MUNICIPALITIES' PARTICIPATION FUND AND ITS CONTRIBUTION TO INEQUALITY REDUCTION IN MATO GROSSO, BRAZIL

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Fortaleza, April 28th, 2014



- Mato Grosso's economic heterogeneity
- 141 municipalities
- Share of municipalities GDP in the State's GDP
- 2001:
 - Richest 15 municipalities: 62%
 - Poorest 15: 0.57%
- 2010:
 - Richest 15 municipalities: 61%
 - Poorest 15: 0.73%
- BRASIL IBGE (2013)





- 70% of those 141 municipalities have GDP per capita smaller than the national average
- At the same time, municipalities like Sorriso, Lucas do Rio Verde, Sapezal and others are among the highest GDP per capita in the country
- With 5565 municipalities in Brazil, Mato Grosso has 7 in the top 10% according to the municipal Human Development Index (HDI) of 2010, calculated by the United Nations **Development Programme (UNDP)**
- 8 (5.7%) municipalities above the HDI national average



- National Constitution: Governmental transfers to States and municipalities
 - quota share of the Goods and Services Tax (GST) of each city
 - Municipalities' Participation Fund (MPF)
 would act as a policy to reduce inequalities and eradicate poverty
- In fact, we argue:

Is this governmental transfer system, with emphasis on the Goods and Services Tax (GST) and on the Municipalities' Participation Fund (MPF), helping to have economic growth and to reduce GDP per capita inequalities among municipalities of Mato Grosso, in the period 2001-2010?





- Goal: to investigate how the intergovernmental transfer policies, with emphasis in the Municipalities' Participation Fund (MPF) and the quota share of the Goods and Services Tax (GST) of each city, contribute to the growth of per capita GDP between the years 2001 and 2010.
- Specifically:
 - an Exploratory Spatial Data Analysis (ESDA) of growth and GDP components;
 - an analysis of the effect of GST and MPF over GDP per capita growth;
 - a methodological proposal for the intergovernmental transfers of MPI (Municipalities Participation Index) and MPF in Mato Grosso State.



- Exploratory Spatial Data Analysis (ESDA) Moran's I and Anselin's LISA
- Growth econometric model based in Barro and Salai-Martin (1992)
- Annual data from 2001 to 2010 at municipal level







Brazilian State of Mato Grosso

- Mato Grosso is twice the size (903,357 km²) of the US state of California (423,970 km²) and is one of the most important agricultural areas in South America and in the World
- In the 2013 agricultural year Mato Grosso's production is 23.5 million tons of soybeans (25% of Brazil's production), with 7.0 million hectares planted (Brazil, IBGE, 2013)
- 1º Soybean, 1º maize, 1º cotton, 2º beef cattle, poultry, hogs, ethanol
- Emerging industry, mainly in agribusiness
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Literature Review

Variable	Theoretical	Empirical	Source
Growth of municipal per capita income	Oliveira et all (2006)	Dassow (2010)	IBGE
per capita income in the base year	Solow (1956)	Maranduba Júnior (2007); Ribeiro (2010) and Oliveira et all (2011)	IBGE
Industry share	Myrdal (1965)	Maranduba Júnior e Almeida (2009)	IBGE
Agricultural share		Barro & Sala-i-Martin (1999), Dassow (2010)	IBGE
Services share		Barro & Sala-i-Martin (1999), Dassow (2010)	IBGE
Public sector share		Barro & Sala-i-Martin (1999), Dassow (2010)	IBGE
Human Capital	Lucas (1988)	Ribeiro (2010)	IBGE
Demographic Density	Fujita, Krugman & Venables (2002)	Maranduba Júnior & Almeida (2009)	IBGE
Budget Expenditures	Rocha & Giubert (2005)	Ribeiro (2010) and Oliveira et all (2011)	Tesouro nacional; SEFAZ/MT;

Literature Review

Variable	Theoretical	Empirical	Source
Credit	Schumpeter (1982)	Dassow (2010)	BACEN
Exports	Souza (2005)	Dassow (2010)	MDIC
Imports	Clemente & Higachi (2000)	Dassow (2010)	MDIC
Regional Market	Williamson (1998)	Maranduba Júnior & Almeida (2009)	IBGE
Taxes	Rebelo (1991)	Ribeiro (2010)	SEPLAN/MT
Intergovernmental transfers of ICMS (GST)	Myrdal (1965); Fujita et all (2002)	Maranduba Júnior & Almeida (2009)	Tesouro Nacional
Intergovernmental transfers of IPM (MPI)	Myrdal (1965); Fujita et all (2002)	Maranduba Júnior & Almeida (2009)	Tesouro Nacional

Method

- Exploratory Spatial Data Analysis (ESDA) of growth and GDP components;
- Econometric analysis of the effect of GST and MPF over GDP per capita growth;
 - Barro & Sala-i-Martin (2002): income convergence
 - $-\beta$ -convergence (absolute x conditional)

$$\frac{1}{T}\ln\left(\frac{Y_{0+T}}{Y_0}\right) = \alpha + \beta_1 \ln(Y_0) + \beta_2 X_{1,i} + \dots + \beta_9 X_{9,i} + \varepsilon_{0,T}$$



Method

- Least Squares (no spatial dependence)
- Correction for heteroskedasticity Newey-West
- Tests for classical assumptions of the linear regression model
- GINI for inequality in the intergovernmental transfers





Results

- in 2001: the richest municipality was 29 times the poorest one
- in 2010: 12 times
- 02 municipalities with annual growth rates above 15%: Bom Jesus do Araguaia = 16.02% and Alto Araguaia = 22.64%
- 07 municipalities with negative annual growth rates: Campos de Júlio = -1.34%; Juruena = -0.6%; Nova Olímpia = -2.09%; Santo Antônio do Leste = -4.1%; Santo Antônio do Leverger = -7.6%; Sapezal = -0.2%; Sorriso = -0.1%



Annual growth rates of the real GDP per capita: 2001 - 2010



Source: Research data. Note: real prices of 2010.







Source: Research data. Note: real prices of 2010.



Average MPF per capita transferred to municipalities: 2001 - 2010



Source: Research data. Note: real prices of 2010.



Moran Dispersion plot of the natural log of GDPpc: 2001: real prices of 2010



Source: Research data. Statistically significant at 1%.



LISA *clusters* of the municipal income per capita average growth, at 2010 prices





LISA *clusters* of the average GST per capita: 2001 - 2010, at 2010 prices





LISA *clusters* of the average MPF per capita: 2001 - 2010, at 2010 prices





Conditional Income	Convergence ir	n Mato Grosso,	2001-2010
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 $1 (Y_{0+T})$

$\frac{1}{T}\ln\left(\frac{-\alpha+1}{Y_0}\right) = \alpha + \frac{1}{T}$	$\beta_1 \ln(Y_0) + \beta_2 X_{1,i} + \dots + \beta_9 X_{9,i}$	$+ \varepsilon_{0,T}$
Explanatory Variables	Coefficient	P-value
α	0.4787	0.0000
lnYi,t-1	-0.0518	0.0000
Sind	0.1274	0.0000
Sagro	0.1081	0.0000
Sserv	0.0520	0.0000
Spub	-0.1365	0.0000
Н	0.0004	0.0010
Ticms	0.00005	0.0000
Tfpm	-0.0000007	0.1182
Impor	0.000003	0.0000
	0.8847	-
Breusch-Godfrey	0.4784*	0.8034
Jarque-Bera	3.6379*	0.1621
Hausman Test	0.1176*	0.9883
Lagrange Multiplier (error)	0.1290*	0.7194
Lagrange Multiplier (lag)	0.9322	0.3342

Source: Research data. Note: * – not significant at 10%. Legend: $Y_{i,t-1}$ – natural logarithm of municipal GDP per capita in 2001; Sind – composition of the municipal industry sector; Sagro – composition of the municipal agricultural sector; Sserv – composition of the municipal services sector; Spub – composition of the municipal public sector ; H – municipal human capital; Ticms – intergovernmental transfers of GST (ICMS) to the municipalities; Tfpm – intergovernmental transfers of the MPF to the municipality; e Impor – average of municipal imports per capita.

Discussion

- Budget expenditures, credit, exports, taxes and Gini were all not-significant to explain growth rates (and dropped out from the final model)
- The Municipal Participation Fund transfers was not significant
- The GST transfers coefficient was significant at 1%





Problems in actual criteria for GST distribution

- According to the 1988 Brazilian Constitution, at least 75% is distributed according to a Fiscal Added Value (FAV)
- Sales (2010) says that the FAV represents the largest weight in the MPI share = double benefit
 - Tax incentive Kandir Law
 - Larger production = larger FAV
- Most of the municipalities have small population



Proposal

Tabela 10 – Proposta metodológica para o repasse da cota-parte do ICMS e do FPM em Mato Grosso

Variáveis	Fonte Dados	Participação
População	IBGE	50%
Área	SEPLAN	1,5%
Coeficiente social	IDH/SEPLAN	11%
Unidade de conservação/território Indígena	SEMA	1,5%
Valor Adicionado Fiscal	SEFAZ	25%
Inverso do índice da renda per capita	STN	11%

Fonte: Adaptado pelo autor. Obs.: Informações das variações per capita da nova metodologia conforme Anexo A.1.







Results Proposal

- Gini actual: 0.25
- Gini proposal: 0.19
- 61 municipalities would benefit
- Reduce differences: rich x poor





Thank you

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