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VERTICAL FISCAL IMBALANCE: DO ECONOMIC GROWTH AND INCOME INEQUALITY MATTER?

Asim Bashir Khan

PhD Scholar Department of Economics and Finance,
IBA-Karachi

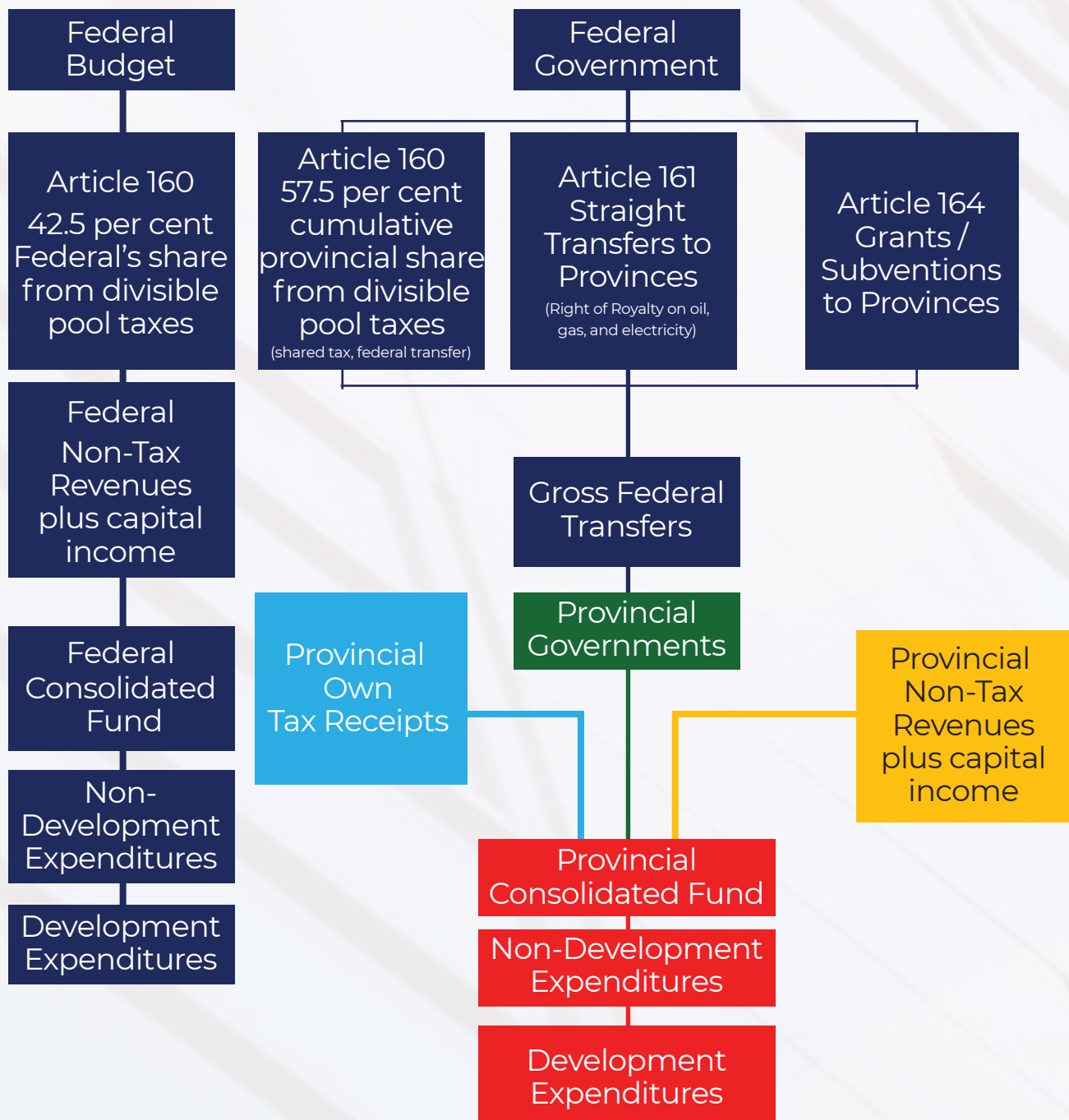
Supervisor: Dr Qaiser Munir



Introduction

- Sub-national governments depend on transfers from upper level of government. (Ruggeri, Wart, Robertson, & Howard, 1993) (Stein, 1999).
- This dependence gives rise to Vertical Fiscal Imbalance (Dollery, 2002), (Guo, 2008) and (Meloni, 2016).
- The empirical evidence suggests that VFI give rise to a moral hazard situation, and it is associated with low tax effort, higher debt accumulation and deficits. (Ahmad & Craig, 1997), (Collins, 2002), (Eyraud & Lusinyan, 2011), (Sharma, 2012).
- Subnational government substitute federal transfers over their own fiscal effort, called as Flypaper Effect (Brian, 2002)

Figure 1 The Intergovernmental Fiscal System of Pakistan



Source: Author's conceptualization from the Constitution of the Islamic Republic of Pakistan (Pakistan, National Assembly of, 1973) and fiscal system of Federal and Provincial governments.

Note: The distinctive color scheme is indicative of the direction and flow of the resources.

Figure 2 Pre & Post 18th Amendment Legislative and Actual Functional Responsibilities

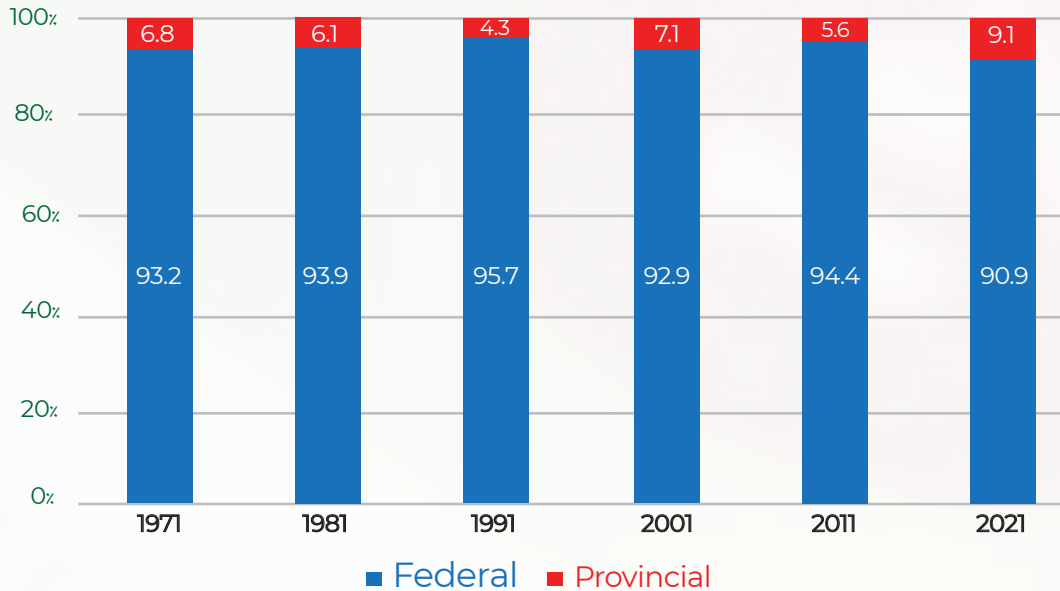
Legislative Functional Allocation Pre 18 th Amendment	Functions and Services	Actual Functional Allocation Pre 18 th Amendment 1973–2010	Legislative and Actual Functional Allocation Post 18 th Amendment
Federal Government	<ul style="list-style-type: none"> Defence External Affairs Post and telegraph Telephones Radio and TV Currency Foreign Exchange Foreign Aid Institutes for Research Nuclear Energy Ports and Aerodromes Shipping Air Service Stock Exchange National Highway Geological Surveys Censuses Meteorological Surveys Railways Mineral oil and Natural gas Industries 	Federal Government	Federal Government
Federal / Provincial Government	<ul style="list-style-type: none"> Population Planning Electricity (Except Karachi Electric) Curriculum Development Syllabus Planning Centers of Excellence Tourism Social Welfare Vocational/Technical Training Employment Exchange Historical Sites & Monuments 	Federal / Provincial Government	Provincial Government
Provincial Government	<ul style="list-style-type: none"> Law & Order Justice Highways Urban Transport Secondary & Higher education Agriculture Extension Distribution of Inputs Irrigation Land Reclamation 	Provincial Government	Provincial Government
Local Government	<ul style="list-style-type: none"> Curative Health Land Development Primary Education Preventive Health Farm-to-Market Roads Water Supply, Drainage and Sewerage 	Provincial / Local Government	Provincial / Local Government
	<ul style="list-style-type: none"> Link Roads Intra-Urban Roads Street Lighting Solid Waste Management Fire Fighting Parks, Playgrounds 	Local Government	Local Government

Source: Author's conceptualization from the Constitution of the Islamic Republic of Pakistan (Pakistan, National Assembly of, 1973) and fiscal system of Federal and Provincial governments.

Problem Description

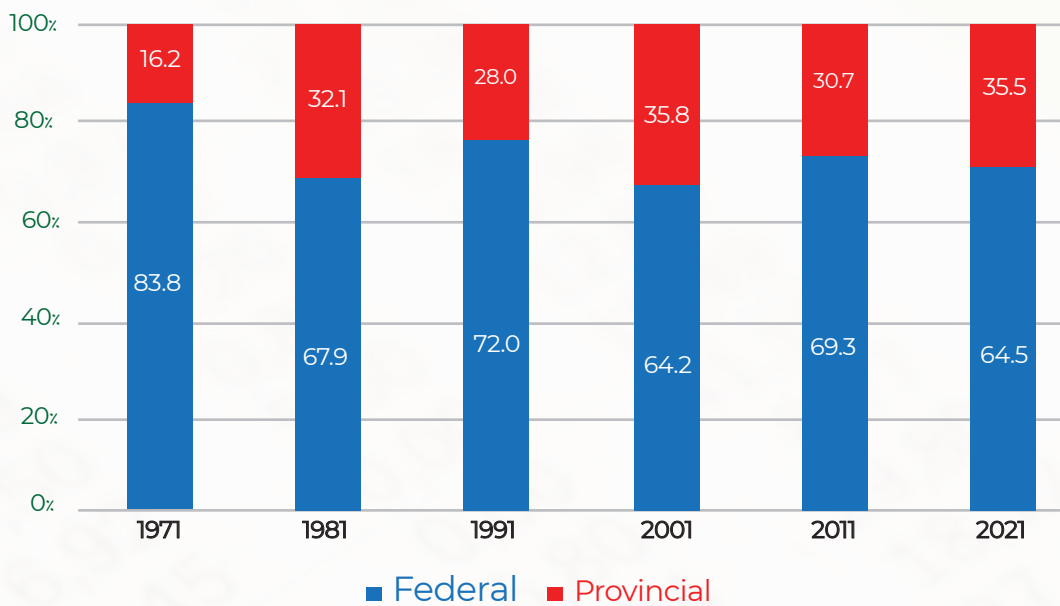
Low subnational taxation and fiscal capacity resulted in larger VFIs.

Figure 3 Federal and Provincial Position in Consolidated Revenues



Source: Author's computation from Annual Budget Statements, FBR Yearbook various issues

Figure 4 Federal and Provincial Position in Consolidated Expenditures



Source: Author's computation from Annual Budget Statements, FBR Yearbook various issues.

Objectives and Contribution

The objective of this study “Vertical Fiscal Imbalance: Do Economic Growth and Income Inequality Matter?” is to:

- study empirical characteristics of VFI
- explore how economic growth affect the VFI
- determine whether inequality affects VFI
- study the relationship between expenditure decentralization and VFI
- investigate the relationship of revenue effort of a subnational governments and its relation with VFI
- empirically analyze the effect of Eighteenth Amendment on imbalances
- validated if tax reforms are meaningful in reducing the imbalances
- study if same political party is ruling in center and province, what is likely effect on VFI.

I have used an exclusive public finance and energy data of provinces which is strongly balanced panel from 1971 to 2021. This is the pioneering and first study in Pakistan on this subject.

Background and Literature

The pioneering study on the subject is of (Hunter, 1974) summarizes a positive perspective on VFI with accounting relationships.

A critique and rejoinder on the study of (Hunter, 1974) was published by (G. Thimmaiah, 1976) primarily making normative arguments about the definitions of the different variables and defined VFI in terms of transfers dependency.

There are two important hypothetical situations, first $VFI=0$ suggests that the state/province can meet its entire expenditure from its own revenues and second $VFI=1$ which explains that state/province is fully dependent on transfers/loans and its own revenues are zero. Practically the VFI can never be either zero or one, so, the value of VFI is positive and should necessary lie in between $0 < VFI < 1$.

With context specification, different authors have used and suggested different measures and computational aspects of VFI (Karpowicz, 2012), (Eyraud & Lusinyan, 2013) and (Aldasoro & Seiferling, 2014) have used one of the most commonly used measure of vertical imbalance $VFI = 1 - \frac{r_{own}}{s_{own}}$ contextualizing the subnational own revenues and expenditures.

Not only the theoretical development on this subject is very much confined to certain specific dimensions, but the empirical literature too is evolving as of now. Much of the empirical literature in this context is about decentralization and its link with size of government (Marlow, 1988), (Wu & Lin, 2012) and (Cantarero & Perez, 2012).

However, about linkage of VFI and economic growth, an empirical study by (Cevik, 2014), (Cevik, 2017) on an unbalanced data of 858 municipalities of Moldova for a period 2005-2013, concluded the negative relationship between economic growth and VFI and the same effect for own revenue effort. Similarly, based on country level unbalanced data there are two very important studies, (Aldasoro & Seiferling, 2014) studied empirical relationship between VFI and public debt and concluded that VFIs and accumulation of debt are positively associated.

Data and Methodology

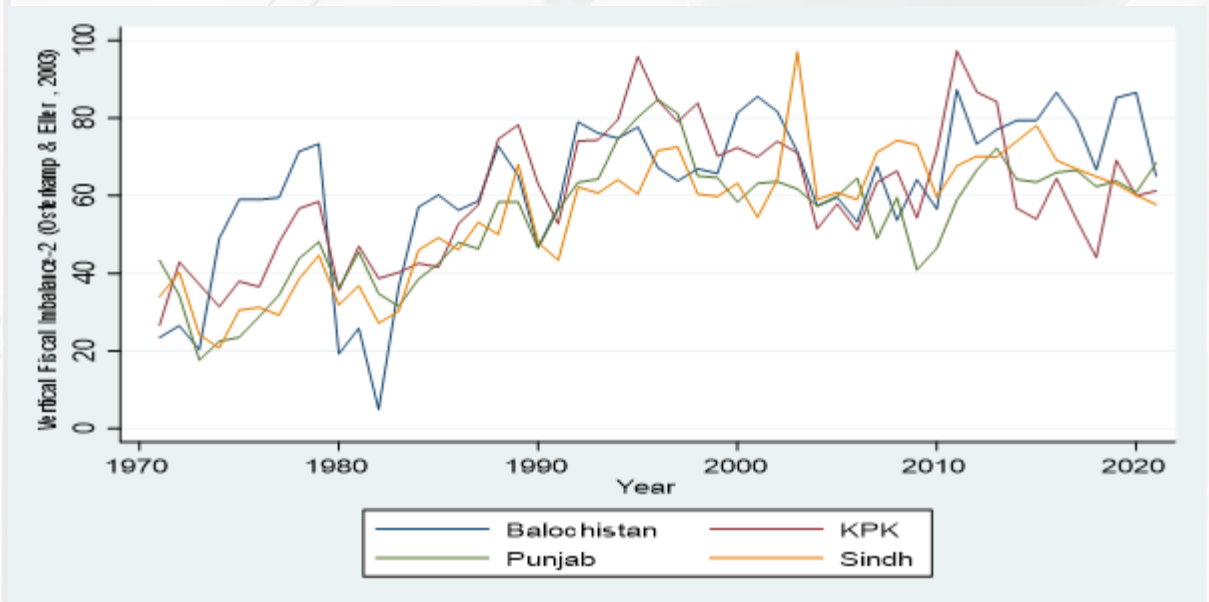
Dependent variable: Vertical Fiscal Imbalance, Definition of VFI proposed by (Osterkamp & Eller, 2003). Independent Variables: Economic Growth, Expenditure Decentralization, Population Growth, Horizontal Fiscal Imbalance (Income Inequality), Binary dummy variables: Eighteenth Amendment, Same Political Party in Centre and Province, Tax Reforms. Economic growth at provincial level is proxied through total energy consumption.

Methodology

Discroll Kraay Standard Error Random effect

Panel Corrected Standard Error Method Random effect

Figure 5 Vertical Fiscal Imbalance 1971-2021



Source: Author's computation from federal and provincial budget volumes from 1971-2021.

Hypotheses

- H1: The economic growth is negatively associated with VFIs at subnational.
- H2: Revenue effort is inversely related with VFIs.
- H3: Expenditure decentralization is positively associated with VFI.
- H4: High population growth rates have been exacerbating the VFIs.
- H5: Income inequality measured by Horizontal Fiscal Imbalances aggravates VFIs
- H6: Same political party in federal and provincial government will have a political patronage effect on government of province.

Econometric Specification

$$VFI_{it} = \alpha \text{Economic growth}_{it} + \beta HFI_{it} + \gamma X_{it} + \eta_i + v_t + \epsilon_{it}$$

Results of Baseline Regression

Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Economic growth	-0.25*** (-2.75)	-0.31** (-2.54)	-0.33*** (-3.60)	-0.33*** (-2.96)	-0.26*** (-3.16)	-0.29*** (-3.17)	-0.33*** (-3.63)	-0.28*** (-3.56)	-0.35*** (-3.73)	-0.29*** (-2.82)	-0.18** (-2.48)	-0.27*** (-2.94)
Revenue effort	-3.40*** (-2.79)	-4.78*** (-3.53)	-4.43*** (-3.43)	-2.77*** (-3.56)	0.94 (1.30)	-5.58*** (-3.46)	-6.15*** (-3.97)	-4.48*** (-4.01)	-3.16** (-2.05)	-3.19** (-2.64)	-3.10*** (-2.88)	-5.07*** (-3.04)
Expenditure decentralization		0.63*** (4.82)	0.77*** (5.46)	0.59*** (5.14)	0.38*** (3.77)	0.73*** (5.61)	0.79*** (5.59)	0.73*** (5.30)	0.76*** (5.02)	0.58*** (4.59)	0.02 (0.12)	0.68*** (4.82)
Population growth			2.85 (1.65)	1.20 (0.73)	0.59 (0.49)	1.41 (0.72)	1.87 (1.04)	2.79* (1.68)	3.50* (2.00)	1.19 (0.75)	0.51 (0.46)	1.52 (0.87)
HFI-1				1.30*** (3.38)						1.17*** (3.86)		
HFI-2					0.90*** (6.18)						0.66*** (6.04)	
HFI-3						0.21* (1.98)						0.22** (2.58)
Eighteenth amendment							9.06*** (3.26)			2.49 (0.72)	5.06** (2.33)	5.16* (1.97)
Political party								8.65** (2.66)		7.13*** (2.91)	7.07*** (3.45)	6.93** (2.35)
Tax reforms									-4.92 (-1.56)	-1.04 (-0.50)	7.40*** (3.07)	-6.29* (-2.00)
Observations	204	204	204	204	204	204	204	204	204	204	204	204
Within R ²	0.16	0.26	0.28	0.42	0.52	0.31	0.32	0.36	0.29	0.48	0.59	0.41
Number of groups	4	4	4	4	4	4	4	4	4	4	4	4

Regression with Interaction Terms

$$VFI_{it} = \alpha_1 \text{Economic growth}_{it} + \alpha_2 \text{Economic growth}_{it} * 18\text{th Amendment} + \alpha_3 \text{Economic growth}_{it} * \text{Tax reforms}_{it} + \alpha_4 \text{Economic growth}_{it} * \text{Political party}_{it} + \beta_1 \text{HFI}_{2,it} + \beta_2 \text{HFI}_{2,it} * 18\text{th amendment}_{it} + \beta_3 \text{HFI}_{2,it} * \text{Tax reforms}_{it} + \beta_4 \text{HFI}_{2,it} * \text{Tax reforms}_{it} + \gamma X_{it} + \eta_i + v_t + \varepsilon_{it}$$

Independent Variables	(1) DK-RE	(2) DK-RE	(3) DK-RE	(4) DK-RE	(5) DK-RE	(6) DK-RE	(7) PCSE	(8) PCSE	(9) PCSE	(10) PCSE	(11) PCSE	(12) PCSE
Economic growth	-0.32*** (-3.47)	-0.29*** (-2.99)	-0.44** (-2.62)	-0.33*** (-3.63)	-0.34*** (-3.70)	-0.23*** (-2.77)	-0.32*** (-3.42)	-0.29*** (-3.01)	-0.44*** (-4.06)	-0.33*** (-3.60)	-0.34*** (-3.71)	-0.23*** (-2.64)
Revenue effort	-4.41*** (-3.39)	-4.34*** (-3.30)	-4.59*** (-3.46)	-6.12*** (-3.87)	-3.22** (-2.01)	-3.36*** (-3.86)	-4.41*** (-7.46)	-4.34*** (-7.34)	-4.59*** (-7.75)	-6.12*** (-7.61)	-3.22*** (-3.17)	-3.36*** (-6.26)
Expenditure decentralization	0.79*** (5.68)	0.80*** (5.77)	0.74*** (5.84)	0.79*** (5.58)	0.76*** (5.08)	0.65*** (5.50)	0.79*** (6.07)	0.80*** (6.23)	0.74*** (5.91)	0.79*** (6.34)	0.76*** (5.83)	0.65*** (5.92)
Population growth	2.86 (1.66)	2.82 (1.60)	2.54 (1.45)	1.87 (1.03)	3.48* (1.98)	2.70* (1.76)	2.86*** (2.80)	2.82*** (2.82)	2.54** (2.42)	1.87* (1.74)	3.48*** (3.13)	2.70*** (2.82)
Growth*18th amendment	-0.23 (-1.46)						-0.23 (-0.53)					
Growth*Tax reforms		-0.34* (-1.81)						-0.34 (-1.31)				
Growth*Political party			0.35 (1.43)						0.35* (1.95)			
HFI*18th amendment				0.93*** (2.98)						0.93*** (3.04)		
HFI*Tax reforms					-0.50 (-1.56)						-0.50 (-1.47)	
HFI* Political Party						0.55*** (7.74)						0.55*** (7.95)
Observations	204	204	204	204	204	204	204	204	204	204	204	204
R-squared	0.47	0.47	0.30	0.31	0.29	0.45	0.28	0.29	0.30	0.31	0.29	0.45
Number of groups, id	4	4	4	4	4	4	4	4	4	4	4	4

Results

- There is a negative relationship between VFI and economic growth.
- The VFI is highly responsive against improvement in own source revenues, and this proves to be the most significant of all factors.
- The increase in expenditure decentralization increases the transfer dependency and VFI.
- Population growth is positively associated with VFI, which is logical when majority population is out of tax net, and large part of economy is undocumented.
- Horizontal imbalances, inequality of income and fiscal capacities across subnational governments further aggravate the vertical imbalances.
- Same political party in center and provinces is likely to create a situation of collusion and political patronage based on same party, this certainly will increase transfer dependency.
- Devolution in relation to growth will cast a corrective effect on VFI because growth will induce fiscal expansion financed through own source revenues.
- The interaction of growth and tax reforms dummy does have a corrective effect on VFI.
- The coefficient of interaction variable of growth and political party dummy have adverse effect on VFI which signifies political patronage effect as explained.
- The interaction of HFI with 18th amendment and political party dummy variable have an adverse effect on VFI and both are significant, Interaction of HFI with tax reforms does have corrective effect but statistically insignificant.

Policy Recommendation

This research calls the need for inclusive political dialogue to avoid coordination failure, political patronage and meaningful tax reforms at provincial level.

Key Words

VFI, Economic Growth, Inequality, Decentralization, Revenue Effort

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This poster presentation is part of my PhD Dissertation "Essays in Public Finance and Fiscal Federalism" in Department of Economic and Finance, School of Economics and Social Sciences, Institute of Business Administration, Karachi.

First Essay: Vertical Fiscal Imbalance: Do Economic Growth and Inequality Matter?

Second Essay: Subnational Debt: Contextualizing Imbalances and Intergovernmental Fiscal Relations

Third Essay: Linking Subnational Fiscal Performance to Vertical Fiscal Imbalance and Reforms