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Abstract

In this paper we ask when does fiscal decentralization (FD) promote inclusive growth (IG), with this latter defined as sustained increases in average income combined with broad-based access to economic opportunities and reductions in poverty and inequality. To research this question, we use a panel of 69 countries from 1996 to 2017 and construct a composite inclusive growth index (IGI) capturing both income and non-income dimensions. Fiscal decentralization is measured using the Regional Authority Index (RAI), which captures de-facto subnational autonomy across fiscal and policy dimensions. Our results provide three key insights. First, greater subnational autonomy leads to higher IG. This finding is robust across alternative identification strategies, including GFI-based IV, lagged decentralization specifications, system GMM, and Lewbel IV estimators, as well as to alternative measures of IG and fiscal decentralization. Second, institutional quality amplifies these gains: stronger governance translates local discretion into broader opportunity creation and improved income distribution. Third, the effects are non-linear: we find an inverted-U relationship between overall subnational autonomy and IG, indicating that benefits peak at moderate levels and diminish as coordination costs and fragmentation rise. These results point to several important policy implications: degree matters up to some point but design matters more, and thus effective decentralization should prioritize genuine subnational decision rights and institutional capacity, while avoiding over-delegation that has the potential to erode the benefits of scale and effective coordination.

Keywords: inclusive growth, fiscal decentralization, subnational autonomy, regional authority index, institutional quality, non-linear effects

JEL Codes: H71, H72, H73, H77

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1 Introduction

Since the classic contributions of fiscal federalism (Musgrave, 1959; Oates, 1972; Olson, 1969), fiscal decentralization (FD) has been studied extensively for its effects on economic growth, inequality, and poverty. While the estimated impacts vary and are conditional on factors such as adequate design and institutional quality, theory and much of the empirical evidence point to significant potential net benefits, especially when decentralization confers genuine subnational fiscal autonomy (rather than merely larger fiscal sharing) and when subnational governance capacity is adequate (Brennan & Buchanan, 1980; Sepúlveda & Martínez-Vázquez, 2011; Canavire-Bacarreza et al., 2020; Siburian, 2022; Feky et al., 2023).

Building on these contributions, we recast the analysis to ask: When does decentralization lead to inclusive growth outcomes? Standard income aggregates, in particular economic growth, mask who benefits from these outcomes and miss critical non-income dimensions. Accordingly, the Stiglitz–Sen–Fitoussi Commission (2009) called for metrics beyond GDP that incorporate information on inequality, health, education, and jobs. Drawing on Ali and Son (2007), Ali and Zhuang (2007), and Ianchovichina and Lundstrom (2009), in this paper we define inclusive growth (IG) as sustained increases in average income together with the creation of, and equitable access to, economic opportunities (for example, productive employment), alongside broad-based reductions in poverty and inequality and improved access to essential services. Theoretically, fiscal decentralization can support IG as it can raise productivity and growth through more efficient resource allocation and better tax-mix choices. Moreover, IG reduces poverty and inequality through targeted local spending and improved basic service delivery. These mechanisms operate through improved information, accountability, and interjurisdictional competition, which collectively incentivize innovation and responsiveness to local needs. However, the implied lower levels of fiscal resources of central governments may jeopardize some otherwise effective redistribution programs (Tselios et al., 2012).

Against this backdrop, in this paper we examine whether greater FD translates into higher IG and, in doing so, address two additional issues that remain underexplored in the literature. First, we investigate whether institutional quality conditions affect the decentralization-IG relationship, potentially amplifying or constraining its effects. Second, we assess whether the impact of FD on

IG is non-linear, with marginal gains tapering beyond a threshold level of decentralization (Hooghe et al., 2016; Ianchovichina & Lundstrom, 2009; von Braun & Grote, 2000).

Two strands of fiscal federalism or decentralization theory motivate these questions. Classic or "first-generation" fiscal federalism argues that shifting real authority to governments closer to constituents improves allocative efficiency by leveraging superior local information and matching policies to heterogeneous local preferences (Musgrave, 1959; Oates, 1972; Olson, 1969). A more recent, accountability-focused strand of "second-generation" fiscal federalism emphasizes that even without benevolent planners, decentralized authority can discipline officials because proximity improves monitoring and yardstick comparisons across jurisdictions, allowing voters to better sanction poor performance and reward competence (Seabright, 1996; Tommasi & Weinschelbaum, 2007). At the same time, other researchers have cautioned that without institutional checks, decentralization can amplify disparities, weaken macro-fiscal coordination, and invite elite capture (Prud'homme, 1995; Tanzi, 1996; Treisman, 2006, 2007).

These theoretical underpinnings provide a direct rationale for examining the role of subnational autonomy through an inclusive-growth lens. Because IG is concerned with sustained expansion in income and broad-based improvements in poverty, inequality, and access to services, authority over policy scope and fiscal instruments at the subnational level may matter directly through pro-poor programs in health, education, and social protection services and indirectly through productivity and employment (von Braun & Grote, 2000; Ianchovichina & Lundstrom, 2009). In this view, what matters is not decentralization, per se—as traditionally proxied, for example, by subnational expenditure/revenue shares—but whether subnational governments hold true, enforceable discretion over tax bases/rates and spending priorities (fiscal autonomy) and the scope to tailor policies (policy autonomy). Traditional measures of decentralization based on expenditure and revenue shares cannot capture many of these decision rights as policy-making and implementation authority do not always show up in those fiscal data. The Regional Authority Index (RAI) database addresses these concerns by directly coding self-rule, shared-rule, and fiscal and policy autonomy dimensions, capturing de facto authority that is essential for accountability and policy fit (Hooghe et al., 2016). Thus, in this paper we adopt the RAI database to measure the actual levels of subnational autonomy.

Conceptually and empirically, the autonomy–inclusion link is conditional. First, de facto decision rights over tax bases/rates and spending priorities should enhance accountability and alignment with local needs, channeling resources toward human capital and safety-net programs (Besley & Case, 1995; von Braun & Grote, 2000; Hooghe et al., 2016). Hence, autonomy matters more than fiscal shares per se; in this sense some previous empirical studies have found that distributional gains are more likely when subnational discretion is real (Goerl & Seiferling, 2014). Second, institutional quality can amplify these gains. Greater administrative capacity, rule of law, and integrated party linkages curb elite capture and improve implementation, allowing local discretion to translate into broad-based welfare gains (Neyapti, 2006; Enikolopov & Zhuravskaya, 2007; Kyriacou, Muinelo-Gallo & Roca-Sagalés, 2016; Nakatani et al., 2022). Third, the relationship may be non-linear. Beyond a threshold, additional devolution can weaken coordination and erode scale economies, weakening the redistributive capacity of central government and reducing inclusiveness. Prior work has documented the presence of such inverted-U patterns for decentralization and different forms of economic performance (Thiessen, 2003; Akai, Nishimura & Sakata, 2007; Lessmann, 2012; Canare & Francisco, 2019; Nursini & Tawakkal, 2019; Mladenovska & Tashevska, 2024).

In this paper we provide novel evidence that subnational autonomy drives IG. First, RAI has a significant positive effect on IG, consistent with theories that emphasize accountability and policy fit under real local discretion (Oates, 1972; Besley & Case, 1995) and with empirical work linking autonomy to improved distributive outcomes when discretion is genuine (Goerl & Seiferling, 2014). This also aligns with findings that greater local discretion over revenues and policy scope support human-capital investment and poverty reduction when subnational capacity is adequate (Habibi et al., 2003; Cavalieri & Ferrante, 2016; Siburian, 2022). This result is robust across alternative identification strategies—including GFI-based IV, lagged decentralization measures, system GMM, and Lewbel IV estimators—as well as to alternative measures of IG and fiscal decentralization. Second, institutional quality positively moderates the subnational autonomy–IG relationship, echoing evidence that better governance strengthens decentralization's benefits by curbing elite capture and improving the quality of public service delivery (Neyapti, 2006; Kyriacou, Muinelo-Gallo & Roca-Sagalés, 2016; Sow & Razafimahefa, 2015; Nakatani et al., 2022). Finally, we find an inverted-U relationship between RAI and IG: subnational autonomy raises inclusiveness up to a threshold level, after which further decentralization dampens it,

mirroring other non-linearities evidenced in the literature (Thiessen, 2003; Akai et al., 2007; Lessmann, 2012; Canare & Francisco, 2019; Nursini & Tawakkal, 2019; Mladenovska & Tashevska, 2024).

The rest of the paper is organized as follows. Section 2 reviews the relevant literature on fiscal decentralization's effect on growth, inequality, and poverty. Section 3 presents the theoretical framework and hypotheses. Section 4 describes the data and Section 5 the methodology and models used in the analysis. Section 6 reports and interprets the empirical results, with Section 7 discussing additional robustness checks. Section 8 concludes with the main implications and conclusions.

2 Literature Review

This section reviews the relevant literature on fiscal decentralization and economic growth, poverty, and inequality to clarify the theoretical mechanisms underlying the impact of decentralization on inclusive growth. Because IG encompasses economic expansion, poverty reduction, and equitable income distribution, understanding these relationships is essential for building our theoretical framework. Examining how fiscal decentralization influences each of these outcomes separately helps clarify the mechanisms through which it can foster, or hinder, inclusiveness in overall growth.

2.1 Fiscal Decentralization and Economic Growth

Prior research on fiscal decentralization and economic growth provides some of the basis for examining IG, as economic growth is a necessary precondition for assessing whether that growth is inclusive. The theoretical effects of fiscal decentralization on growth occur directly through increased efficiency and indirectly through channels such as macroeconomic stability, which can result in either positive or negative outcomes. The primary argument for a positive impact is rooted in the classic theory of fiscal federalism, which posits that decentralization enhances the economic efficiency of the public sector by making use of better information about local conditions, preferences, and needs (Musgrave, 1959; Oates, 1972; Olson, 1969). Efficiency is further enhanced through "Tiebout sorting," where residents migrate to localities that align with their needs for public goods, services, and local tax rates (Tiebout, 1956). This increase in efficiency, supported by greater fiscal autonomy, may increase productivity and economic growth (Oates,

1993; Brueckner, 2006).[1] Second-generation fiscal federalism emphasizes incentive effects, arguing that decentralization fosters markets and restrains central-government overreach through intergovernmental competition and fiscal accountability (Brennan & Buchanan, 1980; Aschauer, 1989; Weingast, 1995). Competition and accountability can also stimulate innovation and efficiency in the provision of public goods (Salmon, 1987; Seabright, 1996; Oates, 1999; Martinez-Vazquez & McNab, 2003; Lockwood, 2005).[2]

However, decentralization can also have adverse consequences for growth. Decentralization without strong equalization schemes may exacerbate regional disparities as resources concentrate in wealthier localities, limiting aggregate performance (Prud'homme, 1995; Thiessen, 2003). Additionally, fiscal decentralization can complicate macroeconomic stability[3] due to fiscal coordination problems, limit the benefits of economies of scale and scope, and increase corruption due to weak oversight and local elite capture (Tanzi, 1996; Prud'homme, 1995; Bardhan and Mukherjee, 2000).[4] Each of these factors would have negative consequences on economic growth.

Empirical findings remain mixed. Many cross-country studies identify positive effects of fiscal decentralization on growth. Hanif et al. (2020) find that decentralization raises growth in developing countries, which is amplified by better institutional quality and low corruption. Similarly, Sima et al. (2023) show that both revenue and expenditure decentralization positively affect GDP per capita across OECD and African countries. Canavire-Bacarreza et al. (2020) likewise identify positive effects using the Geographic Fragmentation Index (GFI) as IV, especially for developed countries. Iimi (2005) similarly finds that expenditure decentralization positively affects growth in a large cross-section of economies, and Meloche et al. (2004) find positive effects of subnational revenue autonomy on growth in European transition countries.

[1] Specifically, Oates (1993) argues that local government policies on infrastructure and human capital, when tailored to local preferences and conditions, are more likely to promote economic development than centrally determined policies.

[2] However, negative excessive tax competition may result in "runs to the bottom" and inadequate provision of public goods (Wilson, 1986; Zodrow and Mieszkowski, 1986; Strumpf, 1999).

[3] However, Gramlich (1993) argues that decentralized systems can achieve macroeconomic stability more easily when economic shocks are asymmetric, and Treisman (2000) suggests that federal systems are associated with more stable inflation. Lago-Peñas et al. (2020) also find that decentralized fiscal systems, if supported with proper institutional design (e.g., borrowing rules, subcentral fiscal constraints), do not necessarily undermine fiscal stability.

[4] There are also counterarguments: local officials are more visible to their constituents, making corrupt behavior more noticeable and, therefore, less likely compared to officials at the central level of government (Martinez-Vazquez and McNab, 2003)

Other studies find negative effects, such as that by Davoodi and Zou (1998), an earlier cross-country analysis, and Baskaran and Feld (2013), who examine 23 OECD countries. Several papers find contrasting effects between expenditure and revenue decentralization. Pasichnyi et al. (2019) observe that revenue decentralization can depress growth through distortionary taxation, whereas expenditure decentralization stimulates it due to productive local spending. Rodriguez-Pose & Kroijer (2009) similarly find positive medium-term effects for revenue decentralization but negative ones for expenditure in Central and Eastern Europe.

A number of studies find that the relationship is non-linear or conditional. Thiessen (2003), Akai et al. (2007), and Mladenovska and Tashevska (2024) find an inverted U-shaped relationship, suggesting that moderate decentralization maximizes spillovers while excessive decentralization reduces efficiency and coordination. Gemmell et al. (2013) find that growth improves when spending and revenue decentralization are closely aligned, while Filippetti and Sacchi (2016) show that fiscal decentralization leads to higher growth when administrative and political decentralization are also present.[5]

Overall, survey papers such as Martinez-Vazquez et al. (2016) and Shrestha and Hankla (2025) that have done a thorough survey on the topic are cautiously optimistic about decentralization's net impact on growth, especially under sound institutional and fiscal frameworks. Countries with stronger institutional and policy frameworks tend to experience clearer growth gains from decentralization, while others face coordination failures and macro-fiscal instability.

2.2 Fiscal Decentralization and Poverty

Examining fiscal decentralization's impact on poverty adds another piece to the puzzle of fiscal decentralization and IG, as growth is inclusive when poverty is declining. While classic fiscal federalism posits that decentralization improves allocative efficiency by tailoring public goods to local preferences (Oates, 1972), subsequent studies extend this argument to poverty alleviation. Proponents argue that the informational advantages of local governments allow for better targeting of social safety nets and more effective delivery of services critical to the poor (von Braun and Grote, 2000; Jutting et al., 2004).

[5] Several studies, such as that by Woller and Philipps (1998) and Thornton (2007), report no significant relationship.

Another conceptual framework for understanding fiscal decentralization's impact on poverty originates from Besley's (1997) two approaches to poverty reduction. The technocratic approach focuses on programs that directly transfer resources to the poor, while the institutional approach examines political power and administrative competence that impact service delivery. Decentralization can have positive implications for both approaches (von Braun and Grote, 2000).

There are different mechanisms through which fiscal decentralization can have distinct, direct effects on poverty. Local governments, being closer to citizens and better informed about their needs, can allocate resources more effectively to pro-poor programs, provide targeted transfers, and deliver essential services such as health, education, and infrastructure more efficiently, thereby directly and indirectly alleviating poverty (Martinez-Vazquez, 2001; Hussain et al. 2021; Digdowiseiso, 2022; Hayek in Ostrom et al., 1993). These benefits, however, depend heavily on governance quality, institutional capacity, and the degree of fiscal autonomy (Jutting et al., 2005; Agyemang-Duah et al., 2018; Hussain et al., 2021). Decentralization can also promote participatory governance by empowering the poor and strengthening accountability, thereby improving local responsiveness and service delivery (von Braun and Grote, 2000; Crook & Sverrisson, 2001; Mansuri and Rao, 2004). However, meaningful participation requires a minimum level of education and empowerment, often limited in developing countries.[6] Political and administrative decentralization have also been highlighted as necessary preconditions for fiscal decentralization to lead to pro-poor spending (von Braun & Grote, 2000; Crook, 2003).[7]

Conversely, decentralization may worsen poverty when there is elite capture or institutions are weak, excluding the poor from accessing necessary services (Bardhan & Mookherjee, 2000; Bashaasha et al., 2011). It may also weaken central redistributive functions or lead to regressivity in taxation (von Braun & Grote, 2000; Sepulveda & Martinez-Vazquez, 2011; Digdowiseiso, 2022). A priori, some other factors may have either positive or negative implications on poverty. For one, corruption can be a critical variable. The overall empirical evidence suggests that fiscal

[6] Studies show that the benefits of decentralized social programs are often captured by local elite in heterogeneous communities and underdeveloped rural economies (Bardhan, 1999; Galasso and Ravallion, 2000). Case analyses of various countries also reveal that decentralization tends to alleviate poverty in nations with high literacy rates (Jutting et al., 2005).

[7] For example, low-income countries often face challenges in raising sufficient public revenue, designing effective tax systems, and ensuring that limited public resources are allocated to pro-poor activities, such as education and health (von Braun & Grote, 2000).

decentralization tends to reduce corruption by enhancing accountability, though the effect is conditional on institutional capacity and can reverse when excessive fragmentation or weak oversight prevail (Martinez-Vazquez et al., 2016). Other indirect channels through which fiscal decentralization may influence poverty, with potentially varying effects, include macroeconomic factors such as economic growth, macroeconomic stability, and government size, as well as the size and types of intergovernmental transfers (Martinez-Vazquez and Sepulveda, 2011).[8]

Empirical evidence is mostly derived from single-country studies and from examinations of indirect effects. Sepulveda and Martinez-Vazquez's (2011) analysis of developing countries, the Moche et al. (2014) study of South Africa, and the Shahzad & Yasmin (2016) study of Pakistan find a negative impact of fiscal decentralization on poverty. Subnational governments may redirect transfers for purposes other than poverty alleviation. They may also lack the capacity to collect taxes or implement pro-poor policies effectively. Decentralization can also limit the central government's capacity to fund long-term poverty reduction policies. Other studies identify an inverted U-shaped relationship, showing that decentralization may initially reduce poverty but can exacerbate it beyond a certain level, due to factors such as weakening coordination or oversight (Canare & Francisco, 2019; Nursini & Tawakkal, 2019).

At the same time, growing evidence points to positive effects, such as the Ramirez et al. (2017) study of property-tax decentralization in Colombia, Siburian (2022) on expenditure decentralization in Indonesia, and Hussain et al. (2021) in Pakistan, who find both direct and indirect positive effects. These positive effects are amplified with better institutional and governance quality. Similarly, Tselios and Rodriguez-Pose (2022) find that fiscal, political, and administrative decentralization reduce poverty in European countries, especially in those with high governance quality. Positive outcomes were also shown in earlier country case studies, such as that of Bardhan and Mookherjee's (2003) work on India.

[8] Another relevant perspective for understanding fiscal decentralization's effect on poverty centers on the theories of subnational governments' role in redistributive policies. The positive versus negative perspectives on this role are largely shaped by the interjurisdictional mobility of populations and productive factors. Those holding a negative view assume that mobility is present, whereby migration of the rich and poor induced by local tax policies creates economic inefficiencies, ultimately rendering redistributive policies ineffective (Stigler, 1957; Musgrave, 1959; Oates, 1968, 1972; Brown & Oates, 1987). Conversely, when mobility is imperfect or limited, local governments' redistributive policies can become more effective and efficient (Pauly, 1973).

Empirical studies that explore fiscal decentralization's effect on education, healthcare, and infrastructure services also have a bearing on poverty reduction. Based on a survey of empirical studies, Martinez-Vazquez et al. (2016) conclude that fiscal decentralization generally improves education and health service delivery through increased local responsiveness and spending efficiency, especially where local capacity and governance are strong. Similarly, Shrestha and Hankla (2025) conclude that decentralization can strengthen the provision of education, healthcare, and infrastructure when accompanied by adequate administrative capacity, fiscal autonomy, and intergovernmental coordination.

Overall, the empirical evidence on the impact of fiscal decentralization on poverty remains mixed. However, the literature suggests that positive effects are more likely to materialize under favorable institutional and governance conditions at the subnational level.

2.3 Fiscal Decentralization and Inequality

Lastly, the literature on fiscal decentralization's impact on income inequality completes the conceptual basis for our analysis, as IG can be understood as faster income gains among poorer groups that lead to a more equitable income distribution. The theoretical arguments regarding fiscal decentralization's impact on income inequality largely parallel those on poverty. Based on the classic fiscal federalism theory (Oates, 1972, 1993), subnational governments, possessing better knowledge of local needs, can allocate resources more effectively. Increased citizen participation and accountability may also mitigate corruption and elite capture, incentivizing more responsible and equitable tax and expenditure policies (Bardhan, 2002; Le Gales, 2002; Brenner, 2004). Interjurisdictional competition can further stimulate innovation and efficiency, leading to reduced inequality (Qian & Weingast, 1997; Canare et al., 2020).

Conversely, fiscal decentralization can exacerbate inequality when subnational governments differ in administrative or fiscal capacity (Prud'homme, 1995; Bahl, 1999; Qiao et al., 2008). Moreover, decentralization can diminish the central government's ability to implement redistributive policies (Rodríguez-Pose & Gill, 2004; Sepulveda & Martinez-Vazquez, 2011). In developing countries, these challenges may be compounded by weak institutions and entrenched local elite power (Bardhan, 2002). Additionally, wealthier jurisdictions with broader tax bases may provide better services or maintain lower tax rates, thereby intensifying regional disparities (Prud'homme, 1995; Lessmann, 2009). Over time, such dynamics can reinforce the advantages of richer regions that

provide better education and health services, producing cumulative gains in human capital and lifetime earnings (Canavire et al., 2020).

Empirical evidence on fiscal decentralization's impact on inequality remains mixed, with studies having found positive, negative, or context-dependent results. However, a rather consistent finding is that higher levels of revenue decentralization tend to have a negative effect on income distribution, although the effect can be mitigated or even reversed depending on other factors such as institutional quality, good governance, and the level of economic development.

Starting with the studies with negative results, Sacchi and Salotti (2014) analyze 23 OECD countries and find that greater revenue decentralization leads to increased interpersonal inequality, particularly when subnational governments utilize their higher tax autonomy.[9] Similarly, Pietrovito et al. (2023) find that intraregional income redistribution declines with greater revenue decentralization. Other studies find that fiscal decentralization reduces inequality. Tselios et al. (2012) examine Western European countries and find that fiscal decentralization reduces interpersonal inequality within regions; however, this effect diminishes in wealthier regions. Similarly, Stossberg et al. (2016) analyze OECD countries and find that fiscal decentralization is relatively weakly associated with reduced income inequality.

Several studies suggest that fiscal decentralization's impact on inequality depends on external factors such as economic development, governance quality, and government size. Sepulveda and Martinez-Vazquez (2011) study developed and developing countries and find that decentralization reduces income inequality when the overall government budget[10] exceeds 20 percent of GDP.[11] Similarly, Goerl and Seiferling (2014) find that expenditure decentralization reduces income inequality when the government sector is sufficiently large and subnational governments have

[9] Interestingly, these authors also find no adverse effects (or inconclusive results) in the case of expenditure decentralization on income distribution; expenditure decentralization is of course much more common in decentralized systems, especially in developing countries.

[10] Measured as government share of real GDP per capita; scale from 0 to 100 (Heston et al., 2006)

[11] Subnational governments generally have limited control over major tax bases but may help reduce inequalities through expenditure programs. Sepulveda and Martinez-Vazquez (2011) suggest that with a larger government size, subnational governments can implement effective expenditure programs to reduce inequality, complemented by the central government's sizable redistributive efforts. Conversely, in cases where the government sector is relatively small, greater decentralization may lead to the diversion of scarce funds initially allocated to redistributive programs.

adequate revenue autonomy. Neyapti (2006) finds that revenue decentralization improves income distribution only when paired with good governance.

3 Theoretical Framework and Hypotheses

Based on the literature reviewed above, we argue that higher levels of fiscal decentralization under "favorable conditions" lead to more inclusive economic growth. This is because the mechanisms of fiscal decentralization, including greater efficiency, accountability, and responsiveness, are enhanced under these favorable conditions, which can directly and indirectly reduce poverty and inequality while sustaining growth. These favorable conditions include (i) genuine subnational autonomy and discretion over expenditure and taxation, (ii) sound institutional quality and good governance, and (iii) a moderate level of decentralization that avoids excessive fragmentation or loss of scale economies.

3.1 Subnational Fiscal Autonomy and Inclusive Growth

When subnational governments possess meaningful discretion over spending composition and revenue instruments, they are better positioned to design fiscal policies that respond to local economic conditions and development needs. First, decentralization can support growth by allowing local governments to tailor tax policies, investment incentives, and infrastructure spending to local circumstances, which in return can foster private investment and generate employment (von Braun & Grote, 2000; Habibi et al., 2003; Filippetti & Sacchi, 2016; Chen and Martinez-Vazquez, 2024). With greater discretion over tax bases and rates and lower dependence on intergovernmental transfers, subnational governments face stronger accountability incentives, potentially encouraging the adoption of tax policies that attracts investments and expand employment opportunities.

Second, control over expenditure allows subnational authorities to innovate in the provision of local public goods—such as health, education, and labor market programs—that can shape human capital formation, labor force participation, and increase access to economic opportunities (Cavalieri & Ferrante, 2016). Additionally, it can motivate subnational governments to be efficient in budget allocation and strategize long-term planning, channeling resources toward programs that build human capital and local infrastructure. These effects are grounded in subnational governments' superior information about local preferences and are often reinforced by yardstick

competition across jurisdictions, which incentivizes better performance and service delivery (Salmon, 1987; Besley & Case, 1995; Seabright, 1996).

Because IG explicitly combines income growth with equity in distribution, improvements in welfare and economic opportunities, and access to basic services, subnational autonomy—as captured by the Regional Authority Index (RAI)—provides an adequate measurement of the necessary policy flexibility to achieve these outcomes. Consequently, the ability to tailor the 'policy mix' to local needs and preferences should translate into higher IG.

Hypothesis 1: Greater subnational autonomy, as measured by RAI, will lead to higher inclusive growth.

3.2 Moderating Effect of Institutional Quality

A consistent finding across the decentralization literature is that institutional quality conditions both the sign and size of decentralization's effects. Stronger institutions convert local knowledge into better targeting and delivery by improving planning, procurement, staffing, and audit, while also limiting political elite capture and strengthening fiscal accountability (Neyapti, 2006; Kyriacou, Muinelo Gallo, & Roca Sagalés, 2016; Sow & Razafimahefa, 2015; Nakatani et al., 2022). In the context of IG, institutional quality is particularly important as it can determine whether the policy space created by subnational autonomy can be translated into effective outcomes.

Political integration and oversight across tiers (e.g., strong party linkages or shared-rule features also indexed in RAI) likewise amplify the benefits of decentralization (Enikolopov & Zhuravskaya, 2007; Ponce-Rodriguez et al., 2018; Bizzarro et al., 2018). In particular, empirical studies that specifically study the effect of subnational autonomy (using measurements such as RAI or subcomponents of RAI) increasingly show that better governance or institutions amplifies the positive impact on growth, poverty, and inequality (Filippetti and Sacchi, 2016; Muringani et al., 2019, 2022; Tselios and Rodriguez-Pose, 2022).

Overall, these findings suggest that higher institutional quality facilitates the effective implementation of the right "policy mix" enabled by subnational autonomy across both the income and non-income pillars of the inclusive growth index (IGI).

Hypothesis 2: Higher institutional quality strengthens the positive effect of subnational autonomy on inclusive growth.

3.3 Non-linear Relationship between Subnational Autonomy and Inclusive Growth

While increases in subnational autonomy may improve accountability, efficiency, fit, and innovation, very high levels of devolution can lead to coordination failures, stretched budgets resources, and undercut scale economies and can exacerbate common-pool problems or negative inter-regional fiscal competition (Prud'homme, 1995; Rodden, 2006; Treisman, 2007), all contributing to potentially dampening IG. Additionally, as decentralization has the potential to undermine the central government's redistributive policies, excessive decentralization may exacerbate this effect. Accordingly, prior cross-country evidence reports inverted-U patterns between decentralization and overall performance, suggesting the presence of diminishing marginal returns beyond a certain threshold of subnational autonomy (Thiessen, 2003; Akai et al., 2007; Lessmann, 2012; Mladenovska & Tashevska, 2024).

Hypothesis 3: Subnational autonomy exhibits a non-linear relationship with inclusive growth.

4 Data

We construct a panel data set of 69 countries from 1996 to 2017. Table 1 summarizes the descriptive statistics for all dependent and independent variables used in our empirical analysis.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Inclusive Growth Index	1219	0.53	0.16	0.15	0.90
GDP per person employed (logged)	1219	10.82	0.84	8.63	12.67
Inclusive Growth Index (Ramos et al., 2013)	932	0.68	0.09	0.35	0.86
Regional Authority Index	1219	12.85	9.93	0.00	37.72
Population (logged)	1219	16.82	1.60	13.00	21.06
Gross Capital Formation (WB)	1219	0.64	7.22	-41.12	42.50
Inflation	1219	0.39	30.32	-56.54	1003.25
Trade Openness	1219	1.82	22.94	-61.20	334.91
Credit to GDP Ratio	1219	1.46	22.44	-116.52	193.50
Political stability	1078	0.14	0.94	-2.81	1.75
Control of Corruption	1078	0.44	1.09	-1.60	2.459

4.1 Outcome Variables

4.1.1 Inclusive Growth Index

To measure IG, we construct a composite inclusive growth index (IGI) using principal component analysis (PCA). Several prior studies have used PCA to generate IGIs (Kamran et al. 2022; Osabohien et al., 2022). These papers categorize IG into multiple pillars, each capturing different dimensions of economic and social development. Drawing on the Stiglitz–Sen–Fitoussi Commission's (2009) call for metrics beyond GDP and definitions emphasizing equitable access to economic opportunities (Ali & Son, 2007; Ali & Zhuang, 2007), we incorporate both income and non-income dimensions in our index. The income component is based on GDP per capita and income inequality, measured by the Gini coefficient from the Standardized World Income Inequality Database (SWIID) (Solt, 2016, 2020). The non-income component reflects broader access to economic opportunities and human development and includes the employment-to-population ratio, the human capital index as a proxy for educational attainment, and life expectancy at birth as a proxy for health outcomes. (See appendix for further details.)

4.1.2 Alternative Inclusive Growth Indices

For robustness, we also employ two alternative IGIs: (i) GDP per person employed and (ii) the Ramos et al. (2013) composite index. Regarding the first, Raheem et al. (2016) and Adeosun and Tabash (2020) use the log of GDP per person employed, which reflects the productivity and inclusiveness of growth by linking economic performance to labor utilization. It captures how effectively labor resources are employed and whether income growth is broadly shared through employment opportunities, thereby addressing the "jobless growth" phenomenon prevalent in many developing economies (Ali & Son, 2007).[12]

The composite index by Ramos et al. (2013) addresses some of the limitations of the GDP per person employed index. Ramos et al. (2013) suggests that an IGI should not only promote economic growth but also ensure an equitable distribution of its benefits and foster broad participation in the economic process. Building on this idea, we construct an alternative index that captures two key dimensions: (i) benefit-sharing by measuring poverty and inequality and (ii)

[12] This measurement as a proxy for inclusive growth has some potential limitations(for example, the number could increase with increase in unemployment); however, it has been one of the conventional indices often used in literature and is particularly useful when employment participation is stable.

participation by measuring the employment-to-population ratio (EPR).[13] However, this index does not reflect non-income dimensions of well-being, such as health and education.

But note that our main composite IGI overcomes those limitations by incorporating measures of both equitable distribution and non-income dimensions. Furthermore, it is highly correlated with the two alternative IG measures used in the literature, discussed above (Table 2). This indicates that our main composite IGI preserves the underlying informational content of existing approaches while overcoming their limitations by explicitly incorporating both distributional equity and human development outcomes.

Table 2. Pairwise Correlations of Inclusive Growth Indices

Variables	(1)	(2)	(3)
(1) Inclusive Growth Index	1.000		
(2) GDP per person employed (logged)	0.778	1.000	
(3) Inclusive Growth Index (Ramos et al., 2013)	0.838	0.566	1.000

4.2 Fiscal Decentralization Variables

4.2.1 Regional Authority Index (RAI)

To measure our main explanatory variable, fiscal decentralization, we use the RAI, which codes regional government autonomy and authority with a composite index of two dimensions: self-rule (autonomy over institutional depth, policy scope, fiscal and borrowing autonomy, and representation) and shared-rule (regional influence over national decision-making) (Hooghe et al., 2016). Within self-rule, subindices for fiscal autonomy (discretion over tax bases and rates) and policy autonomy (scope over substantive spending domains) each closely represent revenue decentralization and expenditure decentralization. These measures better capture genuine subnational discretion and autonomy than the conventional IMF Government Finance Statistics (GFS) shares, which can record centrally mandated spending as "subnational" and shared taxes as "local revenues" even when regions lack control over bases or rates (Ebel & Yilmaz, 2002; Rodden, 2004).

[13] This index captures benefit-sharing and broad participation in the economic growth process by combining the poverty headcount ($2 a day, PPP), the Gini coefficient, and the employment-to-population ratio, and deriving the simple average of the three min-max normalized indicators (See appendix for more details).

4.3 Alternative Fiscal Decentralization Variables

For robustness, we also use an alternative proxy for fiscal decentralization: the conventional IMF GFS measures of expenditure decentralization and revenue decentralization. Expenditure decentralization here is defined as the ratio of subnational government expenditure to total general government expenditure, while revenue decentralization is measured as the share of subnational government revenue in total general government revenue.

4.4 Control Variables

In our estimations we include a set of control variables from the World Bank's World Development Indicators (WDI) to account for other potential determinants of IG. First, we control for the log of population to account for country size. Following the neoclassical growth framework, we expect a negative relationship between population size and IG.[14] Second, we include gross capital formation (as a percentage of GDP) as a proxy for domestic investment. We expect a positive coefficient, as physical capital accumulation is a fundamental driver of economic expansion and labor productivity (Mankiw, Romer, & Weil, 1992). Higher investment levels create employment opportunities, which are essential for the "participation" dimension of IG. Third, we control for inflation to reflect macroeconomic stability. While high inflation is generally seen as detrimental to the poor (Easterly & Fischer, 2001), the literature on the growth-inflation nexus is mixed. Some structuralist theories and the "Tobin effect" suggest that moderate inflation can induce a portfolio shift from money to physical capital, thereby stimulating investment and growth (Tobin, 1965). Therefore, we may observe a positive relationship if inflation reflects aggregate demand pressures rather than instability.

Fourth, we include trade openness (i.e., exports plus imports as a percentage of GDP) to capture global integration. While trade is often associated with higher aggregate growth, we expect a negative impact on *inclusive* growth. Theoretical models such as the Stolper–Samuelson theorem suggest that openness in developing countries can widen the wage gap between skilled and unskilled labor, increasing inequality (Wood, 1997). Furthermore, openness can expose vulnerable economies to external volatility, potentially undermining social welfare (Rodrik, 1998). Fifth, we

[14] A larger population can lead to a "capital dilution" effect, where limited capital is spread across more workers, potentially reducing per capita income growth (Solow, 1956). Additionally, rapid population growth can strain the capacity of governments to provide equitable public services, thereby hampering inclusivity (Klasen & Lamanna, 2009).

use domestic credit to the private sector (as a percentage of GDP) as a proxy for financial depth and access. We expect a positive relationship, consistent with the finance-growth nexus literature. A well-developed financial system lowers the cost of borrowing and relaxes credit constraints for small entrepreneurs and low-income households, thereby reducing inequality and fostering pro-poor growth (Beck, Demirgüç-Kunt, & Levine, 2007).

Finally, to proxy for institutional quality, we use control of corruption and political stability, both from the World Bank's Worldwide Governance Indicators (WGI). We expect control of corruption to have a positive effect (meaning less corruption boosts IG), as corruption distorts market mechanisms and tends to act as a regressive tax on the poor (Gupta, Davoodi, & Alonso-Terme, 2002). Similarly, we expect political stability to be positively associated with IG, as instability creates uncertainty that deters investment and reduces overall economic growth (Alesina et al., 1996).

5 Methodology

5.1 Baseline Two-way Fixed Effects Model

To estimate the association between decentralization and IG, we begin with a two-way fixed effects (TWFE) panel specification:

$$IG_{it} = \beta\, Dec_{it} + \mathrm{X}'_{it}\gamma + \alpha_i + \lambda_t + \varepsilon_{it} \quad (1)$$

where IG_{it} is the IG outcome (proxied by the IGI) for country i in year t. The variable Dec_{it} denotes our measure of decentralization, captured by the RAI, and β is identified from within-country changes in decentralization over time. Country fixed effects α_i absorb time-invariant heterogeneity (e.g., historical legacies, geography, legal origins), while year fixed effects λ_t capture common shocks (e.g., global business cycles, commodity-price movements). The vector X_{it} includes the control variables: population (log), gross capital formation, inflation, trade openness, and domestic credit to the private sector (as a percentage of GDP). We further extend the model by including measures of institutional quality as additional controls to ensure that the estimated effect of decentralization is not capturing broader improvements in governance. We use Driscoll-Kraay robust standard errors.[15]

[15] In addition to heteroskedasticity and auto correlation, which the White standard errors correct, Driscoll-Kraay robust standard errors also correct for cross-sectional dependence. For more information, see Hoechle (2007).

5.2 IV Strategy: Geographic Fragmentation Index (GFI)

The baseline TWFE does not resolve concerns that decentralization may be endogenous; for example, countries may decentralize in response to growth and distributional pressures, or unobserved political-economy factors may jointly drive both decentralization and IG. Hence, to probe the causal effect of decentralization on IG, we implement a fixed-effects instrumental-variables approach (FE-2SLS). Following the identification strategy in Canavire-Bacarreza et al. (2020), we use the geographic fragmentation index (GFI) as an instrument for decentralization; this is calculated as the weighted probability that two randomly selected individuals do not reside at similar elevations (Canavire-Bacarreza and Martinez-Vazquez, 2012). This geographic heterogeneity can shape the feasibility and incentives for devolving fiscal responsibilities, while being plausibly exogenous to short-run IG outcomes except through decentralization.[16]

Let FD_{it} denote fiscal decentralization and let GFI_i denote the geographic fragmentation index. Following the Canavire-Bacarreza et al. (2020) methodology, we estimate a Panel IV model controlling for country-specific effects (X_i), to capture time-invariant heterogeneity across geographic regions, and period-specific effects (T_t) to account for common global shocks.[17]

Thus, our estimation proceeds in two stages. In the first stage, we predict fiscal decentralization (FD_{it}) using the instrument (GFI_i), the set of control variables (X_{it}), country dummies (X), and time dummies (T_t):

$$FD_{it} = \alpha_0 + \pi_1 GFI_i + \gamma X_{it} + \vartheta X_i + \delta T_t + \varepsilon_{it} \quad (2)$$

In the second stage, we estimate the impact of the instrumented fiscal decentralization ($\widehat{FD}_{it}$) on IG (IG_{it}).

$$IG_{it} = \rho_0 + \beta^{IV} \widehat{FD}_{it} + \theta X_{it} + \mu X_i + \rho T_t + u_{it} \quad (3)$$

The coefficient β^{IV} captures the exogenous causal effect of fiscal decentralization on IG.

[16] The validity of GFI as an IV for decentralization follows from the political–economic logic that countries characterized by greater geographic fragmentation, arising from elevation heterogeneity, terrain ruggedness, and spatial dispersion, face higher coordination costs under centralized governance. Such environments historically favor the delegation of authority to subnational governments, leading to higher observed levels of regional autonomy as captured by the RAI. Empirically, Canavire-Bacarreza et al. (2020) show that geographic fragmentation is a strong predictor of decentralization arrangements across countries.

[17] As noted by Canavire-Bacarreza et al. (2020), the GFI exhibits low time variance. Consequently, using standard country fixed effects would absorb the instrument and result in perfect collinearity.

5.3 Temporal Structure: Lagged Decentralization

Because many channels linking decentralization to IG (e.g., education quality, infrastructure, local administrative capacity, private-sector responses) plausibly materialize with delays, and because contemporaneous feedback may bias β, we also estimate distributed-lag variants in which current IG is regressed on lagged decentralization:

$$IG_{it} = \beta_k \, Dec_{i,t-k} + \mathrm{X}'_{it}\gamma + \alpha_i + \lambda_t + \varepsilon_{it}, k \in \{1,3,5\} \quad (4)$$

We implement these as separate regressions for different lags, $k = 1$, 3, and 5. The lag structure serves two complementary purposes. First, it captures slow take-up effects—for example, increased subnational authority may affect education or health spending first, with improvements in human capital and earnings distribution emerging only after multiple years. Second, lagging helps partially mitigate concerns about reverse causality and contemporaneous policy responses, as IG outcomes in year t are unlikely to mechanically determine decentralization decisions adopted in earlier years, although endogeneity concerns cannot be fully ruled out.

5.4 Institutional Quality: Moderation Effect

To examine whether institutional quality conditions the effect of decentralization on IG, we estimate interaction models using governance indicators. Let PS_{it} denote political stability and CC_{it} control of corruption, measured using the Worldwide Governance Indicators (WGI).[18]

In this case, our specification is:

$$IG_{it} = \beta \, Dec_{it} + \theta \, Inst_{it} + \delta \, (Dec_{it} \times Inst_{it}) + \mathrm{X}'_{it}\gamma + \alpha_i + \lambda_t + \varepsilon_{it} \quad (5)$$

where $Inst_{it} \in \{PS_{it}, CC_{it}\}$. The interaction coefficient δ captures whether the marginal effect of decentralization depends on institutional conditions. For interpretation, we report on marginal effects:

$$\frac{\partial IG_{it}}{\partial Dec_{it}} = \beta + \delta \, Inst_{it} \quad (6)$$

[18] Political stability (PV) reflects the perceived likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. Control of corruption (CC) assesses the extent to which public power is exercised for private gain, encompassing both petty and grand forms of corruption, as well as the influence of elites and private interests on state decision-making.

5.5 Nonlinearity: Inverted U-shape

Lastly, to test whether decentralization exhibits a nonlinear relationship with IG, we estimate:

$$IG_{it} = \beta_1 \, Dec_{it} + \beta_2 \, Dec_{it}^2 + \mathrm{X}_{it}'\gamma + \alpha_i + \lambda_t + \varepsilon_{it} \quad (7)$$

An inverted U relationship corresponds to $\beta_1 > 0$ and $\beta_2 < 0$ and indicates that inclusiveness increases with subnational autonomy up to a threshold, beyond which coordination failures, duplication, or local capture begin to dominate. The implied turning point (in the units of Dec) is:

$$Dec^{\star} = -\frac{\beta_1}{2\beta_2} \quad (8)$$

6 Results

6.1 Two-way Fixed Effects and IV

Table 3 shows the baseline TWFE estimates alongside the fixed-effects IV results, which provide strong support for Hypothesis 1: greater subnational autonomy leads to higher IG. The TWFE estimates indicate a positive and statistically significant relationship between subnational autonomy (RAI) and inclusive growth (IGI). The IV estimate shows a larger effect and implies that increases in subnational authority have economically meaningful effects on IG.[19] Specifically, the IV coefficient indicates that a one-unit increase in the RAI raises the IGI by 0.0069. When evaluated at the sample distribution of decentralization, a one–standard deviation increase in subnational authority is associated with an increase of approximately 0.07 in the IGI. Relative to the sample mean of the IGI, this corresponds to an improvement of about 13 percent, or roughly 0.45 standard deviations of IG, indicating that the estimated effect is non-trivial in magnitude.[20] At the same time, this effect should be interpreted as reflecting the importance of a substantial decentralization reform rather than a marginal policy change.

Table 3. Two-way Fixed Effects and IV (GFI)

	(1) TWFE Inclusive Growth Index	(2) IV (GFI) Inclusive Growth Index

[19] The larger IV magnitude suggests that the bias in within-country fixed-effects estimates, arising from policy endogeneity or attenuation from measurement error in decentralization, may lead TWFE to understate the causal impact.

[20] A one–standard deviation increase in decentralization corresponds to an increase of 9.928 points in the RAI. Multiplying this by the IV coefficient (0.0069) yields a predicted increase of 0.0685 in the IGI. Given a sample mean of 0.528 and a standard deviation of 0.155 for the IGI, this effect represents approximately 13 percent of the mean and 0.45 standard deviations of the outcome variable.

Regional Authority Index	0.0010***	0.0069**
	(0.0003)	(0.0032)
Population (logged)	-0.0020**	-0.0021***
	(0.0007)	(0.0003)
Gross Capital Formation (WB)	0.0015***	0.0015***
	(0.0005)	(0.0002)
Inflation	0.0000**	0.0000
	(0.0000)	(0.0000)
Trade Openness	-0.0002**	-0.0002***
	(0.0001)	(0.0001)
Credit to GDP Ratio	-0.0000	0.0001
	(0.0001)	(0.0001)
Constant	0.4749***	0.4104***
	(0.0037)	(0.0351)
Country and Year FE	Yes	Yes
N	1219	1219
N countries	69	69
R2-within	0.684	0.604

Robust standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
RAI is instrumented using the Geographic Fragmentation Index (GFI).

The estimated coefficients for the control variables are largely consistent with theoretical expectations and the results found in prior empirical studies. Gross capital formation shows a significantly positive effect on IG; specifically, a 1 percentage point increase in investment as a share of GDP is associated with a 0.0015 unit increase in the IGI. Inflation presents a coefficient of negligible magnitude, possibly because the opposing forces of the "inflation tax" on the poor and the stimulus effects of moderate inflation negate each other in the aggregate. Conversely, population (logged) is negatively associated with IG, potentially reflecting the challenges of maintaining equitable service delivery in larger jurisdictions. Trade openness is negative and significant, albeit small in magnitude. Finally, domestic credit to the private sector is not statistically significant. This likely indicates that aggregate financial *depth* (the size of the sector) does not automatically translate into financial *inclusion* or broad-based access to credit for low-income households and SMEs.[21]

[21] This non-significant result is consistent with the finance-inequality nexus literature, which suggests that financial deepening does not automatically lead to inclusive growth. Credit expansion in developing economies often results in concentration of funds among large firms and wealthy borrowers, while leaving low-income households credit-constrained (Claessens and Perotti, 2007). In addition, when credit flows primarily to real estate or financial asset

6.2 Additional Control: Institutional Quality

Table 4 reports the results of the augmented version of Equation 1, which incorporates institutional quality. This specification tests whether the relationship between decentralization and IG is robust to the inclusion of institutional quality measures and whether institutional quality itself has an independent effect on IG. Across both specifications, the positive effects of decentralization remain highly robust: the RAI coefficient stays positive and significant when controlling for political stability (0.0011, $p < 0.01$) or corruption (0.0010, $p < 0.01$). These results indicate that the decentralization effect is not simply proxying for broader governance improvements.

Table 4. Additional Control: Institutional Quality**

	Proxy for Institutional Quality	
	Political Stability	**Corruption**[22]
Regional Authority Index	0.0011***	0.0010***
	(0.0002)	(0.0003)
Political stability	0.0109***	
	(0.0031)	
Control of Corruption		0.0112***
		(0.0025)
Constant	0.4672***	0.4690***
	(0.0044)	(0.0046)
Control variables	Yes	Yes
Year and Country FE	Yes	Yes
N	1078	1078
N countries	68	68
R2-within	0.690	0.686

Robust Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

**All specifications include the full set of control variables (log population, capital formation, inflation, trade openness, and domestic credit) as well as country and year fixed effects. To conserve space, these control coefficients are omitted here. These estimates remain consistent with the baseline results presented in Table 3 and are available from the authors upon request.

Additionally, institutional quality measures themselves are positively associated with IG. Higher political stability and lower corruption each lead to higher IG. Taken together, these estimates indicate that subnational autonomy is positively related to IG even after controlling for institutional quality, and institutional quality measures independently contribute to IG, which motivates an

markets rather than productive sectors, it may exacerbate inequality without generating broad-based employment (Bezemer et al., 2016).

[22] Each question or variable used in the aggregate data is rescaled to range from 0 to 1, with higher values corresponding to better governance outcomes.

explicit examination of whether institutional quality conditions the effectiveness of decentralization, as we explore in the next section.

6.3 Moderating Effect: Institutional Quality

Table 5 shows the results from the estimation of Equation 5, testing Hypothesis 2: whether institutional quality moderates the effect of decentralization on IG by including interaction terms between RAI and each institutional measure. The interaction coefficients are positive and statistically significant for both corruption and political stability. These estimates indicate that the marginal effect of decentralization on IG increases with institutional quality. Using the sample mean of the corruption control measure (0.44), the implied marginal effect of RAI is 0.00131.[23] At one standard deviation above the mean (approximately 1.53), the marginal effect rises to about 0.00207, whereas at one standard deviation below the mean (approximately minus 0.65), it falls to about 0.00054.

The political stability interaction yields a similar pattern. At low levels of political stability, the implied decentralization effect becomes very small; at high levels of political stability, the slope increases materially, indicating that reforms toward greater subnational autonomy translate more directly into inclusive outcomes when political conditions support policy continuity, implementation capacity, and accountability. These effects are illustrated in Graphs 1 and 2.[24]

Table 5. Interaction with Institutional Quality**

	Proxy for Institutional Quality	
	Control of Corruption	**Political Stability**
Regional Authority Index	0.0010***	0.0015***
	(0.0002)	(0.0003)
Institutional Quality	0.0024	0.0044
	(0.0057)	(0.0047)
Regional Authority Index # Institutional Quality	0.0007**	0.0005**
	(0.0003)	(0.0002)
Constant	0.4671***	0.4637***
	(0.0045)	(0.0047)

[23] $0.0010 + 0.0007 \times 0.44 \approx 0.00131$

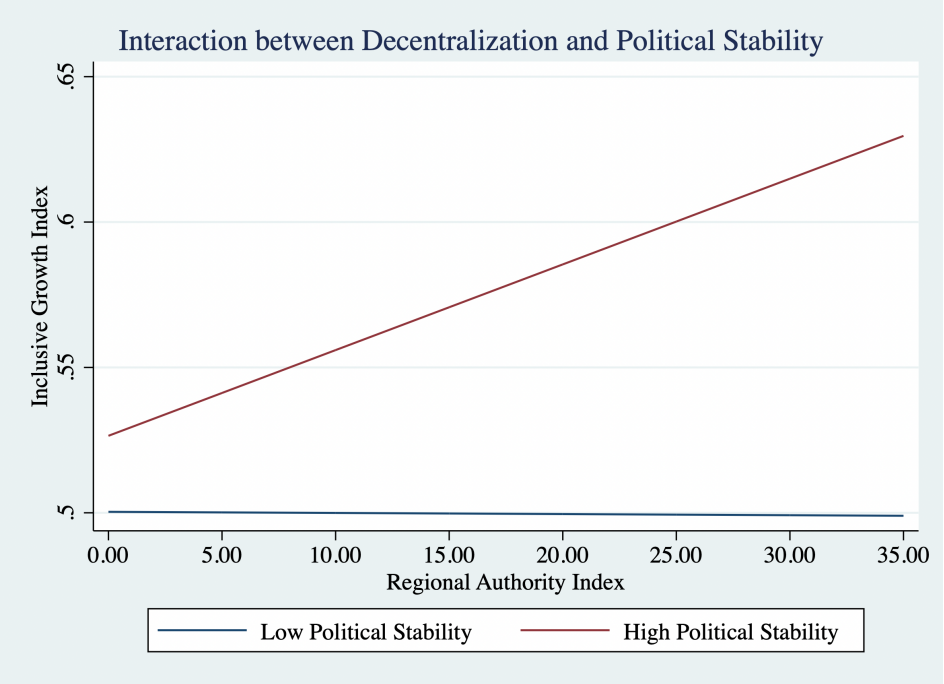
[24] This aligns with findings in developing contexts, such as Sepulveda and Martinez-Vazquez (2011), Moche et al. (2014), and Shahzad and Yasmin (2016), who observe that without adequate capacity, subnational governments may fail to implement pro-poor policies effectively or may redirect transfers away from poverty alleviation.

Control variables	Yes	Yes
Year and Country FE	Yes	Yes
N	1078	1078
N countries	68	68
R2-within	0.688	0.692

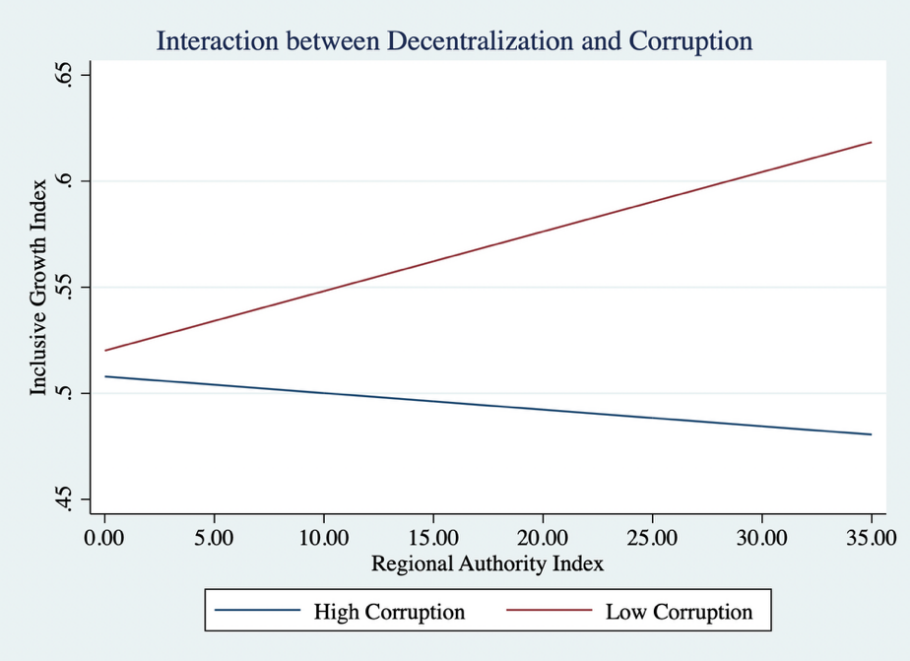
Robust Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

**All specifications include the full set of control variables (log population, capital formation, inflation, trade openness, and domestic credit) as well as country and year fixed effects. To conserve space, these control coefficients are omitted here. These estimates remain consistent with the baseline results presented in Table 3 and are available from the authors upon request.

Graph 1. Interaction between Decentralization and Political Stability



Graph 2. Interaction between Decentralization and Corruption



Note: the graphs depict that IG increases steeply with decentralization in high institutional quality environments, while remaining relatively flat in low quality settings, showing that decentralization enhances IG when supported by stable political conditions and effective governance.

6.4 Nonlinear Relationship between Decentralization and Inclusive Growth

The nonlinear specification tests Hypothesis 3: whether the effect of decentralization varies over its range. As seen in Table 6, the estimated linear term is positive and highly significant, while the quadratic term is negative and highly significant, providing evidence of an inverted U-shaped relationship between decentralization and IG (depicted in Graph 3). To verify that this non-linearity occurs within the observed range of our data, we calculate the inflection point:

$$RAI^{\star} = -\frac{\beta_1}{2\beta_2} \approx -\frac{0.0028}{2 \times (-0.0001)} \approx 14.$$

Table 6. Non-linear: Inverted U-shaped Relationship**

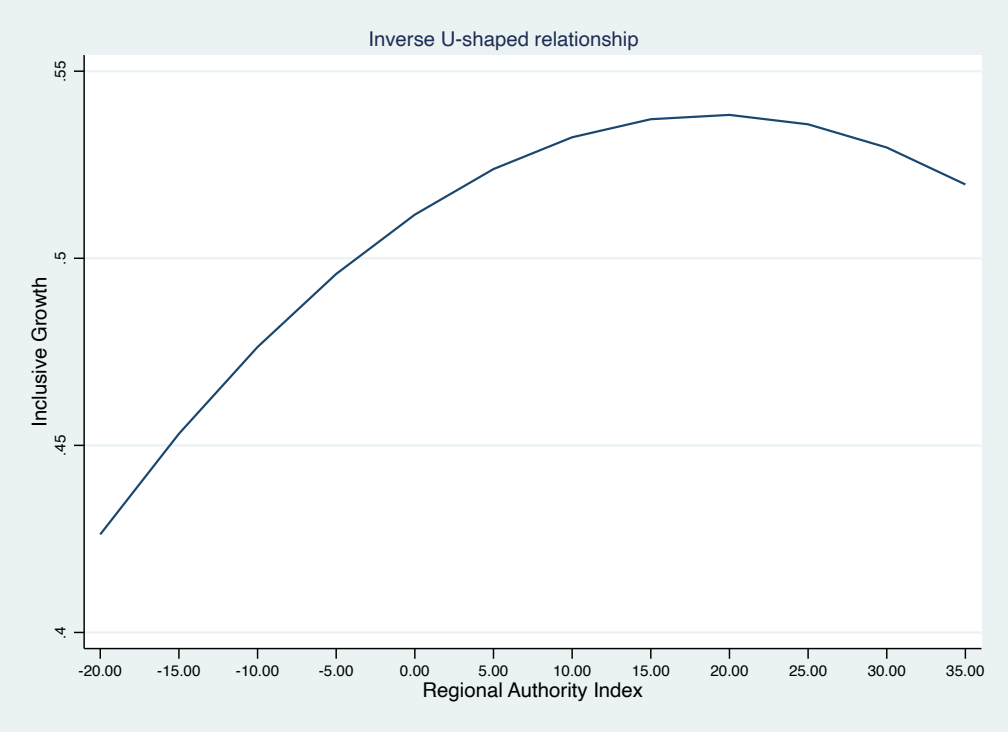
	Inclusive Growth Index
Regional Authority Index	0.0028***
	(0.0008)
Regional Authority Index # Regional Authority Index	-0.0001***
	(0.0000)
Constant	0.4708***
	(0.0061)

Control variables	Yes
Year and Country FE	Yes
N	1219
N countries	69
R2-within	0.686

Robust Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

**All specifications include the full set of control variables (log population, capital formation, inflation, trade openness, and domestic credit) as well as country and year fixed effects. To conserve space, these control coefficients are omitted here. These estimates remain consistent with the baseline results presented in Table 3 and are available from the authors upon request.

Graph 3. Inverse U-shaped Relationship



This estimated turning point (14) falls well within the sample range (0 to 37) and is notably close to the sample mean (12.85). While this value should not be interpreted as a precise policy target given the composite nature of the RAI, the result suggests that for a typical country in our sample, the marginal benefits of decentralization regarding the impact on IG are exhausted at intermediate levels. Beyond this point, the theoretical costs of decentralization—such as coordination failures, duplication of resources, and elite capture—appear to outweigh the benefits of local autonomy, again, regarding IG (Prud'homme, 1995; Tanzi, 1996; Bardhan & Mookherjee, 2000).

6.5 Lagged Decentralization and Delayed Effects

Finally, the lagged specifications (Equation 4) examine whether the effect of decentralization is also realized with delays and whether lagging our decentralization variable partially helps to address concerns about the weakness of contemporaneous feedback. Table 7 reports results using one-, three-, and five-year lags of the RAI. The results show that estimated coefficients remain positive and statistically significant across all lags. The gradual decline in the magnitude of the estimated coefficients is consistent with partial dissipation over longer horizons, while the persistence of statistical significance suggests that decentralization is not merely capturing short-run contemporaneous co-movement. This is consistent with the view that institutional and policy channels (e.g., reallocations toward local public goods, improvements in service delivery, and human-capital accumulation) may take time to materialize into meaningful outcomes.

Table 7. Lagged RAI of 1, 3, and 5 Years**

	1-Year Lag	3-Year Lag	5-Year Lag
L1. RAI	0.0008**		
	(0.0003)		
L3. RAI		0.0007*	
		(0.0004)	
L5. RAI			0.0006**
			(0.0002)
Constant	0.0000	0.4783***	0.5727***
	(.)	(0.0048)	(0.0026)
Control variables	Yes	Yes	Yes
Year and Country FE	Yes	Yes	Yes
N	1186	1118	1048
N countries	69	69	69
R2-within	0.680	0.685	0.687

Robust Standard errors in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

**All specifications include the full set of control variables (log population, capital formation, inflation, trade openness, and domestic credit) as well as country and year fixed effects. To conserve space, these control coefficients are omitted here. These estimates remain consistent with the baseline results presented in Table 3 and are available from the authors upon request.

7 Additional Robustness Checks

In this section, we evaluate whether our findings of subnational autonomy's effect on IG are robust to alternative estimators designed to address endogeneity and dynamic persistence as well as to alternative operationalizations of both the dependent variable (IG) and the measure of decentralization.

7.1 Dynamic Panel Estimation: System GMM

First, we further assess the robustness of the decentralization–IG relationship using the system GMM estimator (Arellano & Bover, 1995; Blundell & Bond, 1998). System GMM is widely employed in macro and political economy panels to address potential endogeneity arising from simultaneity, reverse causality, and unobserved heterogeneity, particularly when variables exhibit high persistence (Blundell & Bond, 1998). The estimator exploits internal instruments constructed from lagged levels and lagged differences of the endogenous variables and estimates a system of equations in first differences and in levels under standard moment conditions (Arellano & Bond, 1991; Roodman, 2009).

Table 8. System GMM

	Inclusive Growth Index
Regional Authority Index	0.0348***
	(0.0057)
Population (logged)	-0.0081***
	(0.0022)
Gross Capital Formation (WB)	0.0026*
	(0.0014)
Inflation	0.0001***
	(0.0000)
Trade Openness	0.0005*
	(0.0003)
Credit to GDP Ratio	0.0005*
	(0.0003)
Constant	0.0000
	(0.0001)
Year and Country FE	Yes
N	1219
N countries	69
Instruments	29
Hansen *J*-test	0.104
Difference in Hansen test	0.891
AR(1) test	0.200
AR(2) test	0.146

* p < 0.10, ** p < 0.05, *** p < 0.01. Windmeijer (2005) finite sample corrected standard errors are in parentheses. P-values are reported in brackets. To limit instrument proliferation, the instrument matrix is collapsed and only second-lags are used as instruments. The Hansen J-test reports p-values for the null that instruments are valid. AR(1) and AR(2) reports p-values for first and second order autocorrelated disturbances.

Table 8 reports the system results, where subnational autonomy (RAI) is treated as endogenous and instrumented using its second lag. Standard diagnostic tests support the validity of the

specification. The Arellano–Bond test fails to reject the null of no second-order serial correlation, and the Hansen test of overidentifying restrictions does not reject instrument validity. Additionally, difference-in-Hansen tests confirm the exogeneity of the instrument subsets. The coefficient on RAI remains positive and statistically significant, which provides further support for a positive association between decentralization and IG. Given the highly sensitive nature of system GMM estimates to instrument choice and finite-sample properties, we emphasize the consistency in sign and statistical significance rather than the precise magnitude. But overall, these results strongly suggest that the positive decentralization effect on IG is robust to an alternative identification strategy based on internal instruments.

7.2 Heteroskedasticity-based Identification: Lewbel IV

We next implement Lewbel's (2012) heteroskedasticity-based instrumental variables approach. This method is particularly useful when external instruments are limited or potentially weak. Identification is achieved by exploiting heteroskedasticity in the first-stage error term to construct internal instruments as products of demeaned exogenous variables and estimated residuals. Under standard assumptions, these generated instruments are correlated with the endogenous regressor but orthogonal to the structural error term (Lewbel, 2012; Baum & Lewbel, 2019).

Table 9. Lewbel IV

	(1) Inclusive Growth Index (Standard IV)	**(2) Inclusive Growth Index (Generated Instruments)**	**(3) Inclusive Growth Index (Generated Instruments + External Instruments)**
Regional Authority Index	0.001**	0.001	0.001***
	(0.0005)	(0.0007)	(0.0004)
Population (logged)	-0.0023***	-0.0026***	-0.0026***
	(0.0004)	(0.0004)	(0.0004)
Gross Capital Formation (WB)	0.0018***	0.0019***	0.0019***
	(0.0002)	(0.0002)	(0.0002)
Inflation	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)
Trade Openness	-0.0002**	-0.0002***	-0.002***
	(0.0001)	(0.0001)	(0.0001)
Credit to GDP Ratio	-0.0000	-0.0000	-0.0000
	(0.0000)	(0.0000)	(0.0000)
Year and Country FE	Yes	Yes	Yes

N	1186	1186	1186

Robust Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9 shows three specifications: (1) a standard IV benchmark, (2) a model using generated Lewbel instruments, and (3) a model combining generated instruments with external instruments. Across all specifications, the estimated coefficient of RAI remains positive and statistically significant, except for that of generated-instruments-only, which is positive but insignificant. Importantly, the magnitude of the RAI coefficient under the Lewbel IV approach is close to the two-way fixed effects estimate, indicating that the positive decentralization effect is not driven by a particular external instrument strategy. The stability of the coefficients on the main controls across Lewbel specifications further suggests that the decentralization effect is not an artifact of changes in covariate estimates.

7.3 Alternative Proxies for Inclusive Growth

We next assess whether the decentralization effect is robust to alternative dependent variables that capture different aspects of IG outcomes. Two alternatives are considered: (i) a composite IGI based on the Ramos et al. (2013) approach and (ii) logged GDP per person employed. Using the Ramos-style index, the coefficient on RAI remains positive and highly statistically significant (Table 10). Similarly, when logged GDP per person employed is used as the dependent variable, RAI also shows a positive and significant effect. Although the magnitudes are not directly comparable across these dependent variables due to differences in scaling and construction, the consistent sign and statistical significance of the decentralization coefficient indicate that the core results are not an artifact of the particular IGI construction.

Table 10. Alternative Proxies for Inclusive Growth**

	Inclusive Growth Index (Ramos et al. 2013)	**GDP per person employed (logged)**
Regional Authority	0.0027***	0.0073**
Index	(0.0006)	(0.0029)
Constant	0.6336***	10.5789***
	(0.0057)	(0.0357)
Control variables	Yes	Yes
Year and Country FE	Yes	Yes
N	932	1219
N countries	67	69
R2-within	0.468	0.583

Robust Standard errors in parentheses;* p < 0.10, ** p < 0.05, *** p < 0.01

**All specifications include the full set of control variables (log population, capital formation, inflation, trade openness, and domestic credit) as well as country and year fixed effects. To conserve space, these control coefficients are omitted here. These estimates remain consistent with the baseline results presented in Table 3 and are available from the authors upon request.

7.4 Alternative Proxies for Fiscal Decentralization

Finally, we replace the primary RAI decentralization variable with conventional fiscal decentralization measures from the IMF's Government Finance Statistics (GFS), distinguishing expenditure decentralization and revenue decentralization. When decentralization is measured by expenditure decentralization, the coefficient is positive and statistically significant (Table 11). This specification is estimated on a smaller sample due to data availability but nonetheless yields results consistent with the main findings. By contrast, when revenue decentralization is used, the coefficient remains positive but is not significant. This difference likely reflects the "dark side" of revenue autonomy: while expenditure decentralization allows for targeted social investments, higher levels of revenue decentralization have consistently been linked to worsening income distribution (Goerl & Seiferling, 2014; Sacchi & Salotti, 2014). Because revenue autonomy tends to favor wealthier jurisdictions with broader tax bases, it can exacerbate regional inequalities that offset the growth benefits, rendering the net effect on IG insignificant. Moreover, measured revenue decentralization often captures shared or centrally constrained revenues that do not correspond to genuine subnational discretion. Ultimately, IG is likely to be more directly influenced by subnational expenditure choices, such as investments in education, job training, and health, than by the localization of revenue collection per se.

Table 11. Alternative Proxies for Fiscal Decentralization**

	Inclusive Growth Index	**Inclusive Growth Index**
Expenditure Dec. (IMF)	0.1030***	
	(0.0355)	
Revenue Dec. (IMF)		0.0086
		(0.0480)
Constant	0.4866***	0.5018***
	(0.0157)	(0.0131)
Control variables	Yes	Yes
Year and Country FE	Yes	Yes
N	597	674
N countries	49	53
R2-within	0.733	0.711

Robust Standard errors in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

**All specifications include the full set of control variables (log population, capital formation, inflation, trade openness, and domestic credit) as well as country and year fixed effects. To conserve space, these control coefficients are omitted here. These estimates remain consistent with the baseline results presented in Table 3 and are available from the authors upon request.

8 Conclusion

This paper examines whether, and under what conditions, greater subnational autonomy improves inclusive growth. Using a panel of 69 countries over 1996–2017, we measure decentralization with the Regional Authority Index and capture IG with a composite index that incorporates both income and non-income dimensions.

Across the core specifications, the evidence consistently indicates that expanding subnational autonomy leads to higher IG. The baseline two-way fixed effects (TWFE) and the fixed-effects IV estimates show consistent results, with the IV coefficient implying an economically significant effect relative to the index mean.

A second key finding is that these decentralization gains are conditional on institutional quality. In the interaction models, the RAI main effect remains positive and highly significant, and the interaction between RAI and institutional quality (proxied by political stability and control of corruption) is positive and statistically significant. This pattern implies that the marginal effect of greater subnational autonomy is stronger where governance conditions better support accountability, constrain potential elite capture, and facilitate effective policy implementation. Substantively, the results align with the broader view that decentralization is most effective when local discretion is matched by institutional environments that enable transparency, monitoring, and credible enforcement.

Third, the relationship between decentralization and IG is not monotonic. The nonlinear specification indicates an inverted-U pattern, implying increasing IG gains at lower to moderate levels of decentralization that taper, and eventually decline, beyond a threshold. This result is consistent with the idea that while decentralization improves policy fit and accountability, very high levels can introduce coordination failures, duplication of functions, and interjurisdictional spillovers that weaken inclusive performance.

Fourth, the dynamic specifications show that the effects of decentralization can materialize with delay. The coefficients on one-, three-, and five-year lagged RAI are positive and significant, supporting the interpretation that decentralization influences IG through channels that operate over

multi-year horizons (e.g., institutional learning, changes in service delivery, and structural labor-market adjustments).

Finally, an extensive set of robustness checks strengthens confidence in the main conclusions. The system GMM estimates preserve a positive and statistically significant decentralization effect in a dynamic framework. Lewbel heteroskedasticity-based IV estimates likewise support the core finding. Additionally, the results are robust to alternative measures of IG (Ramos-style index and logged GDP per person employed), and to alternative decentralization proxies: expenditure decentralization and revenue decentralization.

Our results lead to several policy implications. First, the main result highlights the importance of genuine subnational autonomy for IG. By employing the RAI rather than conventional metrics based solely on expenditure or revenue shares, the analysis captures the extent to which subnational governments possess meaningful decision-making authority. The stronger and more consistent effects obtained using this institutional measure indicate that IG responds not merely to the allocation of fiscal resources, but also to the degree of actual autonomy over policy design and implementation. For policymakers, this suggests that reforms must go beyond "funding the regions" to granting them explicitly the political and institutional discretion to tailor programs to local needs.

Second, the results indicate that decentralization reforms are most effective when paired with governance upgrades. In settings with weaker institutions, expanding subnational autonomy without adequate safeguards may yield smaller gains and increase the risks of misallocation or capture. In such contexts, a "gradualist" approach to devolution, where additional autonomy is conditional on meeting benchmarks in administrative capacity and transparency, represents a more defensible and effective reform strategy.

Third, the inverted U-shaped relationship suggests that more decentralization is not necessarily a panacea, since our results indicate that marginal gains for IG taper after certain level of decentralization. This finding highlights the importance of institutional arrangements that facilitate coordination across levels of government. Rather than pursuing open-ended devolution, reforms in highly decentralized contexts should prioritize institutional coherence to prevent fragmentation. This requires robust intergovernmental frameworks that ensure local autonomy does not come at the expense of national redistributive capacity or cross-regional equity.

Two limitations of the current research in this paper also suggest some potential productive future extensions. First, while the IV and complementary identification strategies substantially strengthen causal interpretation, decentralization reforms may still be accompanied by contemporaneous political or administrative changes that are difficult to observe fully. Future work could exploit reform "events" more directly (e.g., constitutional decentralization episodes) and evaluate heterogeneous effects across income groups, regime types, and levels of regional inequality. Second, the inverted-U relationship suggests that different mechanisms may operate at low versus high levels of decentralization. While decentralization may initially improve policy fit and accountability, higher levels of autonomy may introduce coordination challenges, weaken national redistributive capacity, or increase the risk of local capture. Distinguishing among these channels would require richer data on sectoral spending patterns, intergovernmental transfer systems, and subnational administrative capacity. Future work that combines cross-country analysis with more detailed subnational evidence would help identify which institutional features and policy domains most effectively translate decentralization into IG.

9 Appendix: Construction of Inclusive Growth Indices (IGI)

9.1 Construction of Main IGI using PCA

The construction of the IGI follows a multi-step PCA procedure. All underlying variables are first standardized to have zero mean and unit variance to ensure comparability across indicators measured in different units. Following UNCTAD's methodology, we conducted separate PCA for each component and applied varimax rotation to maximize interpretability by ensuring that each factor loads strongly onto one variable (rather than being spread across multiple variables) (UNCTAD & EEC, 2019). The resulting factor loadings were used to construct a normalized index for each component.

The final IGI is calculated as the arithmetic mean of the income and non-income subindices. The use of the arithmetic mean, rather than a geometric mean, is motivated by both conceptual and empirical considerations. Conceptually, the arithmetic aggregation allows for partial substitutability across dimensions, which aligns with frameworks that view IG as the joint evolution of economic expansion and equity rather than as a setting of strict complementarity among components. This interpretation is also consistent with Anand et al. (2013), who emphasize that IG reflects distribution-sensitive growth outcomes rather than uniform progress across all dimensions. Empirically, the arithmetic mean avoids excessive penalization of countries exhibiting uneven progress across income and non-income dimensions, an important consideration in panel settings characterized by substantial within-country variation over time.

9.2 Construction of Alternative IGI – Ramos et al. (2013) Style

Building on the Ramos et al. (2013) idea of an IGI, we construct an index that captures two key dimensions:

i. Benefit-Sharing: This dimension assesses whether economic growth has effectively reduced poverty and income inequality.
   - Poverty is measured by the headcount ratio at $2.15/day (2017 PPP), sourced from the World Development Indicators (World Bank).
   - Inequality is captured by the Gini coefficient, obtained from the Standardized World Income Inequality Database (SWIID).

ii. Participation: This dimension reflects the extent of societal engagement in the growth process. It is measured by the Employment-to-Population Ratio (EPR), which indicates the

share of working-age individuals actively participating in the economy (ILO estimates). To align the interpretation of all variables, where lower values represent better inclusivity, we take the inverse of EPR.

Methodology:

i. Three-Year Averaging for Missing Data: Following Ramos et al. (2013), we address missing values by calculating the arithmetic mean across a three-year window (Y-1, Y, Y+1). If data for Y is missing, we use the average of Y-1 and Y+1. If both are missing, we use Y-1. This approach reduces data gaps while preserving temporal trends.

ii. Min-Max Normalization: Each variable (inverse EPR, poverty headcount, inequality) is normalized to a 0–1 scale, where lower values indicate better performance (greater inclusivity).

iii. Index Construction: The final IGI is computed as the simple average of the three normalized indicators. Conceptually, this index reflects each country's proximity to the best outcomes in poverty, inequality, and employment across the sample.

We follow Ramos et al. (2013) in constructing the index and use data from 1996 onward, extending the time series to 2019 to capture more recent trends. The final index is on a 0-1 scale where "0" indicates high inclusivity and "1" indicates low inclusivity. For our research, however, we inverse this index so that low value indicates low inclusivity and high value indicates high inclusivity.

10 References

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