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Federalism, ICT and Development in the Global South

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ABSTRACT

This paper builds on the ICT and development literature to answer the question on what indicators better represent ICT institutional background in the Global South, namely Central America, the Caribbean Islands, South America, Africa and South Asia. It delves into the institutional variable of federalism widely used in comparative analyzes tackling the correlation between *e.g.* broadband deployment and economic development, by finding granulated variables that portray a more precise scenario of institutional commensurability among countries being compared for public policy purposes. Its main underpinnings are the concept of information revolution and the methodology put forward by the Telecommunications Law Indicators for Comparative Studies (TLICS) Model. Six sets of federative indicators on revenue, fiscal transfer, regulatory jurisdiction, adjudication, planning, and media content regulation are put together to compare ICT federal environment in the Global South as a groundwork for the ICT

comparative research. The empirical universe of the paper encompassed thirty-eight countries from Central and South America, the Caribbean Islands, Africa and South Asia, that form a potpourri of thirty officially unitary countries – Angola, Belize, Bolivia, Cabo Verde, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guinea Bissau, Haiti, Honduras, Jamaica, Mozambique, New Zealand, Nicaragua, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad and Tobago, and Uruguay –, and eight federal countries – Argentina, Brazil, India, Malaysia, Mexico, Nigeria, South Africa, and Venezuela. The article is organized in three main parts. A brief description of the paper assumptions is performed in the first part. The second part applies TLICS variables to sets of the aforementioned states. The third part delves into the comparison of the states analyzed by means of categorizing the differences and commonalities revealed by more than one thousand five hundred variables collected in the legal and institutional framework of those countries and finally summarized in the ICT federal index (IFI) and ICT unitary index (IUI). We also test the association between federalism as the outcome and each of the independent (explanatory) variables proposed by the TLICS model by applying statistical tests (Fisher exact test, relative risk, and odds ratio). The only ICT variable significantly associated with a country being classified as a federal state is tax in the telecom and broadcast. As a main outcome, based on data collected from the institutional background and legal frameworks of those countries, we found clusters of federal commonalities in federal and unitary countries of the region. With that, we proposed two indices that better represent federal and unitary institutional backgrounds: The ICT Federal Index (IFI); and the ICT Unitary Index (IUI). They provide a real picture of their institutional background for ICT and development comparative purposes and gather sets of countries with similar institutional backgrounds upon which the ICT and Development literature may rely on to explain different outcomes from public policies or investments on ICT in countries that share a common institutional background, as far as the institutional variable of federalism is concerned.

Keywords

TLICS Model, institutional variable, ICT & Development, federalism, Global South.

THE OBSOLETE ASSERTION OF THE OBSOLESCENCE OF FEDERALISM

What level of government, either centralized or decentralized, is best suited to regulating has been a disputed question among economists to the point that when Hahn, Layne-Farrar, & Passell (2004, p. 46) analyzed the U.S. wireless communications case, they concluded that the question of the optimal degree of decentralization of regulation is a *never-ending debate*. They also noted that attempts of generalization should be avoided as they distract us from serious analysis, although they conceded in placing the burden of proving that the regulation merits on the proponents of decentralization, due to the detrimental effects of balkanization in industries with growing scale, scope, network efficiencies and rapid technological change (Hahn, Layne-Farrar, & Passell, 2004, p. 50). The literature on federalism also points out to the growing importance of division of power on geographic basis as a response to the paradigm shift from world of sovereign nation-states to a world of culturally diverse democracies and “increased interstate linkages of a constitutionally federal character” (Watts, 1999, p. 4).

This paper neither tackles the contemporary debate on the usage of the theories of federalism to deal with citizenship in culturally diverse democracies nor discusses the ongoing debate on what level of government should be in charge of regulating a specific industry, due to the allegation that federal-like arrangements would be more suitable to reflect diverse values and to serve as laboratories for innovation in regulation.

Those topics on the merits of decentralized regulation and uses of federalism, nevertheless, leads us to a twofold jump-start: (i) the subject of federalism and regulation is still alive and well; and (ii) any attempt to analyze the effects of regulation in the ICT sector should avoid misconceiving generalizations, especially those advanced by propositions that simplify the multifaceted phenomenon of federal experiences worldwide, by putting together countries with similar backgrounds based, among other things, on the fact that they share a constitutional method of dividing power on geographic basis, either be it a federal or unitary one.

This paper addresses precisely the underpinnings of the literature on ICT and Development, by focusing on the federal ICT components of government regulations to devise a roadmap to economic analyses that portray a more realistic scenario of the countries’ institutional backgrounds for comparative purposes. For example, if one researches the effects of universal funds on development, the structural and institutional variables usually used to put together countries with similar backgrounds come from the legal arena, such as the countries’ legal tradition, rule of law, democracy, separation of powers, property rights, ownership restrictions, legal restrictions on the

economic activities, regulatory approach and federalism (Carlsson, 2003; Intervezes, 2005; UNESCO, 2008; ITU, 2009; Katz & Avila, 2010; ITU, 2011). By gathering the countries with similar backgrounds, economic analyses isolate those independent variables to focus on the explanatory ones, such as the effective use of the universal funds and whether they are used to foster broadband deployment, to broaden wireless coverage or to empower consumer choices.

It shows that it is not enough to put together self-declared federal or unitary countries, as they will most probably have federal or unitary-like arrangements in different aspects of the ICT regulation, presenting themselves as federal countries, *e.g.*, for tax purposes, and, at the same time, depicting a unitary system for the regulation of ICT infrastructure. In order to clarify the intricacies of federal-like arrangements in federal and unitary countries, this paper applies the TLICS model, which was designed as an analytical tool for understanding of institutional variables in order to go deep into their legal dimension and, therewith, the differences and commonalities of the institutional guarantees that constitute each legal concept cited as independent variables for the comparison of national regulatory models (Aranha, 2011).

Following previous papers on the Americas Region, we assume that federalism is itself a complex concept made of three main features: (i) National sovereignty, by which federations should be identified by the bond between national and subnational units as a constitutional-oriented one, that may rest upon a federal supremacy clause, a subset of federal clauses, or informal procedures and decisions portraying federal institutions (Simeon, 2009); (ii) Subnational autonomy, by which federations should rely on subnational governance embodied in regional institutionalized organizations that convey the message of subnational empowerment (Jovanovic, 2007; Kavalski & Zolkos, 2008) through fiscal sustainability (Ward & Dadayan, 2009), power devolution to local units (Dickovick, 2006; Fessha & Kirkby, 2008), and so forth; and (iii) Interdependent allocation of powers between national and subnational units, by which joint action is expected in federations to ameliorate federal systems as it mitigates federal dilemma between centralization and decentralization, and affirms that federal institutions may be designed to build self-enforcing federalism towards cooperation (Papillon, 2012).

Although the three features of federalism serve as a measure of federal characteristics in a given state, they are useful only when they are bound to specific manifestations of the ICT phenomenon described in Aranha *et al.* (2012). The federal institutional variable is divided in six ICT dimensions, each one divided in four categories that contemplate telecommunications, broadcast, broadband and e-commerce: (i) Revenue; (ii) Fiscal transfer; (iii) Regulation; (iv) Adjudication; (v) Planning; (vi) Media. The last assumption of this paper lies on the fact that, in order to know exactly how ICT affects development, states' institutional background would benefit should they take into account, as far as federalism is concerned, 48 variables derived from the combination of indicators – tax, administrative fees, national funds, local treasuries, regulatory jurisdiction, contingent regulation, public law adjudication, private law adjudication, national and subnational ICT development plans, and content quota – and sectors – telecom, broadcast, broadband, and e-commerce.

FEDERAL INSTITUTIONAL VARIABLES OF THE GLOBAL SOUTH

The importance of the TLICS Model approach to identify federal institutional variables in the Global South is reinforced by the fact that the ICT sector is strong in attempts of policy transfer from developed countries best practices to developing economies. Besides, ICT4D thrives as a multidisciplinary collaboration (Unwin, 2009) dependent on the inputs of definitions and comparative methods from a myriad of sources.

Regulatory reforms supported by aid agencies, such as the World Bank, UNCTAD, regional development banks, and bilateral agencies have realized that to reshape development policy means to go beyond getting the practice right. Effective development policy demands “workable institutions” that are nourished by an appropriate set of “definition[s], scope[s], comparison[s] and measurement[s]” (Minogue & Cariño, Regulatory Governance in Developing Countries, 2006, p. 62).

We applied the TLICS Model to make use of legal concepts embedded in each country's legal framework and practice to analyze how ICT regulation is actually distributed among centralized, decentralized or interdependent bodies of government in 38 countries from the Central and South America, the Caribbean Islands, Africa and South Asia, from which 30 countries are officially unitary – Angola, Belize, Bolivia, Cabo Verde, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Jamaica, Mozambique, New Zealand, Nicaragua, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad and Tobago, and Uruguay –, and 8 adopt a federal constitutional organization of power – Argentina, Brazil, India, Malaysia, Mexico, Nigeria, South Africa, and Venezuela. This empirical universe encompasses all Central and South American countries apart from

Guyana, the most representative countries of the Caribbean Islands, and South, apart from China, and a set of African countries.

Based on datasheets collected and displayed in 43 forms per country and available at the website of the University of Brasilia School of Law Center on Law and Regulation – www.getel.ndsr.org/research1.html – we summarized the collected data in 38 tables that mirror Table 1 below, in which *D* stands for subnational decentralization, *C* stands for national centralization, and *I* stands for national-subnational interdependence.

DIMENSIONS INDIA	INDICATORS (INDIA)	TELECOM	BROADCAST	BROADBAND	E-COMMERCE
Revenue	Taxing Federalism	C	C	C	C
	Administrative fees	C	C	—	—
Fiscal Transfer	Fiscal Transfer to Sectorial Funds	C	—	—	—
	Fiscal Transfer to Local Treasuries	—	—	—	—
Regulation	Regulatory Jurisdiction	C	C	C	C
	Contingent Regulation	D	D	D	D
Adjudication	Adjudication (Public Law Jurisdiction)	C	C	C	C
	Adjudication (Private Law Jurisdiction)	D	D	D	D
Planning	National ICT Development Plans	C	C	I	—
	Subnational ICT Development Plans	—	—	I	—
Media Industry	MEDIA INDUSTRY		BROADCAST	PAY TV	INTERNET
	Content Quota		C	C	—

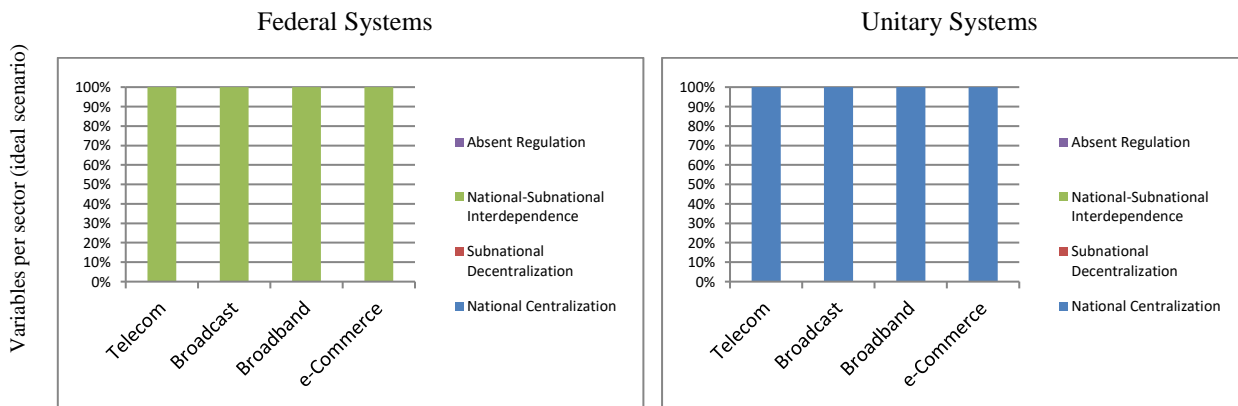
Table 1: Federal Dimensions and Indicators per Sector (INDIA)

COMPARISON OF THE ICT FEDERAL VARIABLES IN THE GLOBAL SOUTH

FEDERAL VARIABLES PER SECTOR OF TELECOM, BROADCAST, BROADBAND AND E-COMMERCE

It is common sense that when a state is categorized as unitary, it entails that a set of centralized features will be found in a variety of sectors, with subnational entities overwhelmed by national power, while federal states will portray themselves as political systems based on autonomous subnational governance. It follows that, by extrapolating the expected behavior of unitary or federal states to the ICT sector, the outcome should be depicted as shown in Figure 1 below. In other words, federal systems are expected to portray national-subnational interdependence (or some subnational decentralization) in all ICT Federal Variables per sector, while unitary systems are expected to present national centralization in all variables.

Expected Behavior of ICT Federal Variables per Sector

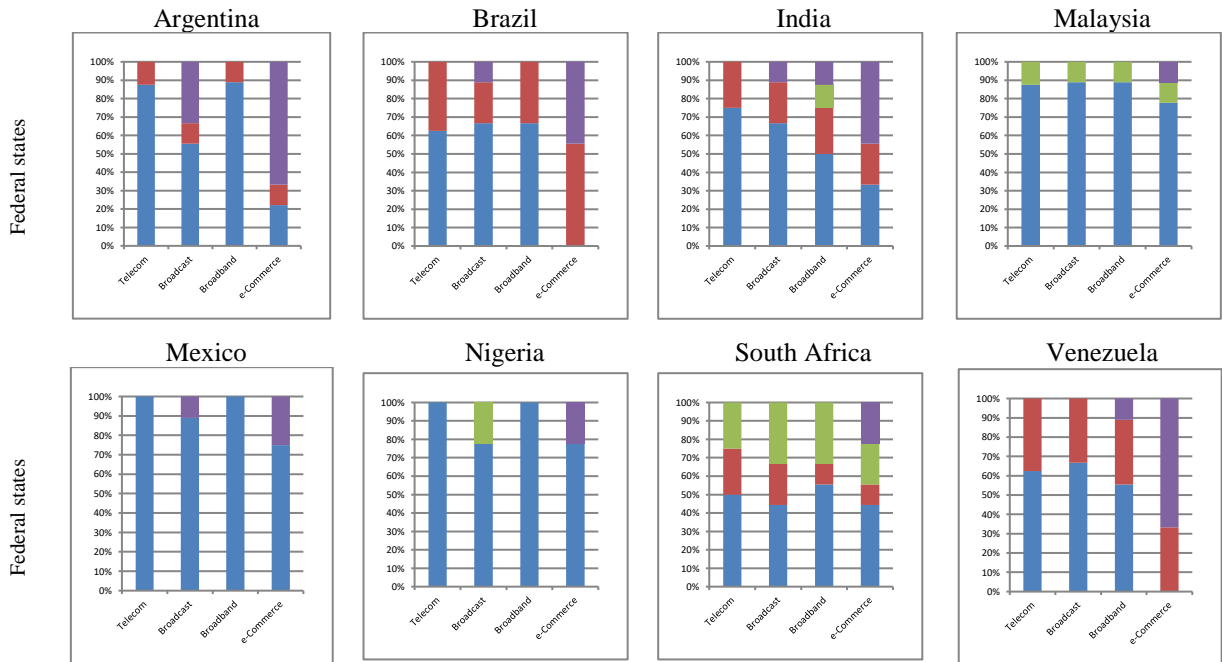


Ideal scenario of stacked bar charts depicting federal variables per sector, in which the blue color represents national centralization features, red represents subnational decentralization features, green represents national-subnational interdependence, and purple represents the absence of regulation.

Figure 1: Expected ICT federal variables per sector

Only Cuba, Guatemala, Guinea-Bissau, Mozambique, Nicaragua, Papua New Guinea, Peru, Philippines, Sao Tome and Principe, Trinidad and Tobago and Uruguay follow the expected behavior with overwhelming unitary-like arrangements. In the remaining countries, federal and unitary features can be found in ICT rules and regulation regardless the constitutional representation of the countries as federal or unitary states.

The stacked bar charts below (Figure 2) graphically show ICT federal variables – tax, administrative fees, fiscal transfers, regulatory jurisdiction, contingent regulation, public law adjudication, private law adjudication, and ICT development plans – per sector of telecommunications, broadcast, broadband, and e-commerce. The blue color represents national centralization features, while red represents subnational decentralization features, green represents national-subnational interdependence, and purple represents the absence of rules or regulation. Figure 2 shows Global South’s federal states – Argentina, Brazil, India, Malaysia, Mexico, Nigeria, South Africa, and Venezuela – and their ICT federal variables per sector – telecom, broadcast, broadband, and e-commerce.



Stacked bar charts depicting federal variables per sector, in which the blue color represents national centralization features, red represents subnational decentralization features, green represents national-subnational interdependence, and purple represents the absence of regulation. Data were analyzed using TLICS model tables available at www.getel.ndsr.org/research1.html.

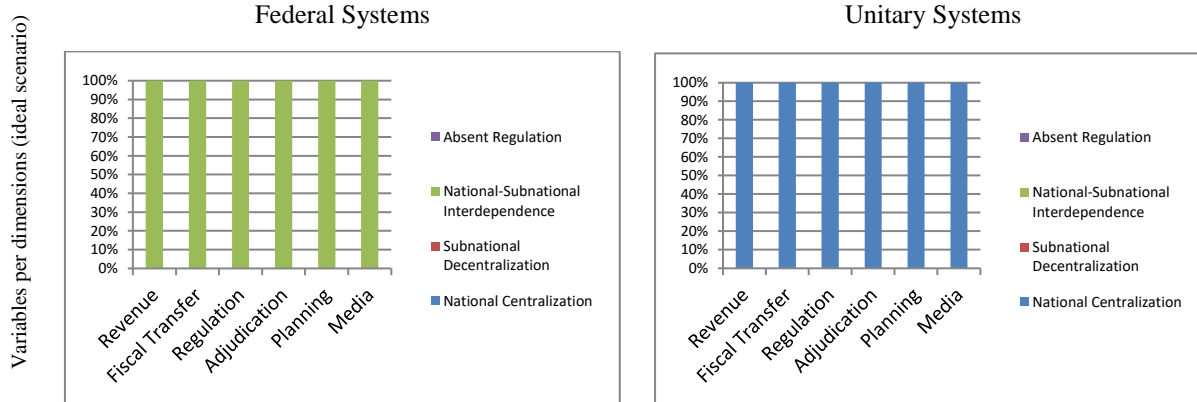
Figure 2: ICT Federal variables per sector in the Americas Region (Federations)

Due to the limitation of pages, we stop here referring the reader to the raw data available at www.getel.ndsr.org/research1.html to draw the conclusion that, under the veneer of a federation, Mexico, Nigeria and Malaysia, for example, show signs of centralized features and may be compared in its institutional background to several unitary countries of the region such as Cuba, Guatemala, Guinea-Bissau, Mozambique, Nicaragua, Papua New Guinea, Peru, Philippines, Sao Tome and Principe, Trinidad and Tobago and Uruguay.

FEDERAL VARIABLES PER DIMENSION OF REVENUE, FISCAL TRANSFER, REGULATION, ADJUDICATION, PLANNING AND MEDIA

Another ICT cleavage of the Global South’s institutional background is depicted below (Figure 3), where dimensions of federalism give a better grasp of how ICT variables should behave in an ideal scenario. Figure 3 shows that one would expect federal systems to display national-subnational interdependence in all ICT federal variables, while unitary systems would be expected to display centralized features.

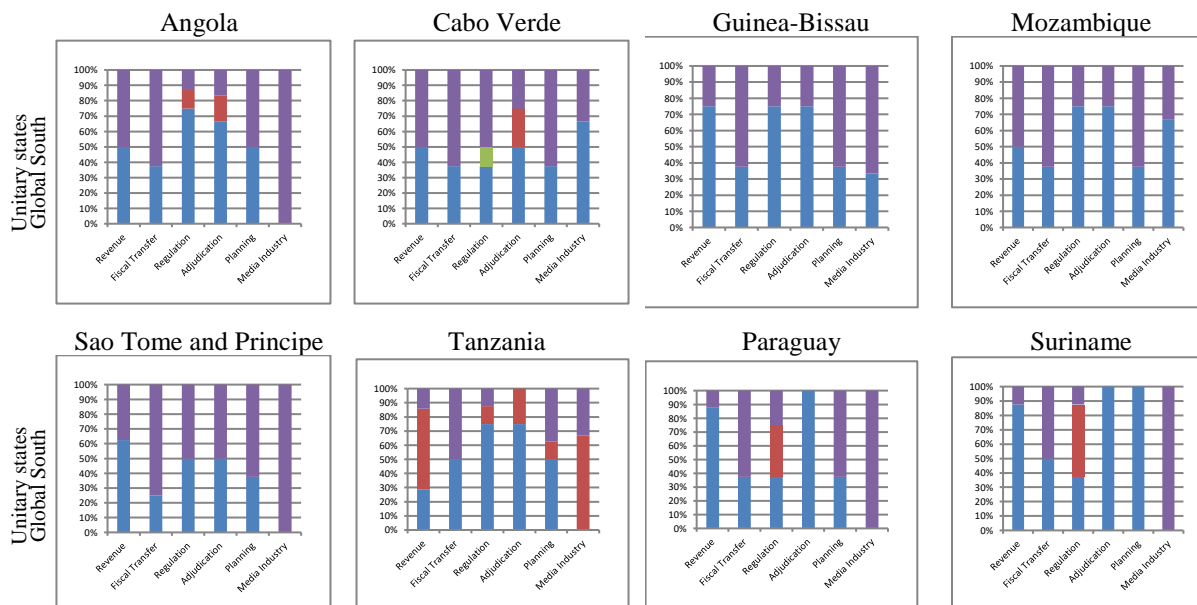
Expected Behavior of ICT Federal Variables per Dimensions

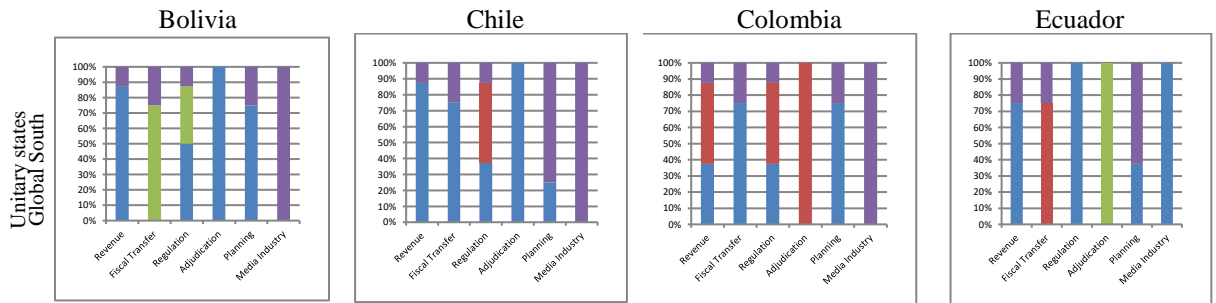


Ideal scenario of stacked bar charts depicting federal variables per dimensions, in which the blue color represents national centralization features, red represents subnational decentralization features, green represents national-subnational interdependence, and purple represents the absence of regulation.

Figure 3: Expected ICT federal variables per dimensions

The detachment of the reality from the ideal scenario is also self-evident in this cross-section of ICT variables. Figure 4 shows a set of unitary countries from the Global South behaving mostly in disarray, not least against their DNA of centralism. Unitary countries have assumed federal intentions, and federal disguised states declare themselves followers of unitary features.





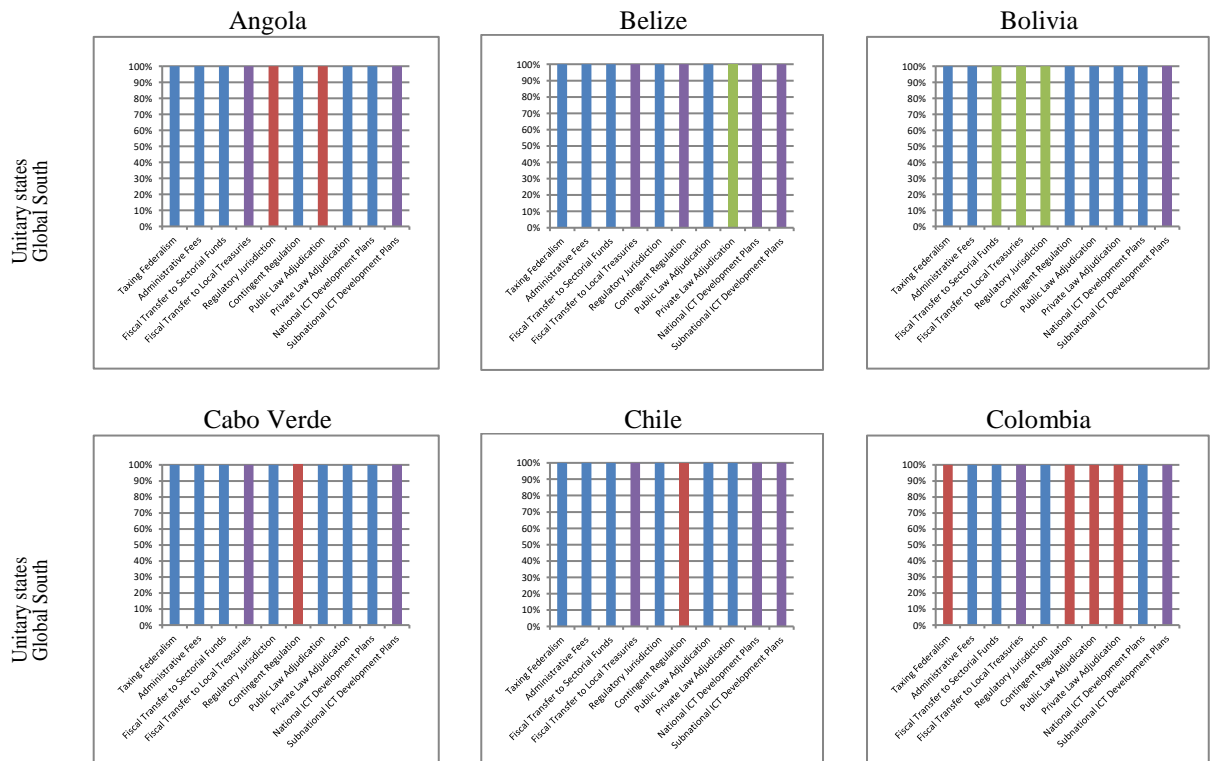
Stacked bar charts depicting ICT federal variables per dimension (revenue, fiscal transfer, regulation, adjudication, planning, and media industry), in which the blue color represents national centralization features, red represents subnational decentralization features, green represents national-subnational interdependence, and purple represents the absence of regulation. Data were analyzed using TLICS model tables available at www.getel.ndsr.org/research1.html.

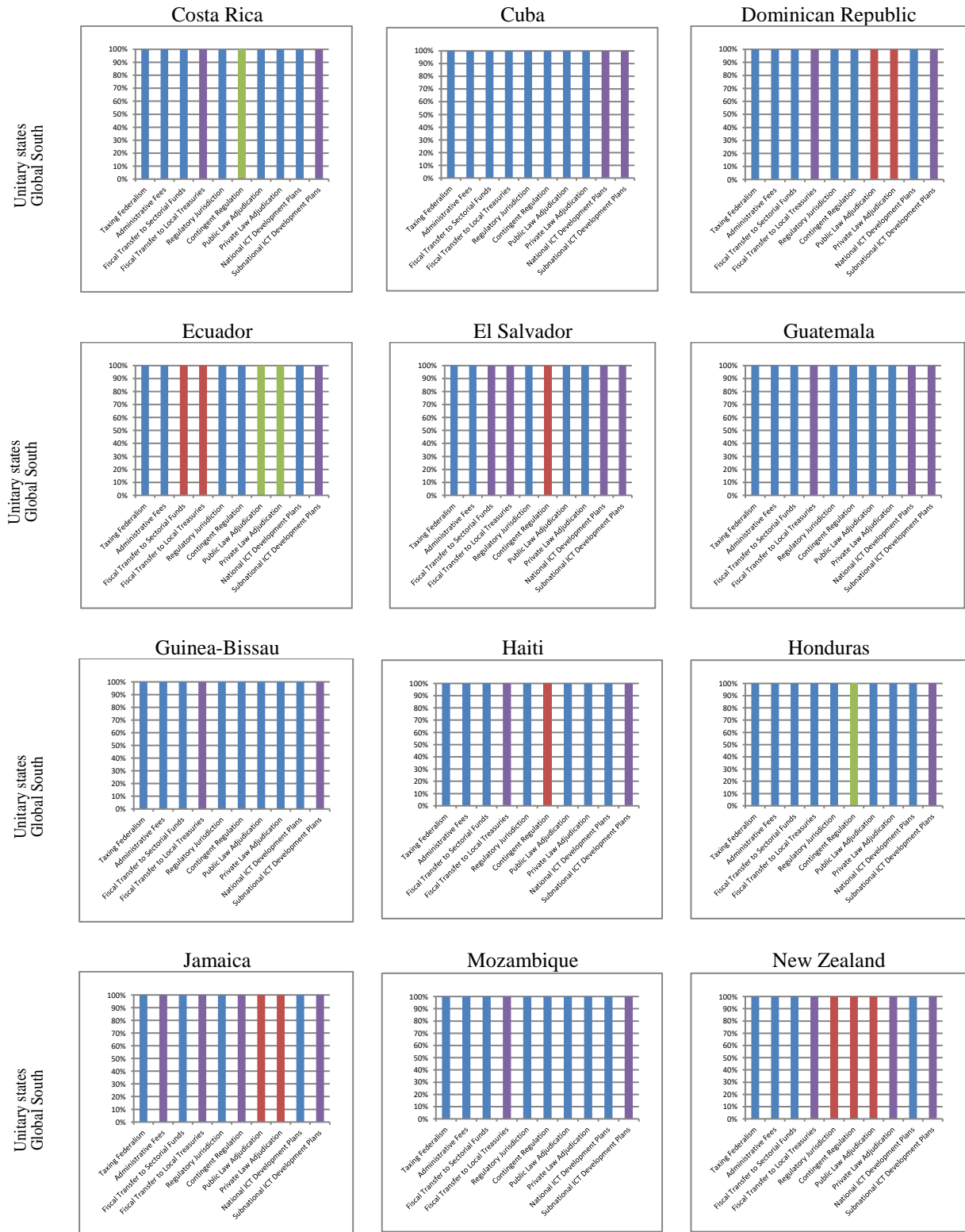
Figure 4: ICT federal variables per dimension in the Global South (Unitary States)

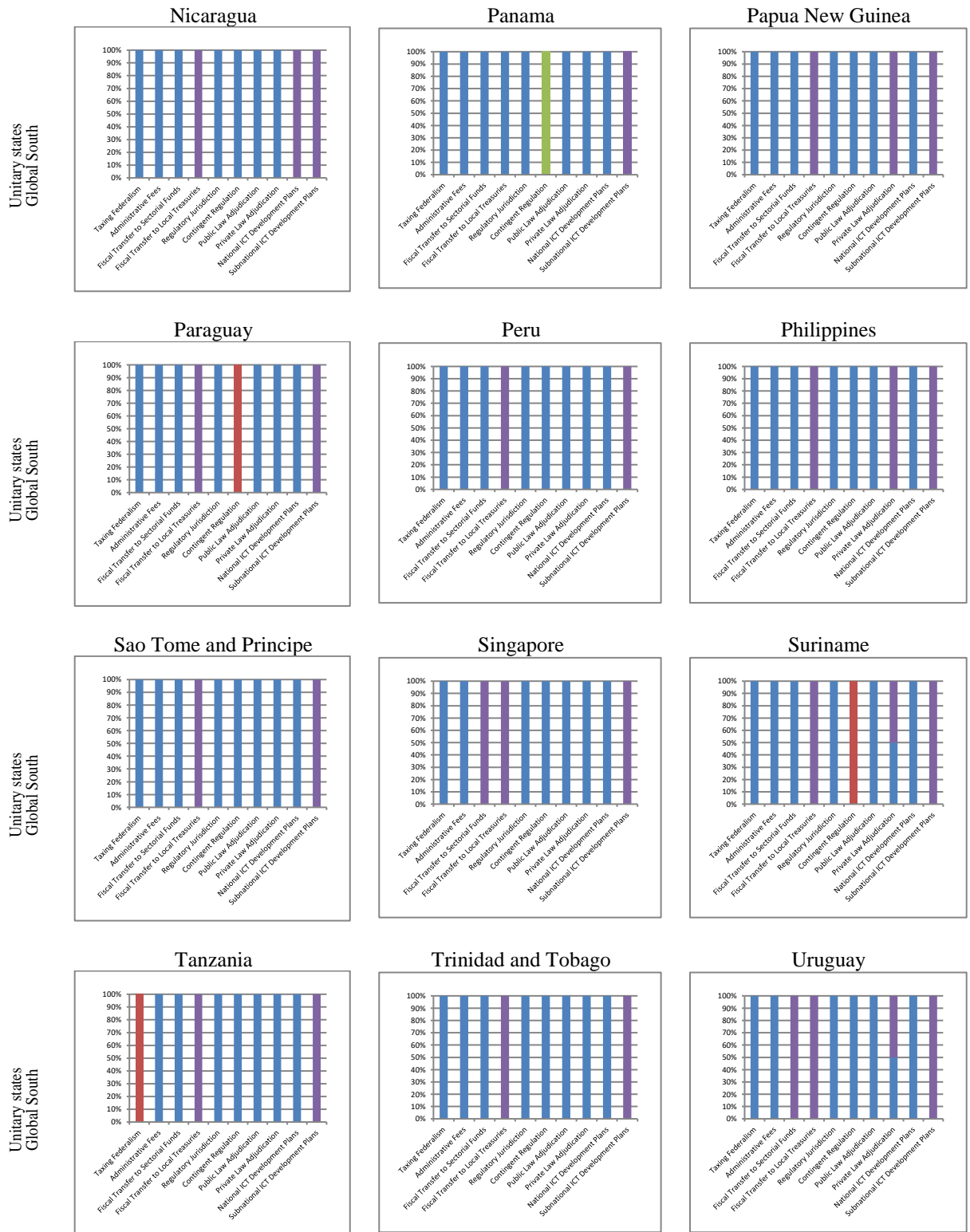
The same line of reasoning can be adopted to show the expected behavior of unitary and federal states according to ICT federal indicators on taxation, administrative fees, fiscal transfer to national and local funds, regulatory jurisdiction, contingent regulation, public and private law adjudicatory jurisdiction, national and subnational ICT development plans, and media content quota regulation, which provide a more granulated approach that shows disparities between expected behavior and official categorization of governmental and constitutional structure.

TELECOM, BROADCAST, BROADBAND, AND E-COMMERCE FEDERAL INDICATORS

One step forward by digging into the federal indicators and one may see a more granulated depiction of each country’s centralized, decentralized or interdependent presentations for the ICT sector. By isolating countries’ variables, ICT federal indicators exemplified below (Figure 5) finally devise their actual federal or unitary behavior. It shows the Telecommunications Federal Indicators of a set of countries from the Global South, where red portrays a typical federal presentation, green portrays a decisive more acute federal presentation, blue represents a typical unitary presentation, and purple depicts the lack of specific legal or regulatory framework towards centralization, decentralization or interdependent features.



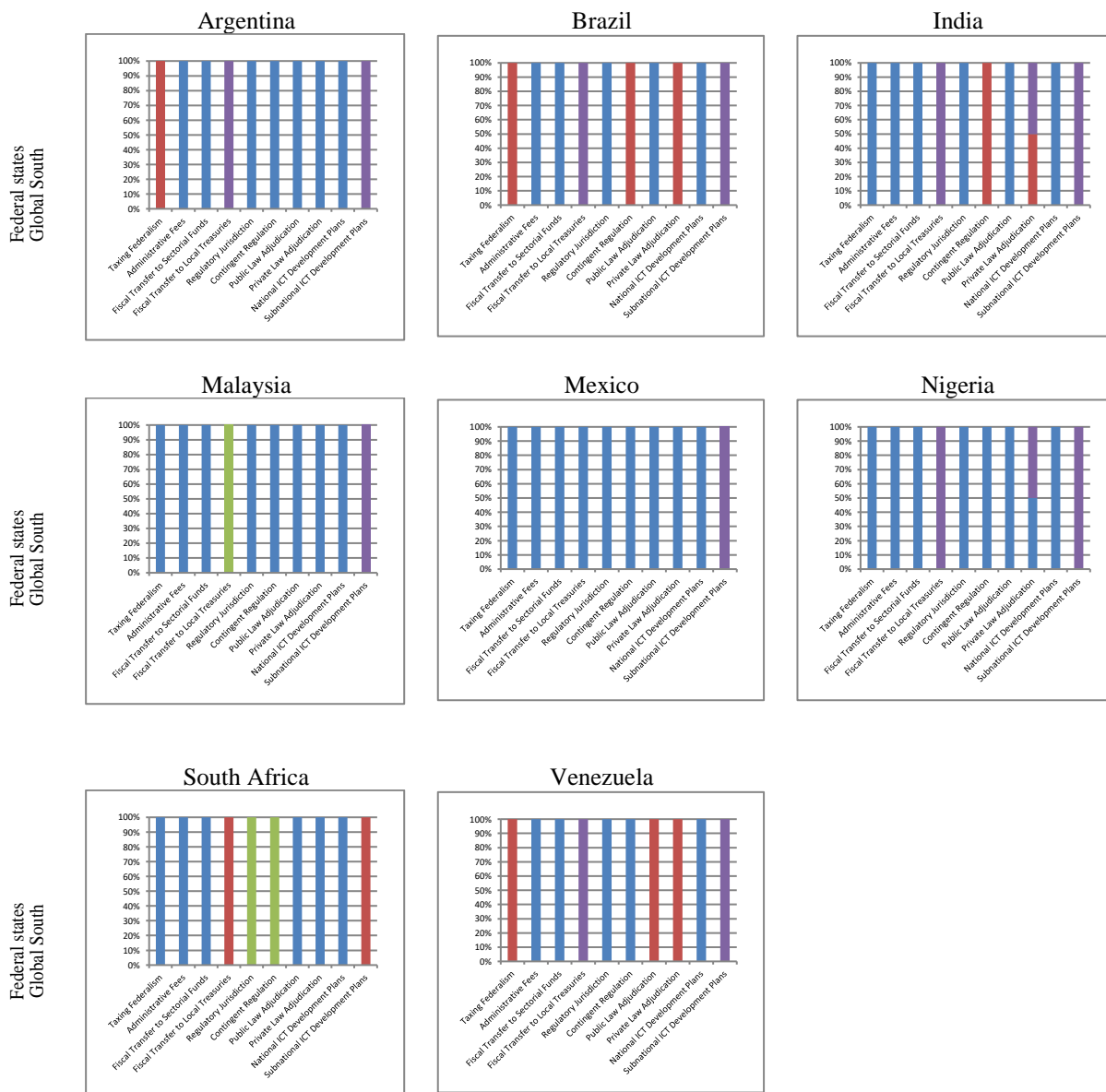




Stacked bar charts depicting TELECOM federal indicators, in which the blue color represents national centralization features, red represents subnational decentralization features, green represents national-subnational interdependence, and purple represents the absence of regulation. Charts generated using TLICS model tables available at www.getel.ndsr.org/research1.html.

Figure 5: TELECOM federal indicators in the Global South (Unitary Countries)

This line of reasoning can be replicated for the federal countries in the Global South with apparent unitary features in all of them, as shown in Figure 6 below.



Stacked bar charts depicting TELECOM federal indicators, in which the blue color represents national centralization features, red represents subnational decentralization features, green represents national-subnational interdependence, and purple represents the absence of regulation. Charts generated using TLICS model tables available at www.getel.ndsr.org/research1.html.

Figure 6: TELECOM federal indicators in the Global South (Federal Countries)

One striking characteristic shown in Figures 5 and 6 is precisely the fact that no matter what the official geographic division of power is, federal- and unitary-like arrangements are often found in the same ICT sector. It is so, for example, in South Africa, in which the revenue dimension shows unitary features, while the regulatory dimension depicts the quintessence of a federal state. Situated on a diametrically opposite side, Mexico, which was supposed to show strong federal features, is actually a role model of a unitary-like arrangement of government. The examples go on and on, as the analysis of each country’s federal features show traces of them in most of unitary countries and their absence in most federal countries, urging the interpreter to go beyond the official qualification of a country in order to make assertions based on similar institutional backgrounds.

WHAT COUNTRIES SHARE SIMILAR INSTITUTIONAL BACKGROUNDS?

After pinpointing ICT federal indicators for each country that was analyzed, it is time to reorganize them accordingly. By ascribing centralized, decentralized or interdependent features for the Global South, on the grounds that those aspects are the most prominent ones which characterize federalism, the Tables 2 to 9 below identify clusters of federal commonalities, making evident the detachment between constitutional federal attributions and the actual behavior of a country. States that behave differently than expected, say manifesting federal features when they are unitary countries or unitary features by federal countries, are highlighted bold in Tables 2 to 9 below.

Indicator	Sector	Federal Behavior	Unitary Behavior	Absent Behavior
	Telecom	Argentina, Brazil, Colombia , Tanzania , Venezuela	Angola, Belize, Bolivia, Cabo Verde, Chile, Costa Rica, Cuba, Ecuador, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, India , Jamaica, Malaysia , Mexico , Mozambique, Nigeria , Mozambique, New Zealand, Nicaragua, Panama, Papua New Guinea, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, South Africa , Singapore, Suriname, Trinidad Tobago, Uruguay	
	Broadcast	Argentina, Colombia , Nigeria, Tanzania , Venezuela	Angola, Belize, Cabo Verde, Chile, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Jamaica, Mexico , Mozambique, New Zealand, Nicaragua, Panama, Papua New Guinea, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, Suriname, Trinidad Tobago, Uruguay	Brazil, Bolivia, Ecuador
Tax	Broadband	Argentina, Brazil, Colombia , Tanzania , Venezuela	Belize, Bolivia, Chile, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Jamaica, Mexico , New Zealand, Nicaragua, Nigeria , Panama, Paraguay, Peru, Phillipines, Singapore, Suriname, Trinidad Tobago, Uruguay	Angola, Cabo Verde, Mozambique, Papua New Guinea, Sao Tome and Principe
	e-Commerce	Argentina, Brazil, Colombia , Tanzania , Venezuela	Bolivia, Chile, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Nigeria , Paraguay, Peru, Phillipines, Singapore, Suriname, Trinidad and Tobago	Angola, Belize, Cabo Verde, Costa Rica, Guinea-Bissau, Haiti, Mexico, Mozambique, New Zealand, Nicaragua, Panama, Papua New Guinea, Sao Tome and Principe, Uruguay

Table 2: Global South according to the Federal Indicator on Taxation

Indicator	Sector	Federal Behavior	Unitary Behavior	Absent Behavior
Administrative Fees	Telecom		Angola, <u>Argentina</u> , <u>Brazil</u> , Belize, Bolivia, Cabo Verde, Chile, Colombia, Costa Rica, Cuba, Ecuador, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, <u>Mexico</u> , Mozambique, New Zealand, Nicaragua, <u>Nigeria</u> , Panama, Papua New Guinea, Paraguay, Peru, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad Tobago, Uruguay, <u>Venezuela</u>	Jamaica, Philippines
	Broadcast	Nigeria, <u>Tanzania</u>	Angola, <u>Argentina</u> , <u>Brazil</u> , Belize, Bolivia, Cabo Verde, Chile, Colombia, Costa Rica, Cuba, Ecuador, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Jamaica, <u>Mexico</u> , Mozambique, New Zealand, Nicaragua, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Sao Tome and Principe, Singapore, Suriname, Trinidad Tobago, Uruguay, <u>Venezuela</u>	
	Broadband		<u>Argentina</u> , <u>Brazil</u> , Belize, Bolivia, Chile, Colombia, Costa Rica, Cuba, Ecuador, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, <u>Mexico</u> , Nicaragua, <u>Nigeria</u> , Panama, Paraguay, Peru, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad Tobago, Uruguay, <u>Venezuela</u>	Angola, Cabo Verde, Jamaica, Mozambique, New Zealand, Papua New Guinea, Philippines
	e-Commerce		Guatemala, Honduras, <u>Mexico</u> , Nicaragua, Trinidad and Tobago	Remaining countries

Table 3: Global South according to the Federal Indicator on Administrative Fees

Indicators	Sector	Federal Behavior	Unitary Behavior	Absent Behavior
Regulatory jurisdiction	Telecom	<u>Angola</u> , <u>Bolivia</u> , <u>New Zealand</u>	<u>Argentina</u> , <u>Brazil</u> , <u>Mexico</u> , Belize, Cabo Verde, Chile, Colombia, Costa Rica, Cuba, Ecuador, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Jamaica, Mozambique, Nicaragua, <u>Nigeria</u> , Panama, Papua New Guinea, Paraguay, Peru, Philippines, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad and Tobago, Uruguay, <u>Venezuela</u>	
	Broadcast	<u>Bolivia</u> , <u>Tanzania</u>	Angola, <u>Argentina</u> , <u>Brazil</u> , <u>Mexico</u> , Belize, Cabo Verde, Chile, Colombia, Costa Rica, Cuba, Ecuador, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Jamaica, Mozambique, New Zealand, Nicaragua,	

		<u>Nigeria</u> , Panama, Papua New Guinea, Paraguay, Peru, Philippines, Sao Tome and Principe, Singapore, Suriname, Trinidad and Tobago, Uruguay, <u>Venezuela</u>	
Broadband	<u>Bolivia</u>	<u>Argentina</u> , <u>Brazil</u> , <u>Mexico</u> , Belize, Chile, Colombia, Costa Rica, Cuba, Ecuador, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Jamaica, Mozambique, New Zealand, Nicaragua, <u>Nigeria</u> , Panama, Paraguay, Peru, Singapore, Suriname, Tanzania, Trinidad and Tobago, Uruguay, <u>Venezuela</u>	Angola, Cabo Verde, Papua New Guinea, Philippines, Sao Tome and Principe
e-Commerce	Brazil	Angola, Ecuador, Belize, Dominican Republic, Guatemala, Honduras, <u>Mexico</u> , New Zealand, Nicaragua, <u>Nigeria</u> , Philippines, Singapore, Tanzania, Trinidad and Tobago	Remaining countries

Table 4: Global South according to the Federal Indicator on Regulatory Jurisdiction

Indicators	Sector	Federal Behavior	Unitary Behavior	Absent Behavior
	Telecom	Brazil, <u>Cabo Verde</u> , <u>Chile</u> , <u>Colombia</u> , <u>Costa Rica</u> , <u>El Salvador</u> , <u>Haiti</u> , <u>Honduras</u> , <u>New Zealand</u> , <u>Panama</u> , <u>Paraguay</u>	Angola, Bolivia, Costa Rica, Cuba, Ecuador, Dominican Republic, Guatemala, Guinea-Bissau, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Papua New Guinea, Peru, Philippines, Sao Tome and Principe, Singapore, Tanzania, Trinidad and Tobago, Uruguay, <u>Venezuela</u>	Argentina, Belize, Jamaica, Suriname
Contingent Regulation	Broadcast	Brazil, <u>Chile</u> , <u>Colombia</u> , <u>Costa Rica</u> , <u>El Salvador</u> , <u>Haiti</u> , <u>Honduras</u> , <u>New Zealand</u> , <u>Panama</u> , <u>Paraguay</u>	Angola, <u>Argentina</u> , Bolivia, Cabo Verde, Costa Rica, Cuba, Ecuador, Dominican Republic, Guatemala, Guinea-Bissau, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Papua New Guinea, Philippines, Sao Tome and Principe, Singapore, Trinidad and Tobago, Uruguay, <u>Venezuela</u>	Belize, Jamaica, Peru, Suriname, Tanzania
	Broadband	Brazil, <u>Chile</u> , <u>Colombia</u> , <u>Costa Rica</u> , <u>El Salvador</u> , <u>Haiti</u> , <u>Honduras</u> , <u>New Zealand</u> , <u>Panama</u> , <u>Paraguay</u>	Angola, Bolivia, Costa Rica, Cuba, Ecuador, Dominican Republic, Guatemala, Guinea-Bissau, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Peru, Philippines, Singapore, Tanzania, Trinidad and Tobago, Uruguay, <u>Venezuela</u>	Argentina, Belize, Cabo Verde, Jamaica, Papua New Guinea, Sao Tome and Principe, Suriname
	e-Commerce	Brazil, Canada, <u>Chile</u> , <u>Colombia</u> , <u>Haiti</u> , <u>Peru</u>	Angola, Bolivia, Cuba, Ecuador, <u>Mexico</u> , New Zealand, Nicaragua, <u>Nigeria</u> , Panama, Philippines, Singapore, Tanzania, Trinidad and Tobago	Remaining countries

Table 5: Global South according to the Federal Indicator on Contingent Regulation

Indicator	Sector	Federal Behavior	Unitary Behavior	Absent Behavior
Public Law Adjudication	Telecom	<u>Angola, Belize, Cabo Verde, Colombia, Dominican Republic, Ecuador, Jamaica, New Zealand</u> , Venezuela.	<u>Argentina, Brazil</u> , Bolivia, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Panama, Papua New Guinea, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad Tobago, Uruguay	
	Broadcast	<u>Belize, Colombia, Dominican Republic, Ecuador, Jamaica, Tanzania</u> , Venezuela	Angola, <u>Argentina, Brazil</u> , Bolivia, Cabo Verde, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, <u>Mexico</u> , Mozambique, New Zealand, Nicaragua, <u>Nigeria</u> , Panama, Papua New Guinea, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, Suriname, Trinidad Tobago, Uruguay	
	Broadband	<u>Belize, Colombia, Dominican Republic, Ecuador, Jamaica, New Zealand</u> , Venezuela.	<u>Argentina, Brazil</u> , Bolivia, Cabo Verde, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Panama, Paraguay, Peru, Phillipines, Singapore, Suriname, Tanzania, Trinidad Tobago, Uruguay.	Angola, Papua New Guinea, Sao Tome and Principe
	e-Commerce	<u>Belize, Colombia, Dominican Republic, Ecuador, Jamaica</u> , Venezuela,	Bolivia, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Haiti, Honduras, <u>Mexico</u> , Nicaragua, <u>Nigeria</u> , Paraguay, Peru, Phillipines, Singapore, Suriname, Tanzania, Trinidad and Tobago, Uruguay	Angola, Argentina, Cabo Verde, Guinea-Bissau, Mozambique, New Zealand, Panama, Papua New Guinea, Sao Tome and Principe

Table 6: Global South according to the Federal Indicator on Public Law Adjudication

Indicator	Sector	Federal Behavior	Unitary Behavior	Absent Behavior
Private Law Adjudication	Telecom	<u>Belize, Brazil, Cabo Verde, Colombia, Dominican Republic, Ecuador, Jamaica</u> , Venezuela	<u>Angola, Argentina</u> , Bolivia, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Panama, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad Tobago, Uruguay	New Zealand, Papua New Guinea
	Broadcast	<u>Belize, Brazil, Colombia, Dominican Republic, Ecuador, Jamaica, Tanzania</u> , Venezuela	<u>Angola, Argentina</u> , Bolivia, Cabo Verde, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Panama, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, Suriname, Trinidad Tobago, Uruguay	New Zealand, Papua New Guinea

Broadband	<u>Belize</u> , Brazil, <u>Colombia</u> , <u>Dominican Republic</u> , <u>Ecuador</u> , <u>Jamaica</u> , Venezuela	Angola, <u>Argentina</u> , Bolivia, Cabo Verde, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Panama, Paraguay, Peru, Phillipines, Singapore, Suriname, Tanzania, Trinidad Tobago, Uruguay	New Zealand, Papua New Guinea, Sao Tome and Principe
e-Commerce	<u>Belize</u> , Brazil, <u>Colombia</u> , <u>Dominican Republic</u> , <u>Ecuador</u> , <u>Jamaica</u> , <u>New Zealand</u> , Venezuela	Bolivia, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Haiti, Honduras, <u>Mexico</u> , Nicaragua, <u>Nigeria</u> , Panama, Paraguay, Peru, Phillipines, Singapore, Suriname, Tanzania, Trinidad and Tobago, Uruguay	Angola, Argentina, Cabo Verde, Guinea-Bissau, Mozambique, Papua New Guinea, Sao Tome and Principe

Table 7: Global South according to the Federal Indicator on Private Law Adjudication

Indicator	Sector	Federal Behavior	Unitary Behavior	Absent Behavior
Content quota	Broadcast	<u>Tanzania</u>	<u>Argentina</u> , Belize, <u>Brazil</u> , Cabo Verde, Ecuador, Guatemala, Guinea-Bissau, Haiti, Jamaica, <u>Mexico</u> , Mozambique, Nicaragua, <u>Nigeria</u> , Phillipines, <u>Venezuela</u>	Angola, Bolivia, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Honduras, New Zealand, Panama, Papua New Guinea, Paraguay, Peru, Sao Tome and Principe, Singapore, Suriname, Trinidad Tobago, Uruguay
	Pay TV	<u>Tanzania</u>	<u>Argentina</u> , <u>Brazil</u> , Cabo Verde, Ecuador, Jamaica, Mozambique, Nicaragua, <u>Nigeria</u>	Angola, Belize, Bolivia, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Mexico, New Zealand, Panama, Papua New Guinea, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, Suriname, Trinidad Tobago, Uruguay, Venezuela
	Internet		Ecuador	Angola, Argentina, Belize, Bolivia, Brazil, Cabo Verde, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Guinea-Bissau, Haiti, Honduras, Jamaica, Mexico, Mozambique, New Zealand, Nicaragua, Nigeria, Panama, Papua New Guinea, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad Tobago, Uruguay, Venezuela

Table 8: Global South according to the Federal Indicator on Content Quota

Indicator	Sector	Federal Behavior	Unitary Behavior	Absent Behavior
Planning	Telecom		Angola, Argentina , Brazil , Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guinea-Bissau, Haiti, Honduras, Jamaica, Mexico , Mozambique, New Zealand, Nigeria , Panama, Papua New Guinea, Paraguay, Peru, Phillipines, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad Tobago, Uruguay, Venezuela	Belize, Cuba, El Salvador, Guatemala, Nicaragua
	Broadcast	Tanzania	Angola, Brazil , Colombia, Costa Rica, Dominican Republic, Ecuador, Guinea-Bissau, Haiti, Honduras, Jamaica, Mozambique, Nigeria , Panama, Papua New Guinea, Paraguay, Phillipines, Singapore, Suriname, Trinidad Tobago, Venezuela	Argentina, Belize, Bolivia, Chile, Cuba, El Salvador, Guatemala, Mexico, New Zealand, Nicaragua, Peru, Sao Tome and Principe, Uruguay
	Broadband		Angola, Brazil , Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guinea-Bissau, Haiti, Honduras, Jamaica, Mexico , Mozambique, New Zealand, Nigeria , Panama, Papua New Guinea, Paraguay, Peru, Sao Tome and Principe, Suriname, Tanzania, Trinidad Tobago, Uruguay, Venezuela	Argentina, Belize, Cuba, El Salvador, Guatemala, Nicaragua, Phillipines, Singapore
	e-Commerce		Angola, Bolivia, Mexico , Nigeria , Sao Tome and Principe, Suriname, Tanzania	Remaining countries

Table 9: Global South according to the Federal Indicator on Planning

Already, those clusters of countries with similar ICT federal features give us a glimpse of the scarcity of federal behavior in the federal indicators of planning, regulatory jurisdiction and administrative fees. Federal indicators of contingent regulation and private law adjudication are otherwise abundant even when unitary states are accounted for. Except for the federal indicator on taxation, all indicators show a misbehaving trend of federal and unitary states vesting features of the other party.

SIGNIFICANCE OF THE CATEGORICAL VARIABLES ON FEDERALISM

To test the significance of the relationship of the categorical variables on federalism and each atomized feature of centralization and decentralization/interdependence previously developed by applying TLICS model, we used 2x2 contingency tables, as shown in the example below (Table 12), that measure the degree of association between the category of federalism (0 for centralized, and 1 for decentralized/interdependent) and each ICT variable described by TLICS model (tax, administrative fees, fiscal transfer, regulatory jurisdiction, contingent regulation, private and public law adjudication, planning and media content).

Federalism	Tax Telecom		Total
	Centralized	Decentralized	
Yes	5	3	8
No	28	2	30
Total	33	5	38

Table 12: Contingency Table Example

Using Fischer exact test, only ICT tax was significantly associated with a country being classified as a federation, and only in the broadcast sector ($p = 0.029$). In the telecom sector, there was a tendency towards ICT tax being associated with a country being classified as a federation ($p = 0,053$). All other results showed no significant association between the variable federalism and each of the ICT variables extracted from each country's institutional background.

To compare the probability of the occurrence of decentralized features in federal and non-federal systems, we used a concept borrowed from biostatistics (Pagano & Gauvreau, 2000, p. 144). In this context, the relative risk is defined as the ratio of the probability of decentralization in a given group of federal countries to the probability of decentralization in a group of unitary countries. A measure of relative risk greater than one implies that the chance of a country having decentralized ICT variable is increased when it is categorized as federal.

The decentralization is measured in each aforementioned variable (tax, fees, transfers, regulation, adjudication, planning, media) per sector (telecom, broadcast, broadband, e-commerce) according to the following formula:

$$RR = \frac{P(\text{decentralization} \mid \text{exposed to federalism})}{P(\text{decentralization} \mid \text{unexposed to federalism})}$$

Using relative risk measure, the chance of a federal country having decentralized tax is 7 times greater than the chance of a non-federal country having decentralized tax in the broadcast sector. In the telecom sector, the chance of a federal country having decentralized tax is 8.4 times greater than the chance of a non-federal country having decentralized tax. However, this latter test was not significant. No other relative risk measure was significant in the remaining relationships. Moreover, in the broadcast sector, the odds of a decentralized tax variable in an official federal country, relative to a unitary country, are 13 to 1.

GLOBAL SOUTH ICT FEDERAL INDEX (IFI) AND ICT UNITARY INDEX (IUI)

The data collected in legal and regulatory frameworks of the states in the Global South can be amalgamated in all-encompassing indices of unitary – centralization – and federal features – decentralization and interdependence between national and subnational units. Those indices serve as a guideline to gather countries with similar institutional backgrounds and to show at a glimpse that each country has a particular relative position in relation to federal and unitary features. Those specific features may explain why development policy recipes have different effects in countries with officially similar institutional backgrounds. The three figures below show the Global South countries' depiction according to ICT federal index (IFI) and ICT unitary index (IUI).

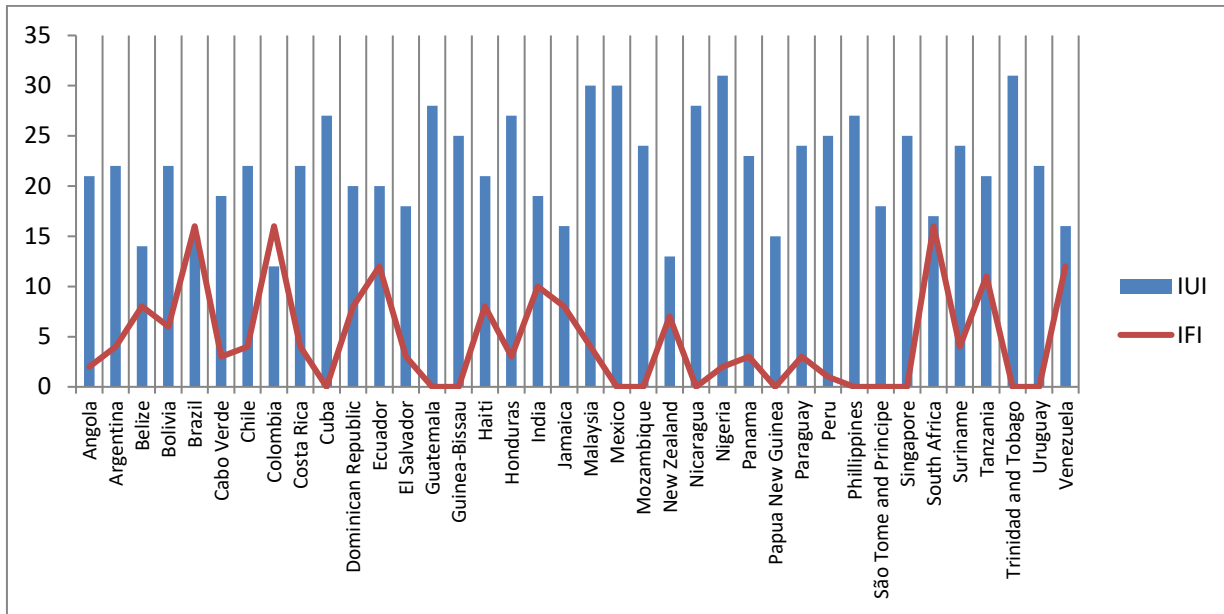


Figure 6: ICT Federal Index (IFI) and ICT Unitary Index (IUI) in the Global South

The disconnection between the official presentation of a country’s geographic organization of government and its real picture is quite clear in Figure 7. From the six countries with most prominent federal features – Brazil, Chile, Ecuador, South Africa, Tanzania and Venezuela –, only half are known as federal countries. Flipping a coin would give us the same results.

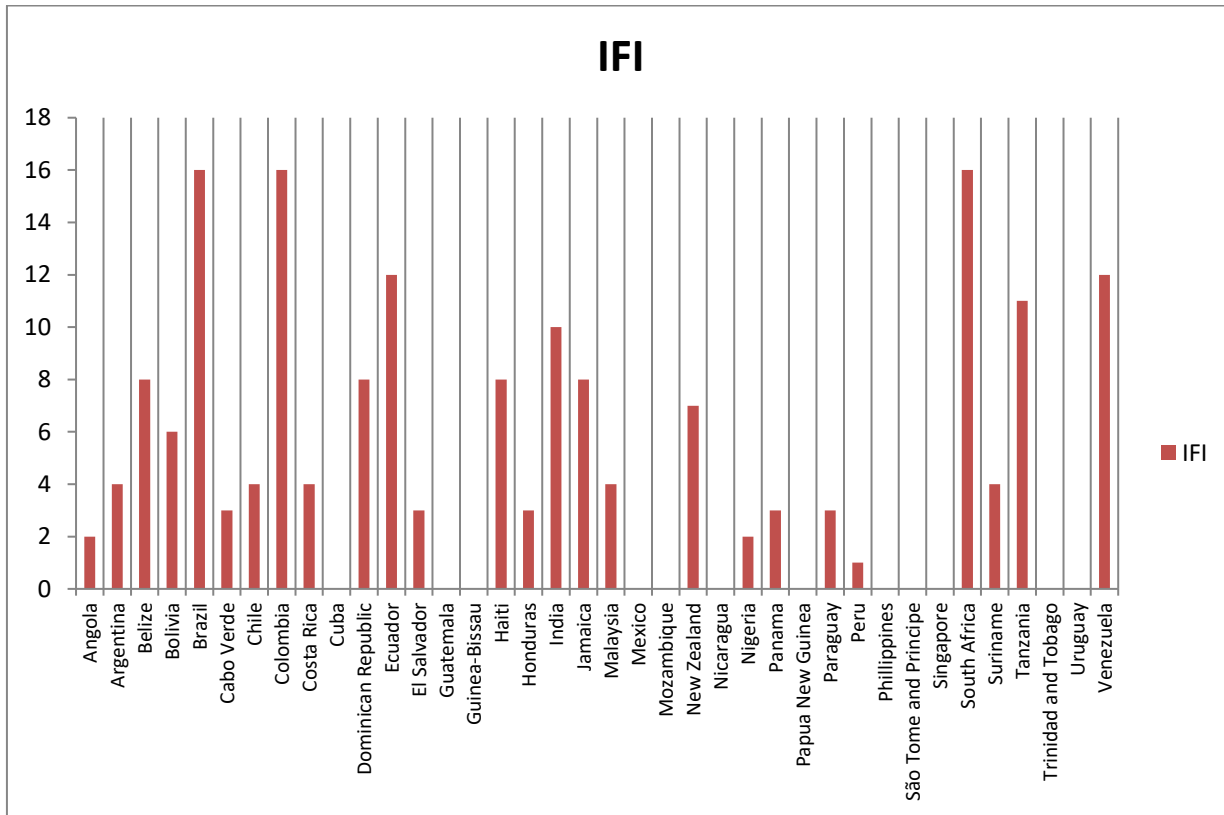


Figure 7: ICT Federal Index (IFI) in the Global South (All Sectors)

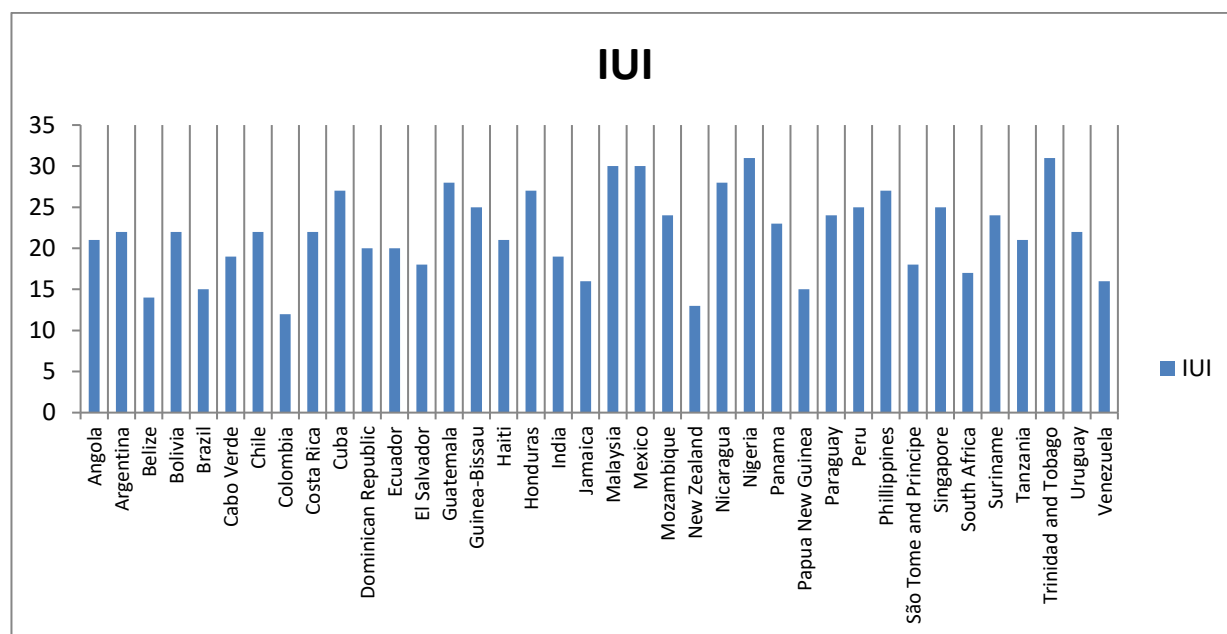


Figure 8: ICT Unitary Index (IUI) in the Americas Region (All Sectors)

CONCLUSIONS

To find out significant associations between public policies or market trends and development, federalism is a prominent subject matter. Not by chance, reliable data sets on the structural and institutional variables of countries is a needed step to reach sound comparative research. This paper addresses one of the most important descriptors of the institutional background: federalism.

The TLICS Model used in this article considers three main features of federalism – national sovereignty, subnational autonomy, and interdependent allocation of powers – and embeds 48 variables derived from the combination of indicators – tax, administrative fees, national funds, local treasuries, regulatory jurisdiction, contingent regulation, public law adjudication, private law adjudication, national and subnational ICT development plans, and content quota – and sectors – telecom, broadcast, broadband, and e-commerce.

After we analyzed an empirical universe that encompassed thirty-eight countries from the Global South, that form a potpourri of thirty officially unitary countries – Angola, Belize, Bolivia, Cabo Verde, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guinea Bissau, Haiti, Honduras, Jamaica, Mozambique, New Zealand, Nicaragua, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Sao Tome and Principe, Singapore, Suriname, Tanzania, Trinidad and Tobago, and Uruguay –, and eight federal countries – Argentina, Brazil, India, Malaysia, Mexico, Nigeria, South Africa, and Venezuela, the only ICT variable significantly associated with a country being classified as a federal state was tax in the broadcast sector.

The main contribution of this analysis, though, lies on the description of the relative position of each country according to federal ICT variables. When all countries are put together in a graph with decentralization and centralization scales (Figure 9), the misplacement of several countries are worthy of notice.

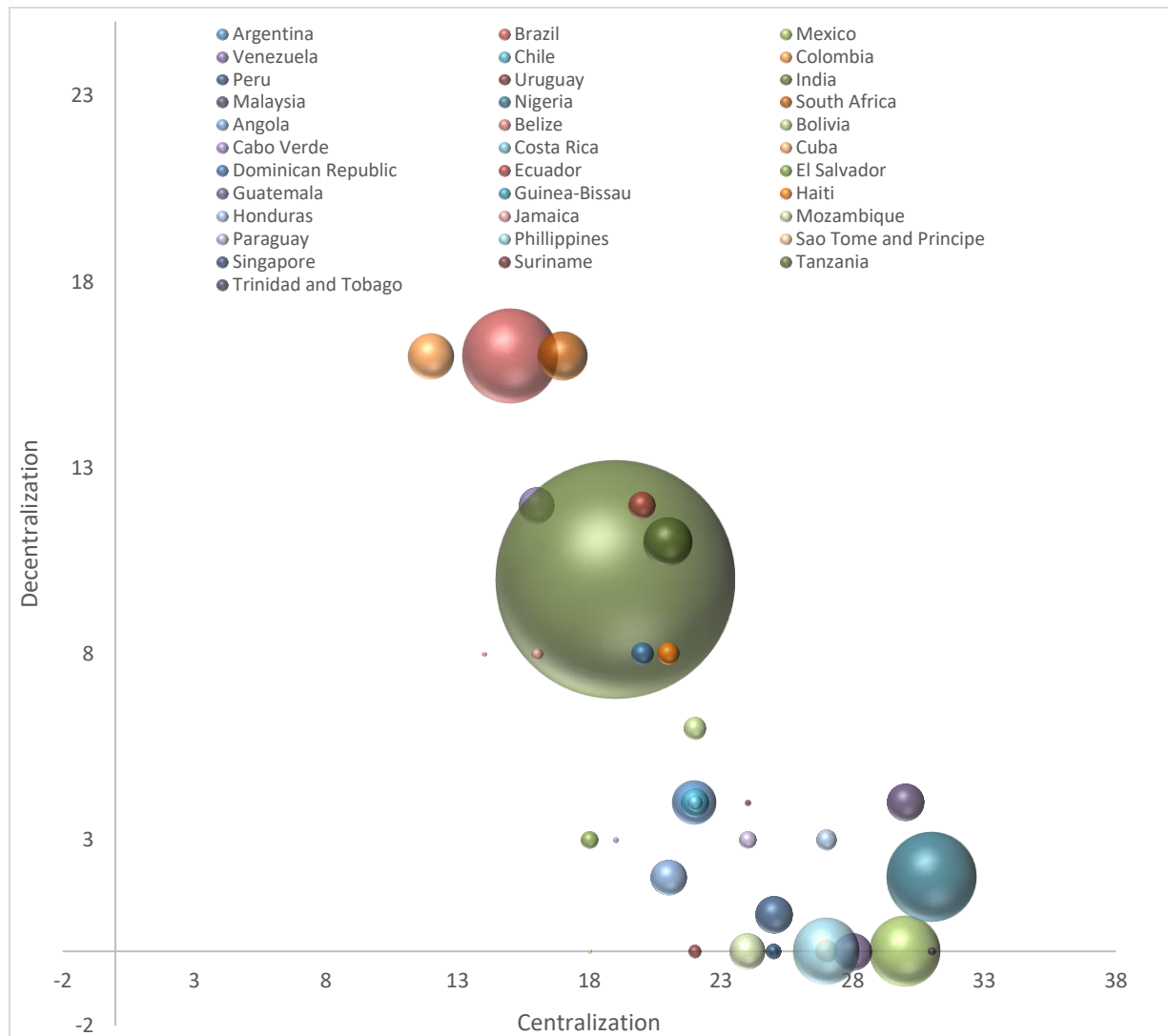


Figure 9: Distribution of Federal Variables in the Global South (All Sectors)

By tackling into the myriad of federal-like arrangements present in a representative number of countries in the Global South, this article unveiled 48 variables capable of depicting a more precise image of the countries’ institutional behavior in 4 sectors and 11 dimensions.

It also devised sets of countries with similar centralized or decentralized features for the ICT and Development comparative research with counterintuitive results. It is worth mentioning that no less than 10 countries behave in opposition to what would be expected as far as consumer regulation is accounted for. Unitary countries, such as Cabo Verde, Chile, Colombia, Costa Rica, El Salvador, Haiti, Honduras, New Zealand and Paraguay, when analyzed through the lenses of the TLICS Model, have striking federal-like characteristics of decentralization (see Table 5). By contrast, half of the federations will show centralized features in the ICT dimension of public law jurisdiction (see Table 6). Even more remarkable, not a single country behaves as a federal one in the administrative fee dimension, leading to the conclusion that the federal institutional variable is not suitable to differentiate among countries, be them federal or unitary, thus broadening the universe of the analysis of the impact of government administrative fees in, *e.g.*, universal access. Figure 9 shows the most counterintuitive results, as Colombia – a unitary country – scores the highest in federal-like features and the lowest in unitary ones. At the same time, three countries officially known as federations – Malaysia, Nigeria and Mexico – score the highest in unitary-like features and the lowest in federal-like characteristics among all countries analyzed. The data prove that the constitutional geographic division of powers is not sufficient to present the real institutional background for the ICT and Development research. It is actually a deceiving variable, which indicates that the institutional variable of federalism should be used in its atomized form described in the TLICS Model, taking into account the clusters of commonalities proposed above. As policy transfer from developed to developing countries

depends on “essential institutional underpinnings” (Minogue, 2005, p. 25), this article fills one institutional gap necessary to understand differences and commonalities in the institutional backgrounds of countries being compared for the objectives of the ICT and Development literature or the purposes of regulatory reforms in the developing world.

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