■ RESEARCH ARTICLE

Does Fiscal Decentralization Benefit Sustainable Development? Evidence From 2020

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ABSTRACT: Is fiscal federalism associated with sustainable development in countries around the world? Using the latest data on fiscal decentralization from the IMF, we examine the relationship between fiscal decentralization and various indicators of sustainable development across 59 diverse countries. The indicators of sustainable development include economic, educational, environmental, health-related, and social variables. Our results suggest that the level of fiscal decentralization is significantly associated with the economic, social, and health aspects of sustainable development, and does not correlate with the environmental and educational categories. We also found that in many cases, fiscal revenue and expenditure decentralization have inverse effects. Further research should be conducted to investigate the optimal level of fiscal expenditure and revenue decentralization for each pillar of sustainability and if our results between expenditure and revenue decentralization are also present in other fields. This research serves as a platform for future research on sustainability and fiscal decentralization through specific sustainable development goals.

KEYWORDS: Economics, Sustainable Development, Fiscal Expenditure, Decentralization, Fiscal Revenue, Decentralization, Fiscal Federalism.

Introduction

No country has achieved sustainable development, however, there is a plethora of research on how countries should attack this important topic. Sustainable development is not sustainability, instead, it has been defined as "development that meets the needs of the present without compromising the ability of the future" by the International Institute for Sustainable Development. This has been quantified by creating Sustainable Development Goals, and pillars of sustainable development, such as gender equality, no poverty, peace, justice, and strong institutions. Sustainable development has been a priority in America for over 30 years (President's Council on Sustainable Development) and sustainable legislation is on the docket as we continue through the 21st century. Recently, the excessive consumption of natural resources and the ever-widening pay and economic support gap between richer and poorer countries in the aftermath of the Coronavirus Pandemic have emphasized the need for economic equality.[1] Increased research into factors that impact sustainable development has increased because of these factors, as sustainable development is rooted in equity and equality. We have selected our 59 countries because they were the most representative of all countries and had a comprehensive dataset.

Fiscal decentralization, as we will calculate it in our paper (through both percent expenditure and percent revenue), is the amount of countries' capital/responsibility bestowed upon a decentralized government – government vs local spending and government vs local revenue collection. There was a large shift to fiscal decentralization in the 1980s, transitioning the responsibility of central governments to local governments across the world.[2] Now, the impacts of fiscal decentralization are being measured to inform future policy decisions. Fiscal decentralization has been long researched for its impact on economic development, recently, however, there has been an increased interest in research on its impact on sustainable development. To the best of our knowledge, there has been a gap in research on fiscal expenditure/revenue decentralization and its effect on specific metrics in the categories of sustainable development goals.

In this study, we consider how fiscal decentralization impacts the achievement of sustainable development goals (SDGs). We investigate this issue to clarify which SDGs are impacted by fiscal decentralization and to explore the correlation between fiscal decentralization and specific SDGs. A comprehensive conclusion will guide future policy decisions and areas to subsidize as fiscal decentralization/centralization increases. Additionally, this paper provides valuable insight into what factors aren't affected by fiscal decentralization.

The rest of the paper is organized as follows. Section 2 is a literature review of fiscal decentralization and sustainable development. In Section 3 we present our Data and Methodology, including significance tests between SDGs and fiscal decentralization. Section 4 contains our empirical results and section 5 presents our conclusions.

Literature Review

Two prevailing strands of literature are pertinent to our study. First, the economic impacts of fiscal decentralization, bleeding into sustainable development and the optimal level of fiscal decentralization. The next strand of literature is simply defining what sustainable development is, as this is pivotal to understanding the paper.

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The first strand of literature focuses on fiscal decentralization, mainly the economic implications of fiscal decentralization. This has been researched extensively, and both the impact on countries and corporations have been analyzed. First, the impact of fiscal decentralization on corporations, with Pu *et al.* concluding that fiscal decentralization leads to higher corporate innovation, forwarding economic growth.[3] This, however, is not as clearly shown in the literature on fiscal decentralization's effect on countries' economic growth. Lin & Liu found that fiscal decentralization had a positive effect on economic growth in China from the 1980s to 1990s.[4] This further demonstrates the claim that fiscal decentralization benefits economic growth, however, in OECD countries, it was found that fiscal tax decentralization has an insignificant effect on economic growth. This further lends to the complexity of fiscal decentralization, as different methods often yield different results.[5] In 2003, Martinez-Vasquez & McNab published a paper claiming that there is still a need for more research to decide whether fiscal decentralization is beneficial to economic growth.[6] Since then, Gemmell *et al*. concluded that fiscal revenue decentralization promotes economic growth while fiscal expenditure decentralization hampers economic growth.[7] The link between economic growth and sustainable development has been explored in a multitude of countries around the globe. In Ghana, Dick-Sagoe concluded in a literature review that fiscal decentralization had a positive effect on Ghana's economic growth.[8] This was reverberated in a paper published in the wake of fiscal decentralization in Indonesia, which found that it had beneficial economic outcomes and could provide a sustainable future for local governments in Indonesia.[9] Finally, it was concluded in Russia that fiscal expenditure decentralization will lead to negative economic outcomes without being paired with fiscal revenue decentralization, also finding that dependence on fiscal transfers from a federal government benefits economic growth.[10] The effects of fiscal decentralization are varied across different industries, and its effects are much more visible on a micro-scale. In summary, revenue decentralization leads to economic growth while expenditure decentralization does not. However, a pair of both lead to sustainable local governments and future success.

The second strand of literature focuses on sustainable development. The pillars of sustainable development have been placed into indices, such as the Human Development Index and the National Sustainable Development Index. These indices give us a sense of how sustainable development functions as fiscal decentralization is changed, with studies such as Jin & Jakovljevic finding that a moderate level of fiscal decentralization aids sustainable development by looking at the HDI.[11] This is also reiterated by Hui & Martinez–Vazquez, who, by using the NSDI, found the optimal level of fiscal decentralization and also validated the hump-shaped curve created by fiscal decentralization and sustainable development.[12] Olaide *et al*. found that there was no relationship between fiscal federalism and the NSDI, however, there was a relationship between federalism and economic development, implying that was the reason for certain policy decisions.[13] There has also been research into modifying the NSDI for lack of reliability and continuity.[14] They found that their modified version of the NSDI was more acceptable and reliable, giving a better gauge of sustainable development. In the end, sustainable development has long been researched as an index, however, there is still variation between which indicators are used in each index, giving varied results once again. While there has been a lot of research on sustainability as a whole, there has been little research that compiles different explanatory variables for the pillars of sustainable development and compares that with fiscal decentralization. For the explanatory variables for each pillar, we will use the variables that Özgür *et al*. used in their study for informality and sustainable development.[15]

In sum, there has been an extensive amount of research on fiscal decentralization and economic outcomes and even research on fiscal decentralization and sustainable development, however, there is a gap in the literature investigating what causes the upward and downward slope of the association between fiscal decentralization and sustainable development. We attempt to demonstrate what variables are benefited and undercut by fiscal decentralization, leading to policy decisions that benefit the countries that have differing levels of fiscal decentralization, not only contributing to the research on optimal levels but also showing what SDGs countries should subsidize for differing levels of fiscal decentralization.

■ Methods

Data:

Our main explanatory variable of interest is fiscal decentralization. To create a benchmark for this analysis, we used the revenue-centralization approach, measuring the ratio of central government revenue to the total government revenue. Central government-collected revenue is in the numerator and total revenue collected on the denominator, this includes subnational and local governments. The second indicator is expenditure-centralization, following the same rules as the revenue approach, with the denominator and numerator being expenditure instead of revenue. Both series are obtained from the International Monetary Fund's World Development Indicators, when data is not available there for our selected 59 countries, we default to the OECD library.[16, 17] (Data provided from 2020/2021) Following the approach from Elgin *et al*., we will also use the methodology of Arzaghi and Henderson. This gives us a measure of the institutional and statutory level of fiscal federalism in a country.[18,19] This measures degrees of decentralization instead of benchmark measures.

This is not the most common measure used in the empirical literature on the effects of fiscal decentralization. The fiscal expenditure approach, using a subnational expenditure approach, is also provided by the World Development Indicators. This has been done often by researchers. (Enikolopov & Zhuravskaya; Gemmell *et al*.; Hui & Martinez-Vasquez)[20,7] However, there is no perfect measure, and the criticisms of the GFS-based measure are plentiful among scholars. (Government Finance Statistics provided by the International Monetary Fund)[12] There is a belief that it overstates the actual level of expenditure decentralization. This is partly why we use the revenue approach as well. The main issue with using any other database than the GFS/WDI is that there is a lack of re-

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search into non-EU countries, leading to an overrepresentation of richer countries, this is the case in many studies cited in Hui & Martinez-Vasquez such as Baskaran & Feld and Slavinskaitė.[5,16,21] This leads to one-sided research that cannot be generalized to poorer, developing countries, while the conclusion and policy recommendations will struggle to guide the majority of nations. Availability of data is important, and it is for that reason that we must push past the flaws that the GFS/WDI contains.

Sustainable Development:

In this study, we aim to assess the empirical relationship between fiscal decentralization and sustainable development. Sustainable development is difficult to measure in a few indicators, which is why many researchers use indexes such as the HDI (Human Development Index) and NSDI (National Sustainable Development Index). We have, following the approach from Özgür *et al.*, we grouped the sustainable development indicators into 5 different categories.[15] These include health-related, economic, environmental, educational, and social variables. Each group contains several measures, provided by the World Development Indicators from the IMF (2021 along with fiscal decentralization data).[22] We use these indicators because they let us evaluate each cornerstone of sustainable development. With this ability, we can find what variables have a positive, negative, or no correlation with fiscal decentralization, which would help us explain why the overall indices such as the NSDI have a bell-shaped curve.

The health-related variables include things such as life expectancy, Infant mortality rate, neonatal mortality rate, and mortality under age five. They also include what percent of the population is vaccinated for certain diseases and drinking water/sanitation access. These variables help us gain a picture of what life is like in these countries.

The economic variables group includes three different poverty headcount ratios and gap series, along with access to electricity (by percentage of population). These variables give us an understanding of how financially able the country is, and if the poverty SDGs are met.

The group of environmental variables includes CO_2 emissions per capita, and CO_2 emissions per 2021 GDP, giving us a gauge of the carbon footprint in the countries. This also helps us gain a view of how well these countries are abiding by the Paris 2030 agreement.

The educational variables group contains gross tertiary and gross secondary schooling, giving us a comprehensive, yet brief, understanding of education in the countries we are evaluating.

Finally, the group of social variables, including ILO predictions of female labor force participation and national predictions of female labor force participation. This assesses the extent to which the country has installed institutions and programs to promote equal access for men and women in education, health, the economy, and legal protection. These all give us a picture of what equality exists in the countries, and how much effort is being dedicated to achieve equality.

Control Variables:

In several of our regression models, we use control variables other than fiscal decentralization. These variables include real GDP per capita (IMF), population size (IMF), urban population (percentage of people that live in urban areas, WorldBank), level of democracy (Economist Intelligence Unit), corruption (0-1 with 1 being no corruption, transparency.org), rule of law (ourworldindata.org), and trade openness (percentage of GDP, WorldBank).[10,16,22,23] We consider these variables as commonly used in the literature. We expect that for GDP per capita, urban population, level of democracy, rule of law, corruption, and trade openness, there will be a positive correlation with sustainable development. We expect the population size to have a negative correlation with sustainable development. Trade openness is much more complex, as it reflects the amount of a country's GDP that it trades every year. We expect more trade to increase certain sustainable development indicators while not affecting others. However, increased trade may have ripple effects across different areas of sustainable development. Trade openness is associated with the amount of women's labor force participation.[24] Table 1 provides the descriptive summary statistics for all of our control variables, including log-shifted GDP per capita.

Methodology

Our dataset is a cross-country panel with data just from the year 2020. This dataset is highly unbalanced, however, every country that we have selected has enough sustainable development data from the year 2020 to create a comprehensive piece of data analysis. Before our regression and tests, we log shifted GDP per capita to normalize the data. Stationary tests do not apply to our dataset, because of our exclusively one-year data collection process. For fixed effects estimation, we estimated a model like this to regress sustainable development indicators on fiscal decentralization.

SD_Indicator = β0 + β1*FiscalDecent(i) + β2*Controls(i) + ε(i) (Equation 1)

Here, SD_Indicator is the sustainable development outcome, β0 is defined as the intercept, β1 represents the change in SD_Indicator with a 1 unit change in fiscal decentralization, FiscalDecent(i) is the measure of fiscal decentralization for the ith observation, β2 is the coefficient for the controls in our model, Controls(i) is the vector of our control variables, and finally ε(i) is the error term. Because of the size of our data, limiting ourselves to 59 countries in the year 2020, we only have enough data to run OLS regression models. The results of these models are presented in Table 2.

Table 1: Includes descriptive summary statistics for all variables.

	Fiscal (Own expenditure to general govt, central) 2020	Fiscal (Own revenues to general govt, central) 2020	Real GDP per Capita (IMF)	Real GDP per Capita (IMF) LOG	Pop Size (millions, IMF)	Urban Population (% of total WorldBank)	Level of democracy (Economist Intelligence Unit)	Trade (% of GDP) World Bank	Corruption (Transparency.org)	Rule of Law (ourworldindata.org)
Mean	0.525	0.647	21,768.898	9.337	63.713	68.746	6.386	89.186	51.288	0.676
SD	0.220	0.188	22,744.595	1.274	189.388	18.375	1.987	39.882	18.882	0.287
Max	0.960	0.970	93,710.000	11.448	1,410.000	98.000	9.300	174.000	85.000	0.990
Min	0.130	0.140	648.000	6.474	0.290	18.000	2.100	27.000	12.000	0.100
Obs	59.000	59.000	59.000	59.000	59.000	59.000	59.000	59.000	59.000	59.000

	Life expectancy at birth, total (years)	Infant mortality Rate (per 1,000 live births)	neonatal mortality rate (per 1,000 live births)	Mortality rate, under-5 (per 1,000 live births)	People using safely managed drinking water services (% of population)	People using at least basic drinking water services (% of population)	Immunization, DPT (% of children ages 12-23 months)	Immunization, HepB3 (% of one-year-old children)	Poverty headcount ratio at $2.15 a day (2017 PPP)	Poverty headcount ratio at $3.65 a day (2017 PPP)
Mean	75.464	10.044	6.327	12.675	80.964	94.793	89.695	87.054	2.029	5.400
SD	6.023	11.650	6.476	17.139	24.058	10.451	9.669	14.351	5.838	12.247
Max	84.560	71.700	35.500	112.900	100.000	100.000	99.000	99.000	35.000	68.800
Min	55.970	1.700	0.800	2.100	16.750	55.960	42.000	8.000	0.000	0.000
Obs	59.000	59.000	59.000	59.000	47.000	58.000	59.000	56.000	38.000	38.000

	Poverty headcount ratio at $6.85 a day (2017 PPP)	Poverty gap at $2.15 a day (2017 PPP) (%)	Poverty gap at $3.65 a day (2017 PPP) (%)	Poverty gap at $6.85 a day (2017 PPP) (%)	Access to electricity (% of population)	CO2 emissions (metric tons per capita)	CO2 emissions (kg per 2021 PPP $ of GDP)	School enrollment, secondary (% gross)	School enrollment, tertiary (% gross)	Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate)	Labor force participation rate, female (% of female population ages 15+) (national estimate)
Mean	14.558	0.695	1.911	5.726	95.586	5.018	0.169	102.919	62.062	52.114	54.236
SD	21.239	1.697	4.746	10.226	13.158	4.008	0.107	18.400	24.988	10.037	8.223
Max	91.000	9.700	27.800	53.500	100.000	20.250	0.490	151.730	118.880	71.260	75.000
Min	0.100	0.000	0.000	0.000	42.100	0.040	0.030	46.350	7.240	20.880	30.890
Obs	38.000	38.000	38.000	38.000	59.000	59.000	59.000	53.000	54.000	59.000	51.000

Table 2: Provides the regression model's p-values and correlation for each variable tested.

	Life expectancy at birth, total (years)	Infant mortality Rate (per 1,000 live births)	neonatal mortality rate (per 1,000 live births)	Mortality rate, under-5 (per 1,000 live births)	People using safely managed drinking water services (% of population)	People using at least basic drinking water services (% of population)	Immunization, DPT (% of children ages 12-23 months)	Immunization, HepB3 (% of one-year-old children)	Poverty headcount ratio at $2.15 a day (2017 PPP)	Poverty headcount ratio at $3.65 a day (2017 PPP)
Without Interaction (Coe.) EXP	-0.043	14.138	7.459	23.589	27.043	-1.864	-2.050	-8.343	-8.321	-11.291
P-Value EXP	0.990	0.052	0.033	0.039	0.256	0.886	0.824	0.615	0.125	0.304
Without Interaction (Coe.) REV	1.517	-24.938	-12.670	-42.840	-25.957	10.615	13.998	19.914	8.309	17.777
P-Value REV	0.704	0.004	0.003	0.002	0.353	0.235	0.201	0.310	0.191	0.171
Without Interaction (SE) EXP	3.379	7.112	3.402	11.151	20.940	7.410	9.183	18.030	4.650	9.490
Wihtout Interaction (SE) REV	3.974	8.364	4.000	13.113	24.630	8.710	10.810	21.230	5.480	11.160
METHOD	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
OBS	59.000	59.000	59.000	59.000	47.000	58.000	59.000	56.000	38.000	38.000
COUNTRIES	59.000	59.000	59.000	59.000	47.000	58.000	59.000	56.000	38.000	38.000

	Poverty headcount ratio at $6.85 a day (2017 PPP)	Poverty gap at $2.15 a day (2017 PPP) (%)	Poverty gap at $3.65 a day (2017 PPP) (%)	Poverty gap at $6.85 a day (2017 PPP) (%)	Access to electricity (% of population)	CO2 emissions (metric tons per capita)	CO2 emissions (kg per 2021 PPP $ of GDP)	School enrollment, secondary (% gross)	School enrollment, tertiary (% gross)	Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate)
Without Interaction (Coe.) EXP	-41.322	-1.417	-7.448	-22.011	-11.617	-2.363	-0.134	20.464	3.623	-20.311
P-Value EXP	0.013	0.392	0.087	0.016	0.232	0.495	0.235	0.222	0.882	0.064
Without Interaction (Coe.) REV	45.268	1.179	7.579	23.066	23.285	-0.873	0.152	13.305	9.728	29.711
P-Value REV	0.021	0.544	0.137	0.031	0.440	0.830	0.251	0.497	0.734	0.023
Without Interaction (SE) EXP	15.900	2.120	4.265	8.831	9.592	3.436	0.112	20.336	24.185	10.732
Wihtout Interaction (SE) REV	18.800	2.500	5.016	10.385	11.280	4.041	0.131	24.082	28.439	12.621
METHOD	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
OBS	38.000	38.000	38.000	38.000	59.000	59.000	59.000	53.000	54.000	59.000
COUNTRIES	38.000	38.000	38.000	38.000	59.000	59.000	59.000	53.000	54.000	59.000

We did test for multicollinearity among all of our independent variables. We did this through a VIF test, finding that none of our independent variables had an unnaturally high VIF score. This validates that our results are valid. Here is the equation we used:

$Y = \beta 0 + \beta 1\ X1 + \beta 2\ X2 + \ldots + \beta k\ Xk + \varepsilon$ (Equation 2.) Where $\beta 0$ is a constant and ε is the error term.

$VIF = 1 / (1 - R\ 2)$ (Equation 3.)

This equation, which is also defined as 1/(tolerance), will output a number, with < .25 and > 10 indicating high multicollinearity. These results are presented in a later section. Their results are presented in Table 2.

Results

Our VIF test returned above-average multicollinearity for both corruption and the rule of law returning values of 5 and 6 respectively. While these values are higher than normal, we decided to leave them as control variables because they were not greater than our upper bound of 10.

Table 2 reports our benchmark estimates for all five categories of sustainable development variables for both fiscal and expenditure decentralization. A statistically significant p-value is a < .1, and all of the p-values are presented in Table 2. The variety in the 59 countries selected allows us for a nuanced analysis of how fiscal decentralization impacts sustainability across different political contexts. Negative relationships show there should be less involvement from the central government, while positive relationships show that there should be more involvement from the central government. We found significantly positive results in the health-related variables section for infant mortality, neonatal mortality, mortality under 5, and fiscal expenditure decentralization (less decentralization).

Additionally, there were significant negative health-related results for infant mortality, neonatal mortality, mortality under 5, and fiscal revenue decentralization (more decentralization). These results show an inverse relationship between revenue and expenditure decentralization, something that we did not hypothesize. (Table 2)

Fiscal decentralization also showed a significant impact on variables following economic development variables. We found a significant positive relationship between the poverty headcount ratio at $6.85 a day and the poverty gap at $6.85 a day with fiscal revenue centralization (less decentralization). In contrast, we found a significant negative relationship between the poverty headcount at $6.85 a day, the poverty gap at $3.65 a day, and the poverty gap at $6.85 a day with fiscal expenditure decentralization (more decentralization). (Table 2)

Social variables also had significant impacts on fiscal decentralization. Revenue decentralization (less decentralization) was positively associated with female labor force participation (ILO estimate), while expenditure decentralization (more decentralization) showed a significant negative relationship with female labor force participation (ILO estimate). (Table 2)

Finally, we found no significant relationships between the educational and the environmental categories with fiscal decentralization. However, this makes sense as environmental success is dependent on private industry, and education is invested differently across different countries. (Table 2)

All of these OLS regression results are controlled for by a set of 7 variables that may interfere with the achievement of sustainable development goals. All 7 of these variables, and fiscal expenditure/revenue decentralization have been tested for multicollinearity, finding that there were no significant issues. Beyond economic implications, sustainability has ethical significance, particularly in protecting future generations. Decentralized governments with strong local governments allow countries to create tailored policies addressing specific sustainability goals and challenges.

Discussion

These findings highlight the complex relationship between fiscal decentralization and sustainable development outcomes. The inverse relationship between revenue and expenditure decentralization further emphasizes the need for a greater understanding of this relationship. Revenue decentralization allows local governments to generate and control financial resources, thereby fostering responsiveness to regional needs. On the other hand, greater centralization enables sweeping and coordinated federal policy, creating an equitable distribution of resources, especially in sectors like healthcare. These tradeoffs are evident in our results, demonstrating the need for both a strong federal and local government. For instance, countries like the United States have a strong decentralized government, and this is reflected in their ability to create strong regional policies. Conversely, centralized governance, seen in countries like France, allows for sweeping national policy implementation, leading to very different results for different variables of sustainable development.

Our analysis also reveals that revenue decentralization (less decentralization) is positively associated with poverty reduction (exemplified by the poverty headcount ratio and the poverty gap). This may reflect the failure of central governments to distribute resources across regions to ensure that disadvantaged areas gain more support. In contrast, expenditure decentralization (more decentralization) empowers local governments to spend directly on specific areas, which is ben eficial in some instances. However, they may exacerbate inequalities if resources are misused.

Beyond economic implications, sustainability has a broader ethical significance, especially as we consider future generations. Decentralized government, with strong local institutions,

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enables direct addresses with tailored policies to help sustainable development. However, centralized government can provide the coordination and strength to tackle large-scale issues. This is evident in health care and environmental protection, things that require uniform policies. The choice between decentralization and centralization involves important tradeoffs that addict both short-term outcomes and long-term sustainable success.

Conclusion

Fiscal Decentralization has been shown to have a major impact on economic outcomes in countries around the world. Although studies have mostly focused on its impact on economic outcomes, new research has begun to be produced evaluating the impact of fiscal decentralization on sustainable development.[11,22] Jumping off these insights, this research paper analyzes fiscal expenditure and revenue decentralization's impact on sustainable development variables in a macro context. Our empirical results show that fiscal decentralization is significantly associated with multiple sustainable development variables. Our findings suggest that decreasing fiscal revenue decentralization (higher centralization) is positively correlated with female labor force participation (ILO estimate), the poverty headcount ratio at \$6.85 a day, and the poverty gap at \$6.85 a day while more centralization was negatively correlated with infant mortality rate, neonatal mortality rate, and mortality rate under 5. Our results also show that decreasing fiscal expenditure decentralization (higher centralization) is positively associated with infant mortality rate, neonatal mortality rate, and the mortality rate under 5. While it was negatively associated with female labor force participation (ILO estimate), the poverty headcount ratio at \$6.85 a day, and the poverty gap at both \$3.65 a day and \$6.85 a day. These results occurred while controlling for log-shifted GDP per capita, population size,% of urban population, level of democracy, corruption, rule of law, and trade openness. We provided robustness checks through VIF tests, finding that none of our variables had high multicollinearity. Our findings suggest that countries should adjust their level of decentralization to cope with what categories their country is struggling in as a whole, with female labor force and poverty gap on one side of the spectrum, and mortality rates on the other. We cannot conclude that fiscal decentralization is necessarily a bad or good thing for sustainable development.

Multiple studies have shown the macro relationship between fiscal decentralization and sustainable development, this study shows that some variables are not significantly correlated with fiscal decentralization, possibly skewing the results of past studies. This robust approach gives insight to lawmakers on how to manage fiscal decentralization in their countries and thus should impact future policy decisions about fiscal decentralization and how they affect SDGs. Although we have demonstrated robust conclusions about fiscal decentralization and sustainable development, many things are beyond the scope of this paper. First, we have only run an OLS regression analysis controlling for a handful of variables. There are more robust regressions that can and should be run on this and other datasets. We also had issues with moderately high multicollinearity. This dataset was also limited to data from 2020. In the future, there should be more comprehensive datasets created and tested using the methodology from this paper. Finally, while evaluating 59 countries from around the globe, specific case studies from countries would be beneficial to understanding the impact of policy and their outcomes in SDGs.

Future research could also benefit from more advanced and in-depth econometric techniques, such as panel data instrumental variable regressions or case studies of more specific countries across the globe. Expanding the time frame beyond just one year could also provide more insight into this topic.

Furthermore, exploring and controlling how fiscal federalism affects regional inequalities may help clarify its role in achieving sustainable development. This paper finds the vast difference between revenue and expenditure decentralization and its effect on sustainable development variables, and it also finds what groups of variables are not statistically affected. However, this research paper skims the surface of an issue that should be investigated for its implications not only in policy today, but for future endeavors as we try to build a more sustainable world.

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Appendix

List of 59 Countries: Albania, Armenia, Australia, Austria, Belarus, Belgium, Bosnia and Herzegovina, Brazil, Canada, Chile, China, Colombia, Costa Rica, Croatia, Czechia, El Salvador, Estonia, Finland, Georgia, Germany, Guatemala, Hungary, Iceland, Indonesia, Israel, Italy, Japan, Kazakhstan, Kenya, South Korea, Latvia, Lithuania, Mauritius, Mexico, Moldova, Mongolia, Nepal, Netherlands, North Macedonia, Paraguay, Peru, Portugal, Russia, Rwanda, Senegal, Serbia, Somalia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States of America, Uzbekistan

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