while Santa Cruz issued its first “vanilla” bond in 2025. The remaining 341 municipalities have had no experience whatsoever issuing debt, let alone of the sustainable kind. This main reason for this is the high levels of financial and technical heterogeneity amongst municipalities, which effectively excludes them from the financial markets.

To address the above, this paper proposes a novel financing scheme that combines the notion of *horizontal fiscal equalization* – a redistributive approach that aims to transfer fiscal resources from richer to poorer municipalities with the objective of offsetting differences in their size, revenue-raising capacity or service delivery costs – and the principles of sustainable finance for the implementation of local social and green projects aiming to significantly reduce poverty, inequality and climate change vulnerability.

To illustrate the scheme, the paper first estimates and characterizes the relative financial strength of Bolivia's ten main municipalities as evidence of the very high levels of fiscal and financial heterogeneity amongst them.

Then, the paper seeks to demonstrate that three well-known investment vehicles – specialized investment funds, pooled securitization and crowdfunding – are amenable to the notion of *horizontal fiscal equalization* and thus can help to increase the levels of financial inclusion for municipalities and gain help them access to much needed sustainable funding to implement urgent local green, social and sustainability-linked projects.

After this introduction, the second section provides the definitions sustainable finance and fiscal equalization, making emphasis in its horizontal version, while the empirical evidence highlighting the benefits of these for local governments is presented in the third section.

The fourth section applies these concepts to the Bolivian case focusing on the country's ten largest municipalities making emphasis in their significant financial heterogeneity, preventing the relatively weaker from accessing the financial markets.

Then, it demonstrates that the three proposed financing mechanisms applied to the Bolivian case are amenable to the notion of horizontal fiscal equalization and have great potential to help municipalities gain access to the local financial market and in particular to sustainable financing alternatives under relatively better financial conditions associated to this type of funding, known as “green premia”. The fifth section offers some concluding remarks.

2. Main definitions

2.1 Sustainable finance and sustainable municipal finance

Following the International Capital Market Association (ICMA) [5], sustainable finance is defined as financing closely associated to climate, green and social purposes with a long-run investment horizon. Worldwide efforts in energy transition, waste management and biodiversity conservation as well as in poverty and inequality reduction are distinctive projects considered. The concept encompasses financial flows under different types of operations such as bonds and equity issuance, derivatives, official assistance or philanthropy, as well as for different jurisdictions, including multilateral, sovereign, domestic or municipal.

Sustainable finance is consistently gaining relevance across the world. Currently, around ten percent of global funding is classified as sustainable and this share is expected to continue growing [1]. In the same line, this type of funding is also becoming more relevant for subnational governments, as the need to fund local contributions to the world's sustainable development agenda has become critical [6].

Municipalities have been issuing conventional debt since the 1800s to fund major infrastructure projects to address large migration to urban areas.¹ While institutional investors – banks, insurance companies, asset funds – have traditionally invested in these, retail investment by individuals, small companies and

¹ See https://www.sechistorical.org/museum/galleries/mun/mun02a_share_growth.php

communities has also become significant. Nowadays, the municipal bond segment has developed into a multi-trillion-dollar market with more than 59,000 issuers worldwide.²

Sustainable municipal finance is much younger, with the world's first sustainable municipal bond issued by Massachusetts in 2013, closely followed by Gothenburg in Sweden the same year. Since then, the subnational sustainable bond market has been growing steadily, providing strategic funding to local governments, representing a quarter of the cumulative sustainable bond issuances by the public sector worldwide worth around USD 2 trillion by 2024 and with a positive outlook in terms of future expansion [7].

The proceeds of sustainable municipal bond issuances have sought to close the gaps toward the sustainable development goals (SDGs) at local level. For instance, funding obtained through social bond issuances focuses on affordable basic infrastructure, access to essential services, affordable housing, employment generation, food security, or socioeconomic advancement, while funding from green bonds focuses on energy transition (renewable energy and energy efficiency), pollution prevention, waste management and circular economy, green building and clean transportation; both in line with ICMA's principles of thematic or sustainable bonds [8].

2.2. Fiscal Equalization: no one is left behind

Significant disparities in fiscal and financial capacity across cities and municipalities within a country have been historically documented worldwide, reporting not only differences in their local government's ability to raise revenue but also in the costs faced when providing essential public services [9].

In this context, *fiscal equalization* emerges as a redistributive approach that aims to transfer fiscal resources from relatively richer to poorer jurisdictions with the objective of offsetting differences in their size, revenue-raising capacity or service delivery costs that affect the welfare of citizens from relatively poorer jurisdictions.

The primary goal of fiscal equalization is to ensure that all subnational governments are able to provide a comparable level of public services at different tax burdens. This mechanism has become key in decentralized systems to correct structural

imbalances and ensure fair access to public goods. It helps stabilize regions facing asymmetric economic shocks, reinforcing social cohesion and territorial equity [9].

Fiscal equalization can be vertical or horizontal. In vertical equalization systems transfers flow from the central government to subnational governments, while in horizontal equalization wealthier or lower-cost jurisdictions help fund those that are less capable to raise funds or face higher service delivery costs [10]. Europe has a long history of such arrangements, with Switzerland, Germany, Denmark, Sweden and Norway among the oldest and most sophisticated hybrid (horizontal and vertical) systems, although the vertical schemes of Spain, Italy, Lithuania, Canada and Australia deserve a mention too [11,12]. In turn, progress in this field has been less significant in emerging economies, with Brazil's vertical scheme and Chile's horizontal model amongst the most relevant.

In general terms, horizontal equalization schemes are less prevalent than their vertical counterparts as in the former great care is required in designing the rules of the financial support going from relatively richer to poorer municipalities to ultimately ensure public services provided in all are of similar quality and scope [11].³

While horizontal arrangements are generally part of the national fiscal arrangement adopted in a country and hence tend to be obligatory [13], they could also be adopted as a voluntary scheme. For example, in urban *metropolization* phenomena [14], whereby neighboring municipalities merge in one large metropolitan region, the richer municipality might have clear incentives to support its poorer counterpart to improve its ability to provide comparable quality merit goods (e.g. health, education, climate change resilience, security and care) creating positive welfare externalities for the entire metropolitan region [15].

In addition, horizontal arrangements can be applied for more specific interests, such as creating mechanisms that help poorer municipalities accessing sustainable funding with strategic endorsement and financial and administrative support from their richer counterparts, as it shall be demonstrated in section 4.

² See <https://www.msrb.org/MSRB-News/Creation-MSRB>

³ These rules, usually designed and implemented by an independent government entity, include a) the definition of thresholds to determine which municipalities are categorized as relatively rich (and contribute to the scheme) and which are relatively poor (and receive funds from the scheme), b) define annual transfers according to revenue gaps or excess costs of the poorer municipalities, vis-à-vis standard or average levels of public good provision, and c) continuous assessment of the scheme to evaluate contributor and recipient municipalities' development indicators as a result of the scheme. See, for instance, https://www.cgc.gov.au/sites/default/files/2025-03/2025R_Commissions%20Assessment%20Methodology_HFE_0.pdf

3. A review of the empirical evidence

3.1. The benefits of sustainable finance for local governments

Several studies have examined and documented the benefits of sustainable funding available to local governments. For instance, Rai and Raisada develop interview-based case studies of Toronto, San Francisco and Cape Town to highlight the wide benefits of city green bond issuances to fund renewable energy generation, water management and green building projects, respectively [16].

Likewise, the Asian Development Bank provides a thorough literature review to document the potential of this type of funding in South East Asia, with close to USD 93 billion in outstanding bonds issued so far and a large role expected for blended finance to provide additional guarantees and leveraging opportunities [17]. In the same line, Dwivedi provides technical details – in terms of water usage efficiency and water quality improvement using sectorial data – of successful municipal bond issuances to improve water management infrastructure in India, and proposes mechanisms to include smaller local governments in the market [18].

Despite slow progress in Europe⁴, the pioneering green bond issuances of Gothenburg⁵ to expand its electric public transport, water management facilities and biogas production as well as the successful cases reported by sustainable credit agencies for local governments MuniFin in Finland [19] and Abundance Investments in the UK [20], are often cited as inspiring examples of retail sustainable municipal bond sales to fund small and mid-sized local development projects.

In terms of financial costs derived of sustainable bond issuances, Partridge and Romana provide statistical evidence of the so-called “green premium” or relatively lower financial costs derived from issuing sustainable bonds compared to their “vanilla” counterparts in the US municipal bond market, as these proceeds of these fund projects aiming to resolve socially desirable issues of urban development, social welfare and environmental resilience [21].⁶

With the exception of Ciudad de Mexico’s USD 50 million

green bond issued in 2016⁷ and Bogota’s USD 167 million social bond for education in 2021,⁸ Latin America has had little experience with sustainable financial instruments at subnational level.⁹ Here, Schloeter’s qualitative analysis identifies low credit rating, strong dependence on central funding and the lack of sovereign guarantees as key obstacles for further progress in this field [23], while Ardanaz et.al and Bakaj et.al look at local governments’ balance sheets and organograms in selected Latin American municipalities to highlight the high degree of financial and administrative heterogeneity observed amongst them [24], leaving the relatively weaker excluded from the financial markets [25].

Bolivia is a good example of the above, as only La Paz and Santa Cruz have been exposed to the process and requirements of issuing “vanilla” municipal bonds or securing private bank loans. The remaining 341 municipalities have had little to no experience issuing debt in the market, let alone of the sustainable kind.

3.2. The benefits of fiscal equalization for local governments

Several countries have achieved notable progress in reducing regional disparities through well-calibrated equalization mechanisms. For instance, in a statistical study for 20 countries where some type of fiscal equalization based on revenue redistribution is applied, the OECD finds that in 15 of them gains in income equality expressed in terms of Gini coefficient reductions were significant [26].

One of the world’s most renowned equalization schemes is that of Switzerland, in place since 1938. Initially purely vertical, it was reformed in 2004 to add horizontal features to the scheme so that richer cantons financially support the relatively poorer, as part of a larger program to strengthen the local governments’ capacity to collect taxes and establish long-term inter-canton cooperation schemes. This reform was found to lead to a stronger balance between local autonomy and solidarity, as all cantons reduced their dependency on the central government, as demonstrated by Belser and Erkoreka’s in-depth analysis and comparison of subnational fiscal accounts [27].

In terms of the experience of emerging economies, Litschig and

⁴ See <https://www.capitalmonitor.ai/institution/government/sustainable-bonds-europes-municipals-green-money/>

⁵ See <https://unfccc.int/climate-action/momentum-for-change/financing-for-climate-friendly/gothenburg-green-bonds>

⁶ Fernandez and Uzqueda provide a descriptive statistical analysis and evidence on the existence of the green premium in Bolivia, looking at the private debt market as no sustainable municipal bonds have been issued to date [22].

⁷ See <https://www.southpole.com/news/mexico-city-issues-first-municipal-green-bond-in-latin-america>

⁸ See <https://www.bloomberglinea.com/2021/12/02/bogota-la-primera-ciudad-de-america-latina-en-emitir-bonos-sociales/>

⁹ Acknowledging this, in 2024 the IADB allocated USD 2 million to fund the creation of the Regional Association of Green Bonds. See <https://www.iadb.org/es/proyecto/RG-T4159>.

Morrison developed a regression discontinuity design using subnational data from the 1980s and finds a positive impact of Brazil’s vertical equalization scheme on schooling and poverty reduction [28]. In turn, Eckardt et.al present comparative statistics and a regression analysis that demonstrate the positive impact of a hybrid equalization system on fiscal convergence measured by the region’s per-capita expenses and on expenditure efficiency, showing that the richest regions spend only 18% more than the poorest to implement the scheme [29].

More recently, using time series analytics of per-capita expenditures vis-a-vis citizen basic needs in Brazilian municipalities, Cronemberger finds that more horizontal fiscal equalization schemes tend to yield stronger results in terms of fiscal equity and convergence [30]. Likewise, Acuna looks into subnational fiscal and income data in Chilean municipalities to statistically test the impact of its horizontal equalization scheme based on both revenue and spending needs, finding positive results in terms of efficiency and income equality convergence [31].

To conclude, successful cases show that fiscal equalization tends to be more effective and politically sustainable when

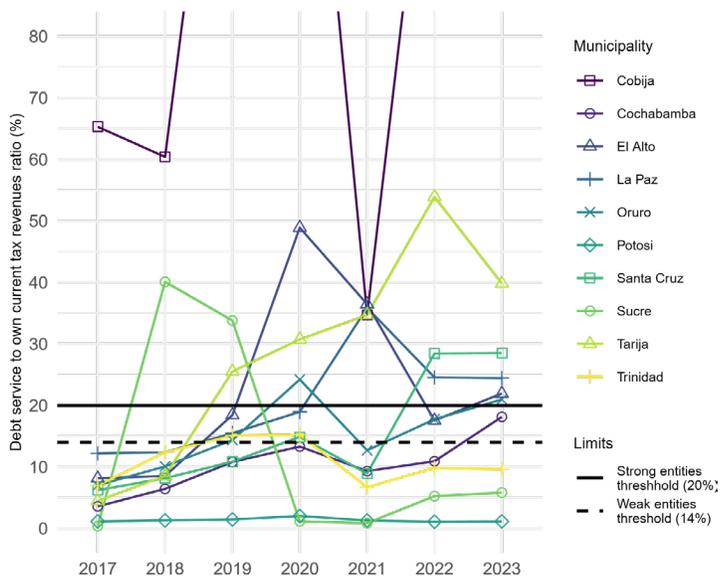
they strike a balance between equity and autonomy [32], while horizontal schemes tend to generate the most desired results, as discussed before [30]. Clear and transparent allocation formulas based primarily on objective criteria such as fiscal capacity and expenditure needs and less so on vertical elements such as fixed amount transfers received from the central government contribute to the legitimacy and sustainability of these schemes over time [32].

4. An application for Bolivian municipalities

4.1. Identifying financial heterogeneity amongst municipalities

To illustrate the highly heterogeneous financial strength and hence funding capabilities of municipalities in Bolivia, this section estimates key debt sustainability indicators for the country’s ten largest municipalities¹⁰ home of around 80% of the total population. The indicators are compared with well-known sustainability thresholds that measure their ability to repay their debt according to the local norm and in alignment with international benchmarks.¹¹

a) Debt service to total current revenues



b) Debt service to own current tax revenues

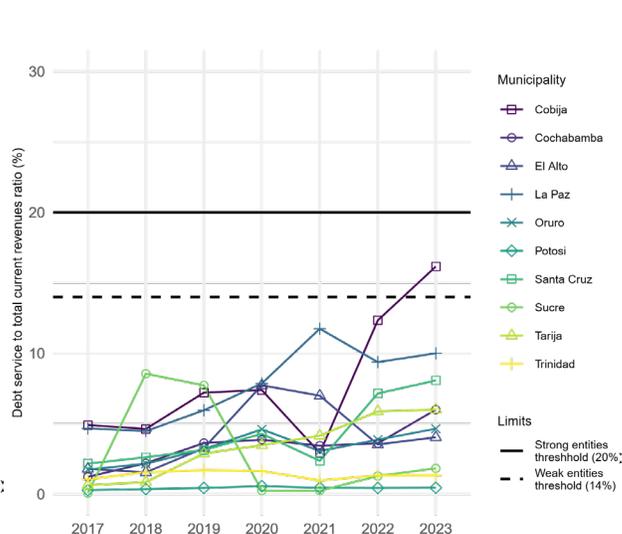


Figure 1: Debt service to revenues by municipality (2017-2023)

Source: Own, based on data from the Ministry of Finance

¹⁰ The data used to estimate the indicators are the income, spending and debt stock and the debt service schedule available at https://www.economiayfinanzas.gob.bo/viceministerios/vtcp/deuda_cronogramas_pagos_eta_up_ultima_gestion.

¹¹ See <https://www.imf.org/en/About/Factsheets/Sheets/2023/imf-world-bank-debt-sustainability-framework-for-low-income-countries> and <https://bolivia.infoleyes.com/articulo/101832>

Short- and long-term debt sustainability are assessed through liquidity and solvency indicators. Figure 1 presents a liquidity indicator measured by the debt service-to-revenue ratio which should not exceed 20% for financially strong municipalities and 14% for weak municipalities. When considering all types of current revenues in the left panel, it can be seen that all the municipalities of the sample show ratios below the thresholds, with the exception of Cobija.

The results change significantly when only own tax revenues are considered – i.e. excluding tax revenue transfers from the national government – in the right panel. According to this measure, Cobija shows the highest and most persistent ratio, while Tarija, La Paz, El Alto, Oruro, and, more recently, Santa

Cruz, exceed the 20% limit especially after the pandemic. Only Cochabamba, Potosí, and Sucre have remained below the 20% and 14% thresholds most of the time. In general, with few exceptions, the strong dependency of municipalities on transfers from the national government makes them highly vulnerable to country wide economic phenomena, increasing the risk of default of their debt.

Figure 2 provides great insights around the above results. The share of own tax revenues with respect to total current income remains relatively low across all municipalities. La Paz shows the highest levels of financial self-sufficiency as its own-source revenues account for 41% of total current income, followed by Cochabamba Potosí, Sucre, and Santa Cruz.

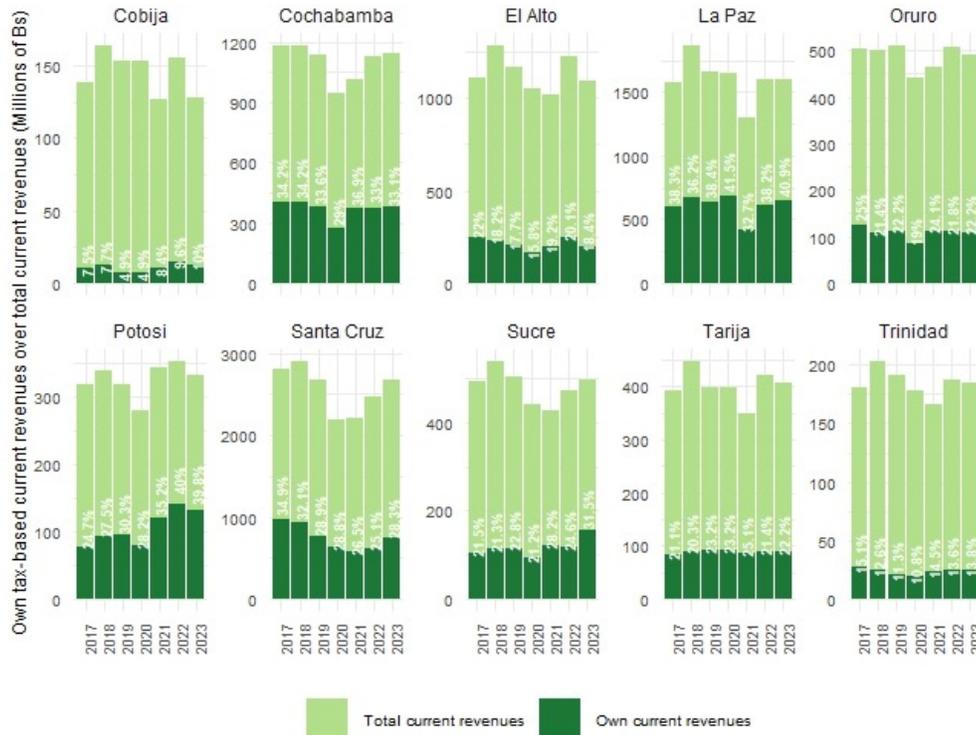


Figure 2: Own current revenues over total current revenues by municipality (2017-2023)

Source: Own, based on data from the Ministry of Finance

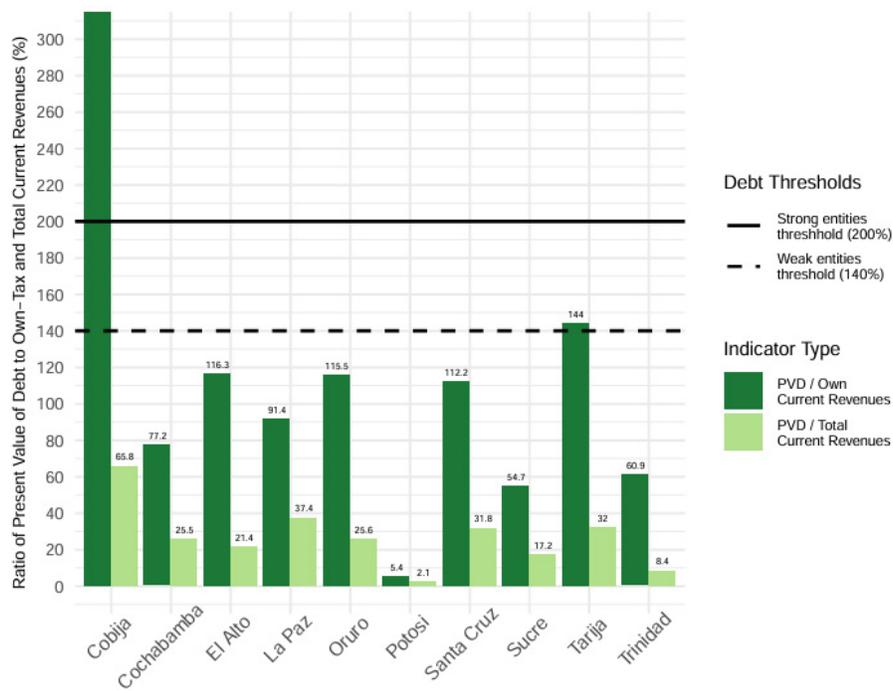


Figure 3: Present value of debt to own and total current revenues (2017-2023)

Source: Own, based on data from the Ministry Finance

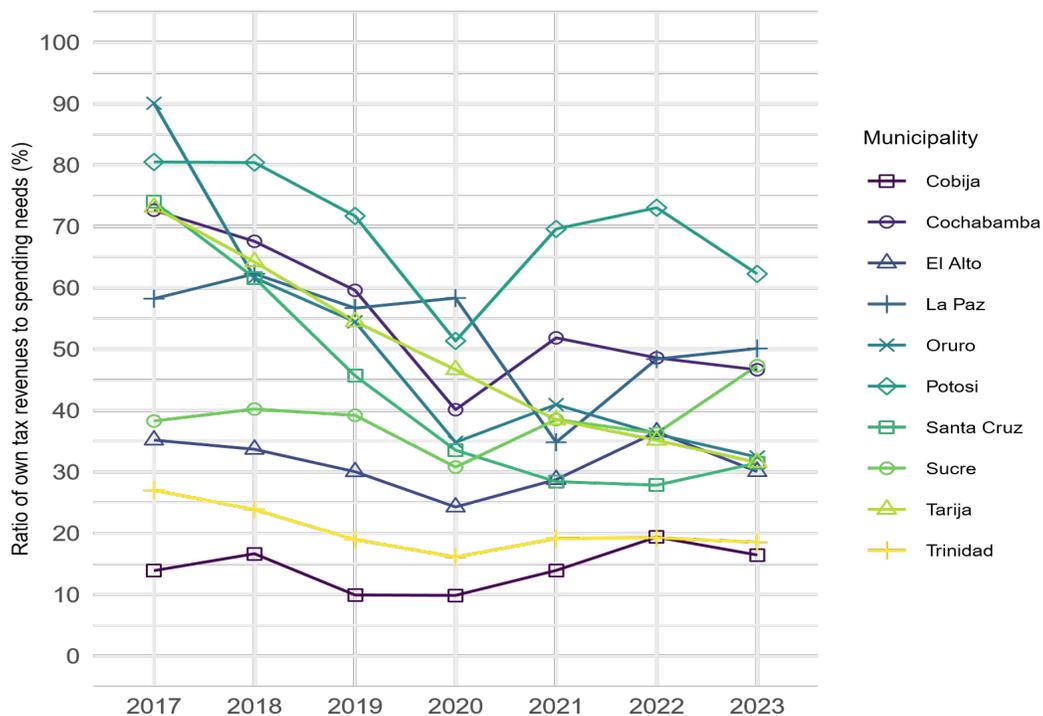


Figure 4: Own tax revenues vs. spending needs by municipality (2017-2023)

Source: Own, based on data from the Ministry of Economy and Finance

The remaining municipalities show lower levels of financial independence with Cobija at the extreme with own revenues representing only 4.9% of total income. The self-sufficiency gap between La Paz and Cobija is very significant: an average of 31 percentage points between 2017 and 2023.

Looking into long-term indicators, the present value of debt¹² relative to current revenues is a key indicator for solvency. Figure 3 shows that, with the exceptions of Cobija and Tarija, the municipalities in the sample show strong present-value-debt-to-revenue ratios as these do not go beyond the sustainability thresholds irrespective of whether own resources or total income are considered. Hence, despite facing some liquidity constraints, most municipalities remain solvent in the long term, potentially making them eligible to access sustainable funding.

Finally, following Shah, the ratio of own tax revenues to estimated spending needs¹³ is presented next as a relevant indicator

to assess municipal financial strength vis-a-vis the citizens' basic needs [33].

The results shown in Figure 4 reveal persistent disparities. Potosí and Cochabamba stand out for consistently covering a high share of their needs with their own revenues, reaching up to 80% of their estimated expenditure needs in 2017, demonstrating strong self-sufficiency, while Cobija and Trinidad show the weakest performance, with self-sufficiency ratios reaching 27%.

Taken together, as shown in Table 1, the indicators reveal stark contrasts in municipal financial and overall fiscal strength. In Tier 1 with an expected risk rating within the AA bracket,¹⁴ Cochabamba, La Paz, Potosí, and Sucre consistently show stronger performances, combining lower debt burdens, higher revenue autonomy, and a better capacity to meet their expenditure needs.

Table 1: Summary of financial strength of selected municipalities

| Tier | Rationale | Municipalities | Theoretical Risk Rating Bracket |
|------|--|--------------------------------------|---------------------------------|
| 1 | Low debt burden, moderate revenue self-sufficiency, meet expenditure needs | Cochabamba, La Paz, Sucre, Potosí | AA |
| 2 | Moderate debt burden, low revenue self-sufficiency, pressure on expenditure needs | Santa Cruz, Oruro, El Alto, Trinidad | A/BBB |
| 3 | High debt burden, very low revenue self-sufficiency, pressure on expenditure needs | Cobija, Tarija | B |

Source: Own Elaboration

Santa Cruz, Oruro, El Alto and Trinidad would occupy Tier 2 with an expected credit risk rating falling in the A to BBB brackets, due to manageable long-term debt payment levels but growing pressure on their own revenues and service demands.

Finally, Cobija and Tarija would fall in Tier 3 and expected credit rating within the B bracket, due to their fiscal fragility, with high debt ratios, limited own-source income, and some gaps in funding essential services.

¹² The present value of the debt was calculated by projecting the average debt service over the remaining maturity period of the liabilities for each municipality liabilities, using the 12.67% official social discount rate recognized by the government for public investment projects to express the numbers in their present value (see https://www.planificacion.gob.bo/uploads/Res_Ministerial_N_159_ResolucionMinisterialRazonesPrecioCuenta.pdf).

¹³ Spending needs were approximated by the long-term trend component of the municipalities' current expenditure data filtered using Hodrick-Prescott.

¹⁴ In 2023, La Paz was given a credit risk rating of AA- by AESA Rating (<https://www.aesa-ratings.bo/comunicados-de-prensa/aesa-ratings-calificadora-de-riesgo-comunica-la-calificacion-al-programa-de-emisiones-de-bonos-municipales-del-gobierno-autonomo-municipal-de-la-paz-gamlp-emision-1-por-bob-140-millones>), whose report is used to roughly extrapolate the likely credit ratings for the other municipalities of the sample, based solely on the financial aspects discussed here.

4.2. Characterizing fiscal equalization in Bolivia

Bolivia has been implementing a vertical fiscal equalization scheme for more than 30 years through a decentralized system of fiscal transfers from the central government to subnational entities, designed to address regional inequalities. The process began in the mid-1990s but has evolved significantly, particularly with the inclusion of tax revenues related to natural gas exports [34].

The country's vertical equalization model has worked through two main funding mechanisms [35]: a) A tax revenue co-participation scheme, which allocates a percentage of national tax revenues – e.g. value-added, transactions, excise, and corporate tax – to all municipalities based on population size, and b) a hydrocarbon direct tax (IDH) revenue sharing system by which gas sale tax revenues are shared among producing and non-producing departments, municipalities, and universities, applying a formula that has also evolved through time seeking to allocate increasing funds to municipalities and to provide compensatory funds to less-resourced regions [36].

While this decentralized fiscal transfer system has achieved some positive redistributive outcomes for smaller municipalities, it faces significant challenges common to horizontal

equalization schemes as discussed earlier [36]: a) persisting inequalities amongst municipalities despite the redistributive efforts mainly associated to lack of technical capabilities and low inter-municipality cooperation [37], b) low fiscal autonomy of municipalities - especially smaller and rural – as central government transfers account for over 70% of their total income, and c) political conflict due to a strong rent-seeking behavior of the regions that try to maximize transfers through social and political pressure.

While proposing an overall solution to the challenges of the current fiscal decentralization and fiscal equalization arrangement in Bolivia is beyond the scope of this study, it does want to advocate for the design and implementation of a specific horizontal fiscal equalization scheme based upon inter-municipality financial and administrative support and cooperation from wealthier to poorer municipalities to enhance sustainable financial inclusion of the latter, while facing relatively lower financial costs that exist in the sustainable finance markets.¹⁵

Following worldwide experiences, the proposed scheme could be imposed by law [13]. However, it is worth emphasizing the

relatively stronger incentives of horizontal fiscal equalization in promoting solidarity and inter-municipal cooperation [30,31]. In effect, the financing schemes to be described next promote access to credit of poorer municipalities as they are financially supported by wealthier municipalities through well-known bundling or packaging practices in finance. In turn, this newly achieved financial inclusion for Bolivian municipalities becomes a game changing opportunity to enhance merit good production and accelerate local sustainable development.

As mentioned before, given the strong fiscal, financial but also social and environmental properties of the arrangement, the

possibility to access sustainable funding at lower financial costs – green premia for sustainable bonds – would benefit both richer and poorer municipalities. Additional financial or fiscal backing to the initiative coming from the central government or the international cooperation would only help expanding the size and positive impact of the virtuous combination of sustainable funding and municipal solidarity. The financial vehicles and instruments that best fit into the above are described next.

4.3. Structuring sustainable financing for Bolivian municipalities under horizontal fiscal equalization

This study proposes three well-established financial investment vehicles that can be used to secure sustainable funding for all municipalities in Bolivia while considering the principle of horizontal fiscal equalization, combined with some vertical support elements. That is, relatively poorer municipalities could be included in a financing structure with the financial and administrative support of larger and wealthier municipalities (horizontal equalization), and with additional support from the central government and/or international development organizations (vertical equalization).

Municipal sustainable bond investment funds

An investment fund specialized in investing in sustainable municipal bonds would effectively hold a portfolio of such bonds with different credit risk profiles that on average will bear a tolerable credit risk exposure. As shown in Figure 5, this structure is readily available in Bolivia as current fund managers (SAFIs) could establish municipal investment funds with an attractive return-risk profile to reach interested investors. Through basic portfolio diversification and supported by the higher credit profile of larger peers, weaker municipalities can access funds from the financial market.

¹⁵ For instance, in 2025 Bolivian private bank Banco Sol issued social gender bonds for around USD 20 million at 6.3% YTM, around 200 basis points below market rates for conventional or vanilla instruments.

The above can be done based upon a *barbell* investing strategy by the fund [38], whereby a portfolio with a significant investment share in risky instruments such as bonds issued by relatively weaker municipalities (i.e. those with B ratings) is offset

by equally significant investments in risk-free instruments or foreign instruments from countries with higher sovereign ratings than Bolivia.



Figure 5: Municipal sustainable bond investment fund

Source: Own Elaboration

Sustainability certifications¹⁶required for the sustainable municipal bonds included in the portfolio could be covered as horizontal fiscal-equalization-inspired contributions to this initiative by the richer municipalities although the international cooperation could provide support in this at least to kick-start the initiative. In addition, the latter could offer additional guarantees to raise the risk profile of the municipal bonds and improve the overall financial attractiveness of the scheme.

Securitization of pooled municipal sustainable bonds

Municipal sustainable bonds could be pooled and packed to create new asset backed securities issued by a special purpose vehicle managed by a securitization entity [39]. As shown in Figure 6, the pool will combine bonds issued by diverse municipalities with varying levels of credit risk in a way such that the resulting securities hold an adequate average risk exposure [40].

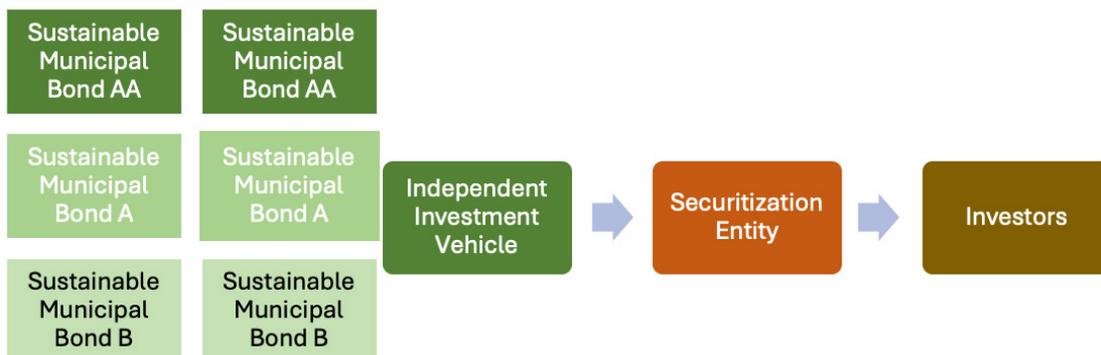


Figure 6: Securitization of pooled municipal sustainable bonds

Source: Own Elaboration

¹⁶ These certifications, in place to ensure the proceeds of the bond issuances will be used for green, social or sustainable projects as announced and until maturity, are fixed amounts that tend to dilute the larger the size of the issuance. For example, for a USD 20 million sustainable bond issuance, the sustainability certifications (at around USD 20,000 on average at current market rates) would represent only 0.1% of the amount issued.

Well-known hedging mechanism to enhance the return-risk profile of the resulting securities, which could be entirely or partially covered by the larger municipalities in line with the notion of fiscal equalization, include [41]:

- *Overcollateralization*, whereby the face value of the bond pool is larger than the par value of the issued bonds. So even if some of the payments from the underlying bonds are in default, the backed securities may still pay principal and interest.
- *Excess spread*, or the additional revenue generated by the positive difference between the coupon of the municipal bonds and the coupon payable on the securities, which can then be used to absorb collateral losses or build overcollateralization.
- *Liquidity fund*, established in excess to the liabilities of the pooled assets, to count with an emergency fund to cover for any losses.

Like in the previous case, additional guarantees and/or insurances could be put forward by the richer municipalities (horizontal equalization) or the central government or the international cooperation (vertical equalization) to strengthen the overall risk profile of the backed securities.

Crowdfunding and retail bond sales

A different arrangement that implies a lower administrative burden on municipalities would require the creation of a new financial entity that operates a local crowdfunding platform and issues sustainable municipal bonds at retail scale. In this case, as seen in Figure 7, the revenues of the bond issuances and funds collected are then allocated to different sustainable projects in member municipalities. Required sustainability verifications of the bonds issued could be covered by the wealthier municipalities.¹⁷

Once more, additional guarantees or credit insurances offered by the richer municipalities or the central government and international development banks can help improve the overall return-risk profile of the bonds issued by the platform and strengthen the overall trust in the mechanism.¹⁸ Additional performance incentives could be put in place to the entity to meet funding targets for smaller municipalities and at longer maturities to support their development ambitions, thus enhancing the fiscal equalization properties of the mechanism.

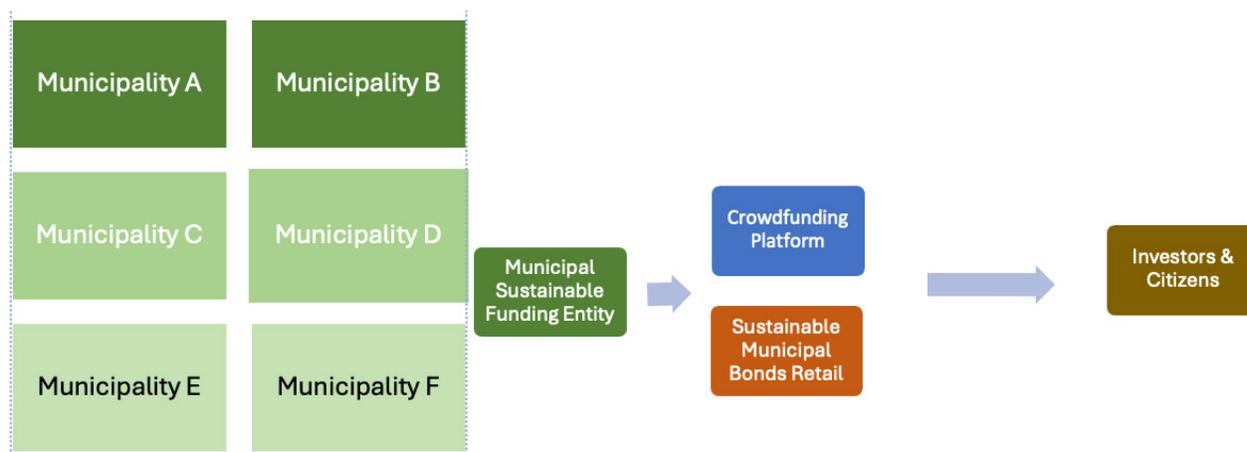


Figure 7: Sustainable municipal crowdfunding & bond retail sales

Source: Own Elaboration

¹⁷ This local financing model is closer to the experience of Local Climate Bonds (LCBs) issued by small counties in the UK with the institutional support of a crowdfunding platform [18].

¹⁸ See <https://www.abundanceinvestment.com/>

5. Closing remarks

This paper has shown that combining notions of horizontal fiscal equalization with subnational sustainable finance instruments such as sustainable municipal bonds issued through three well-known financial investment vehicles represents a novel but very robust approach to ensure Bolivian municipalities of all sizes and particularly the smaller and poorer can access much needed sustainable funding under strong principles of inclusion and solidarity.

Hence, the promotion and strengthening of these mechanisms should be part of the country's long-term economic development plan. Acknowledging that climate commitments and the SDGs will only be achieved if solutions at a local level are in place [42] implies that public policy should focus on developing a national sustainable development strategy that encompasses strong local competences that are adequately financed through the mechanisms discussed here and with highly competitive financial costs due to the *green* premia identified in the sustainable finance markets.

In light of the above, policy reforms and incentives that promote inter-municipality and/or metropolitan coordination for the delivery of more ambitious sustainable projects on water management, energy transition, clean and inclusive public transport, ecotourism, and waste management and recycling, would certainly help to leverage the expected benefits of fiscal horizontal equalization in terms of more equitable growth across the country with better funding alternatives.

Finally, developing an adequate and harmonized financial regulation that promotes a faster adoption of sustainability policies amongst market actors – banks, asset funds, pension fund, and insurance companies – will add more dynamism and liquidity to the Bolivian financial market, which in turn shall offer better funding opportunities to local development projects.

References

- [1] Climate Bond Initiative (2025). *Sustainable Debt Global State of the Market 2024*. Climate Bond Initiative. Report.
- [2] Ansell, C. Sørensen, E. and J. Torfing (2022). *The Key Role of Local Governance in Achieving the SDGs, Co-Creation for Sustainability*. Emerald Publishing Limited, Leeds, pp. 9-22. <https://doi.org/10.1108/978-1-80043-798-220220002>
- [3] S&P (2024). *U.S. Muni Sustainable Bonds: Moderate Growth in 2024*. Sustainability Insights. Research. Available at: https://www.spglobal.com/_assets/documents/ratings/research/101593184.pdf
- [4] GAMLP (2018). *Las Finanzas del Gobierno Autónomo Municipal de La Paz*. Secretaria Municipal de Finanzas. Report.
- [5] International Capital Market Association (2020). *Sustainable finance high-level definitions*. Available at: <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Sustainable-Finance-High-Level-Definitions-May-2020-051020.pdf>

www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Sustainable-Finance-High-Level-Definitions-May-2020-051020.pdf

- [6] World Bank (2025). *Labeled Sustainable Bonds Market Update*. February 2025. IBRD - IDA Treasury.
- [7] Nuzzo C. and J. Cox (2024). *ESG integration in Sub-Sovereign Debt*. The US Municipal Bond Market. Principles of Responsible Investment.
- [8] International Capital Market Association (2019). *Green, social & sustainability bonds: A high-level mapping to the sustainable development goals*. Available online at: <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/June2019/Mapping-SDGs-to-Green-Social-and-Sustainability-Bonds06-2019-100619.pdf>.
- [9] OECD (2023). *Fiscal equalization and regional development policies: Is there a case for enhanced synergies?* OECD Regional Development Papers. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/11/fiscal-equalisation-and-regional-development-policies_960b4564/0d28a879-en.pdf
- [10] Chakunda, V., C. Dzingirai, and A. Chikerema (2021). *Modelling Intergovernmental Fiscal Equalisation in Zimbabwe. Towards Resolving Vertical and Horizontal Fiscal Imbalances*. *Public Finance Quarterly*, 66(4), pp. 535-550.
- [11] Blöchliger, H. (2014). *Fiscal equalisation – A cross-country perspective*. Berlin Conference on Fiscal Equalisation, OECD.
- [12] Blöchliger H, O. Merk, C. Charbit, and L. Mizell (2014). *Fiscal Equalisation in OECD Countries*. OECD Working Papers on Fiscal Federalism, No. 4. <https://doi.org/10.1787/5k97b11n2gxx-en>
- [13] Commonwealth Grants Commission (2022). *Some international themes in fiscal equalization: an Australian perspective*. Research paper 3. Australian Government. Available at: <https://www.cgc.gov.au/sites/default/files/2022-04/Research%20Paper%203%20-%20International%20comparison%20of%20fiscal%20equalisation.pdf>
- [14] Cardoso, R., and E. Meijers. (2020). *The process of metropolitanization in megacity-regions*. In D. Labbé, and A. Sorensen (Eds.), *Handbook of Megacities and Megacity-Regions*. Research Handbooks in Urban Studies series. Edward Elgar Publishing. <https://doi.org/10.4337/9781788972703.00034>
- [15] Musgrave, R (1957). *A multiple theory of budget determination*. *Finanz Archiv, New Series* 17(3): 333–343.
- [16] Rai, S & S. Raisada (2023). *What are Municipal Green Bonds and how are global cities using them to finance green projects?* World Economic Forum.
- [17] ADB (2023). *Accelerating Green Bonds for Municipalities in South East Asia*. Asian Development Bank, Climate Bond Initiative. DOI <http://dx.doi.org/10.22617/TCS240579-2>.
- [18] Dwivedi, D. (2024). *Review of green bonds for urban WaSH infrastructure investments*. CEPT University. Center

for Water and Sanitation.

[19] Munifin (2025). *Munifin Investor Presentation*. Available at: https://www.kuntarahoitus.fi/wp-content/uploads/2025/03/MuniFin-presentation_March-2025.pdf

[20] Davis, M. (2021). *Community Municipal Investment Accelerating the Potential of Local Net Zero Strategies*. Report. University of Leeds.

[21] Partridge, C. & F. Romana (2018). *Green Premium in the Primary and Secondary US Municipal Bond Markets*. QASER Laboratory, University College London.

[22] Fernández, B. and M. Uzqueda (2023). El “Green Premium” en las finanzas sostenibles: reflexiones para Bolivia. *Revista Latinoamericana De Desarrollo Económico*, 21, 57–74. <https://doi.org/10.35319/lajed.2023esp311>

[23] Schloeter, L. (2016). *Financiando la Infraestructura Urbana en Ciudades Emergentes: Bonos Municipales*. Ciudades Sostenibles. IADB Blog.

[24] Ardanaz, M., A. Munoz and E. Slack (2022). *Municipal Fiscal Health in Latin America*. Inter-American Development Bank. Fiscal Management Division. V Series.

[25] Bakaj, P., Childree, A., Capello, M., Dezolt, A. L., Mac Dowell, M. C., Eguino, H., Grafe, F., Haro González, A., Hathaway, A., Muñoz Miranda, A., Ferreira, S. N., Pineda Mannheim, C. R., Radics, A., Rasteletti, A., Saric, D., Villela, L. A., and Yitani, J. (2023). *Fortalecimiento de la gestión fiscal subnacional: lecciones y aprendizajes desde el terreno (2010-2020)*. IADB. <https://doi.org/10.18235/0004760>

[26] OECD (2021). *Evaluating Fiscal Equalisation: Finding the Right Balance*. OECD working papers on fiscal federalism. No 36.

[27] Belser, E. and M. Erkoreka (2023). The Swiss System of Fiscal Equalisation: Balancing Cantonal Autonomy and Federal Solidarity, in M. Erkoreka ed. *Fiscal Federalism and Equalisation Transfers*. Studies in Territorial and Cultural Diversity Governance. Brill and Nijhoff, 293 pp.

[28] Litschig, S. and K. Morrison (2013). The Impact of Intergovernmental Transfers on Education Outcomes and Poverty Reduction. *American Economic Journal: Applied Economics*, 5(4), 206–40.

[29] Eckardt, S., J. Martinez-Vazquez, and A. Timofeev (2014). *Efficiency Cost of Fiscal Equalization: The Case of Belarus*. International Center for Public Policy, Andrew Young School of Policy Studies No 1401. Georgia State University.

[30] Cronemberger, C. (2022). *Fiscal equalisation in Brazil, Canada and Australia: The case of states or provinces*. Research Brief 36. International Policy Centre for Inclusive Growth.

[31] Acuna, A. (2022). *Análisis del fondo común municipal*. Universidad de Chile. Manuscript.

[32] Bird, R. and M. Smart (2002). Intergovernmental fiscal transfers: International lessons for developing countries. *World development*, 30(6), 899-912.

[33] Shah, A. (2012). *Public services and expenditure need equalization: reflections on principles and worldwide comparative practices*. World Bank Policy Research Working Paper. No 6006.

[34] Faguet, J. (2003). *Decentralization and Local Government in Bolivia: An Overview from the Bottom Up*. Working Paper No. 29. Development Research Centre, London School of Economics and Political Science.

[35] Fedelino, A. (2010). *Making Fiscal Decentralization Work Cross-Country Experiences*. IMF Occasional Papers. <https://doi.org/10.5089/9781589069855.084>.

[36] Frank, J. (2010). *Towards a Fiscal Pact: The Political Economy of Decentralization in Bolivia*. Working Paper Series on Public Sector Management No 70617. World Bank.

[37] Fundacion Jubileo (2021). *Temas Clave para la Gestión de Gobernaciones y Municipios*. Serie Debate Público. No 84.

[38] Trainor, W., D. Cupkovic, & I. Chhachhiand (2020). Using Barbells to Lift Risk-Adjusted Return. *Journal Of Investment Consulting*. Volume 20. No 1.

[39] ASFI (2006). *La Titularización*. Cartillas. Direccion de Supervision de Valores. Gobierno de Bolivia.

[40] Jobst, A (2008). *What Is Securitization?* IMF. Finance & Development September 2008. Available at: <https://www.imf.org/external/pubs/ft/fandd/2008/09/pdf/basics.pdf>

[41] Mason, S & A. Tempkin (2008). *The Basics of Credit Enhancement in Securitizations*. S&P Ratings Direct. No 655928. Report.

[42] UCLG (2021). *Towards the Localisation of the SDGs*. UCLG and Global Taskforce of Regional and Local Governments. Available at: https://gold.uclg.org/sites/default/files/hlpf_2021.pdf