



Factors Related to Heterogeneity in Public Policy Output

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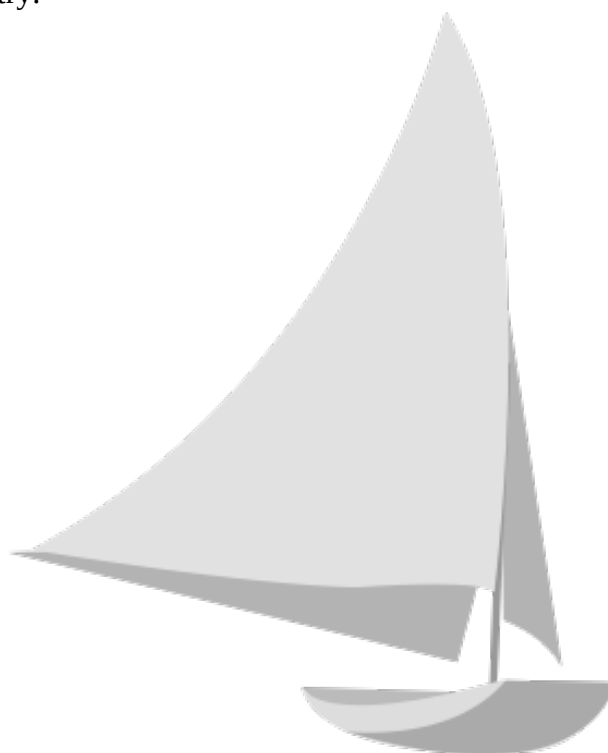
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Resumo

The institutional approach based in the North (1990) has the assumption the same institution would lead to homogenous results within countries. However, Menard (2017) argues there is an intermediary layer between the rules of the game (institutions) and the organizational level. This can lead to heterogenous output on the same rule. The purpose of this research is to investigate, under the intermediary institutions approach or meso institutions what are the factors related heterogeneity in the output of a same public policy. Empirically, the analysis is on the Brazilian school food procurement law. Cross section regressions were run. The results show that local context and intermediary institutions features are related to heterogenous output. This research contribution is to identify that, in addition to be a key factor for explaining inequalities between countries, institutions are also important to understand inequalities within the same country.





Factors Related to Heterogeneity in Public Policy Output

Summary

The institutional approach based in the North (1990) has the assumption the same institution would lead to homogenous results within countries. However, Menard (2017) argues there is an intermediary layer between the rules of the game (institutions) and the organizational level. This can lead to heterogenous output on the same rule. The purpose of this research is to investigate, under the intermediary institutions approach or meso institutions what are the factors related heterogeneity in the output of a same public policy. Empirically, the analysis is on the Brazilian school food procurement law. Cross section regressions were run. The results show that local context and intermediary institutions features are related to heterogenous output. This research contribution is to identify that, in addition to be a key factor for explaining inequalities between countries, institutions are also important to understand inequalities within the same country.

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1. Introduction

Strategic management ideas for private organizations are mainly concerned about how to create heterogeneity and achieve longstanding competitive advantage (Barney, 1986). However, when management is related to public policies, one of the most important interest is to create a common base for development and social welfare to happen.

Many researches regarding implementation and impact of public policies do not focus on how different consequences are achieved in adopting the same policy. They consider there is homogeneity between the results (Acemoglu, Johnson and Robinson, 2001, Rodrik et al. 2004).

New Institutional Economics also assume that all organizational types would respond the macro-institutions the same way. However, transaction costs can differ from one type to the other and this must be considered. These arise from the way agents create and select coordination mechanisms to implement a policy (Brousseau & Raynaud, 2006). Therefore, the conditions of implementation and enforcement of macro-institutions are fundamental for explaining how these rules work at the organizational level (Brousseau and Raynaud, 2006, Menard, 2018).

As macro-institutions like national public policies generally have wide reach, it is possible that the different environment where they are translated to the organizational level, deals with different available resources (technological, human and physical) and that would be the reason for output diversity. However, even when a macro-institution specifies and limits the resources and conditions to executing an activity, there is no guarantee there will be standardized interpretation or that incentives and punishments will be felt the same way by all organization required to do it.

If the diversity on policy outputs is not well explained by the context (characterized by the available resources), the answer can be related to institutions. This research argument is that heterogeneity of resources is an important factor for diversity output of the policies, possibly in a direct relationship. However, in the similar resource context, the established of intermediary institutions lead to trade-offs between cost and benefits and different results.



To test this idea, I analyze the Brazilian school food procurement, regulated by the law nº 11,947, from 2009. It states that at least 30% of total money passed on from the federal government to each municipality must be used to buy food from family farm producers¹. Every year, the federal government account for what percentage was bought from local agriculture, and the municipality that does not accomplish the minimum goal risks being penalized². The available data shows different achievements on this goal (PNAE, 2016), which is unpredictable considering that all regions are under the same regulation.

The purpose of the research is to investigate, under the intermediary institutions approach, what are the factors related heterogeneity in the output of a same public policy and what are its consequences.

To better understand this subject this general question is divided into two others:

- a) Why does the same rule lead to different results? Is it due to intermediary institutions?
- b) What is the effect of this public policy output on education?

This research question is empirically relevant for some reasons. This research question is empirically relevant for some reasons. The first is that “Family farmer agriculture is fundamental for Brazilian development. There approximately 4.4 million family farmers, which is 84% of all Brazilian farmers” (Brazilian Agriculture Ministry, 2018). And the analyzed law incentives public procurement specifically from this agriculture type.

The second reason is that this policy on focus has a national and comprehensive reach. In 2016, 5,570 municipalities and 154,060 schools participated on the analyzed program, which generated R\$ 3,421,487,528.00 in food procurement. My expected contribution is a clearer understanding on what factors can help the successful implementation of a public policy.

This research question is relevant for theory because while previous studies focused on the general effect of policies suggest that they are homogenous within nations, I can possibly find that the effect of these policies largely depend on intermediary institutions and what happens between a general rule and the organizational level. The incorporation of these additional factors would be crucial to improve the understanding why some public policies do not generate the expected outputs.

2. Theoretical Background and Hypotheses

The institutional approach based in the North (1990) argues that there is a direct interaction between general rules and the organizational level, leaving out the relationship between the intermediary institutions on this process. Indeed, some studies as Acemoglu and Robinson (2012) reinforce this approach, showing the influence of macro institutions in the countries development.

However, some experiences show that for the same public policy, there can be different output (Menard, 2017). The lens used to understand the interaction between a general

¹ According to the Brazilian law (nº 11,326), a farmer is considered a family farmer if he or she: does not hold, in any way, an area greater than 4 (four) fiscal modules; predominantly use the labor force of the family itself in the economic activities of its establishment or enterprise; have income predominantly originated from activities linked to the farm; direct his or hers establishment or enterprise with his or hers family.

² The penalization can be not to receive money on the next period or to have to give it back to the federal government.



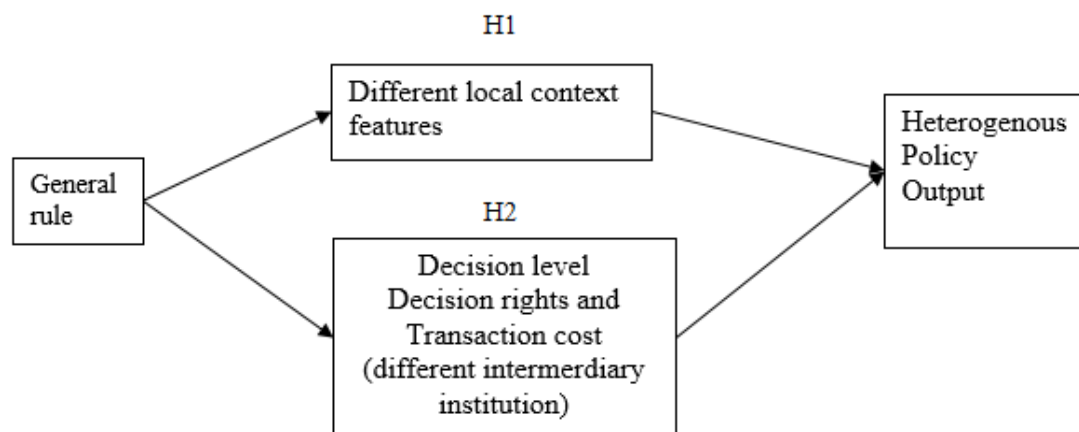
rule, that usually have a comprehensive reach, and the organizational level where transactions occur will be intermediary institutions.

According to Brousseau and Raynaud (2011), “Intermediary institutions emerge to address coordination problems at a lower cost than bilateral and generic devices.” (p.68). These intermediary institutions are especially important when the institutional change is done through a top-down approach in “which enlightened reformers seek to implement institutional change” (Brousseau, Garrouste, and Raynaud, 2011, p.13) and few specificities are described in the general rule about how to implement it. This seems to be the case of rule used on empirical data for this research.

The different percentages achievement on this policy can be due to different local context features. However, if in similar local context, there is heterogeneous policy output (different percentages), I argue it is due to intermediary institutions, that can be the school feeding council, contracts between diverse government levels and others. I also investigate if heterogeneous policy output leads to a heterogenous impact in a related policy.

The following figure shows how variables and hypothesis are related:

Figure 1: Hypotheses framework



Source: author

Hypothesis 1: Heterogeneous policy output to a same general rule are directly related to different geographic and socio-economic context (heterogeneity of resource)

Hypothesis 2: Heterogeneous output to a same general rule are directly related to different intermediary institutions.

In the municipalities, there is the school council. The school council representatives differ among municipalities and this would characterize contrasting intermediary institutions.

3. Methods

To identify the factors related to heterogenous result (hypothesis 1 and 2), I used a cross section regression and a Tobit model as there are many (940 observations out of 5481) zero observations. According to (Wooldridge, 2012), it is recommended to use Tobit when a dependent variable is a corner solution response.

This is the tested model for the population for the first two hypothesis:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$$



Where: β_0 is the constant parameter, β_1x_1 are the variables related to the school food council existence and characteristics, β_2x_2 and u emerges as the error term. β_1x_1 and β_2x_2 are specifically explained at data section.

4. Data and summary statistics

The following table relates the variable name, how it appears on Stata software, what is its type and if it is related to the context or to the intermediary institution.

Table 1: First and second hypothesis variables

Variable name	Variable name on Stata	Variable type	Related to hypothesis
family farm producers acquisition	Percentual~r	Metric (left and right limited)	Dependent variable
education improvement	Melhorad~r	Dummy	Local context features
school food council existence	Conselhode~r	Dummy	Intermediary institutions
school food council creation year	AnodeleideE	Metric	Intermediary institutions
school food council has advisory characteristic	CaráterCons~o	Dummy	Intermediary institutions
school food council has deliberative characteristic	CaráterDeli~o	Dummy	Intermediary institutions
school food council has normative characteristic	CaráteNorm~o	Dummy	Intermediary institutions
school food council has supervisory characteristic	CaráterFisc~r	Dummy	Intermediary institutions
How many meetings were held in the past 2 months	Quantidade~m	Metric	Intermediary institutions
specific money destination to education law	Leiorgânica~l	Dummy	Local context features
whose responsibility education management is under: mayor, education department, other	Agestãoodosr~a	Transformed to dummy	Local context features
There is a parent and teacher representative among school council members	Represent~os	Dummy	Intermediary institutions
There is a local parliament representative among school council members	Represent~a	Dummy	Intermediary institutions
There is a school director representative among school council members	Rep~toresdas	Dummy	Intermediary institutions
There is a school employee representative among school council members	Rep~doresdas	Dummy	Intermediary institutions
There is a tutelary council representative among school council members	Represent~r	Dummy	Intermediary institutions



There is a private school representative among school council members	Represent~d	Dummy	Intermediary institutions
There is a university representative among school council members	Represent~e	Dummy	Intermediary institutions
There is a union representative among school council members	Represent~c	Dummy	Intermediary institutions
There is another representative among school council members	outros	Dummy	Intermediary institutions
Family farms units/ total farms percentage	estabeleci~i	Metric variable (left and right limited)	Local context features
family farms yield / total farms yield percentage	prodagri~r	Metric variable (left and right limited)	Local context features
GDP/capita	PIBCapita~2015	Metric	Local context features
tax collection/capita	Impostos~2015	Metric	Local context features
geographic area/capita	readomunic~a	Metric	Local context features
rural population / total population percentage	poprural	Metric variable (left and right limited)	Local context features
school nutritionist quantity	qntdenu~2015	Metric	Local context features
school nutritionist quantity/school	nutricioni~a	Metric	Local context features
school units quantity	escolas~2016	Metric	Local context features
student's quantity	alunosa~2016	Metric	Local context features
money passed from federal government total	Recursos~2016	Metric	Local context features
school council is paritary	caeparitario	Dummy	Intermediary institutions

Source: author

Local context variables data were collected from Geographic and Statistics Brazilian (IBGE) diverse researches, intermediary institutions variables data were collected from IBGE Munic Research 2014 issue and dependent variable data as well as school, students and nutritionist's information were collected School Development National Fund (FNDE).

On the following figure we can see the variables summary:

Figure 2: First and second hypothesis variables summary



Variable	Obs	Mean	Std. Dev.	Min	Max
codmun	5570	3253591	984910.3	1100015	5300108
Município	0				
Percentual~r	5481	.2702913	.211488	0	.9999859
Melhoria~r	5548	.944845	.2283032	0	1
Conselhode~r	5566	.9761049	.152736	0	1
Anodaleide~E	5359	2001.851	5.596493	1947	2014
OConselhop~o	0				
CarterCons~o	5432	.6520619	.4763601	0	1
CarterDeli~o	5432	.7227541	.4476802	0	1
CarterNorm~o	5432	.3814433	.4857857	0	1
CarterFisc~r	5432	.8882548	.3150817	0	1
Quantidade~m	5397	6.692607	4.844832	0	120
Leiorgnica~l	5566	.8379447	.3685347	0	1
Agestodosr~a	0				
Represent~os	4874	.9173164	.2754317	0	1
Representa~a	4874	.398851	.4897123	0	1
Rep~toresdas	4874	.7870332	.4094464	0	1
Rep~doresdas	4874	.9013131	.2982718	0	1
Representa~r	4874	.5478047	.4977605	0	1
Representa~d	4874	.3249897	.4684191	0	1
Representa~e	4874	.1551087	.3620455	0	1
Representa~c	4874	.4647107	.4988043	0	1
outros	4874	.4372179	.4960936	0	1
estabeleci~i	5548	.7846036	.1553441	0	1
produoagri~r	5421	.6261845	.3180026	0	1
PIBCapi~2015	5565	20726.76	21606.46	3580.692	562636.7
Imposto~2015	5565	1689.341	3284.674	71.58568	70447.19
readomunic~a	5565	.1123571	.2969119	.0000768	7.620421
poprural	5565	.361736	.2204113	0	.9582115
qntdenu~2015	5570	1.554399	3.140112	0	176
nutricioni~a	5562	.1346867	.1636313	0	2
escolas~2016	5570	27.65224	73.90843	0	4063
alunosa~2016	5570	7241.77	35036.87	0	2051750
Recurso~2016	5570	614188.4	4747978	0	2.21e+08
caeparitario	5432	.9096097	.2867665	0	1
gestrecres~c	5507	.4933721	.5000015	0	1
gestrecres~f	5507	.3524605	.4777798	0	1
gestrecres~t	5507	.1541674	.361142	0	1

Source: author, from Stata software

It is interesting to note that family farm producers acquisition percentage's mean is 0.27, which is lower than the required by law percentage. This data is from 2015, when the policy was already six years old, which is an indication of design or implementation law problem.

5. Result Analysis



For the regression with winsorized distribution and robust error correction, this is the output:

Figure 3: First and second hypothesis regression output

Percentualaquisiesagricultur_w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Melhoriaadaalimentaoescolar_w	.0265417	.0124525	2.13	0.033	.0021286 .0509549
Conselhodealimentaoescolar_w	0 (omitted)				
AnodaleidecriaodoCAE_w	.0002686	.0005443	0.49	0.622	-.0007985 .0013358
CarterConsultivo_w	-.00711	.007071	-1.01	0.315	-.0209726 .0067526
CarterDeliberativo_w	-.0053291	.0071412	-0.75	0.456	-.0193294 .0086712
CarterNormativo_w	-.0063507	.0069314	-0.92	0.360	-.0199398 .0072384
CarterFiscalizador_w	-.0035331	.0092369	-0.38	0.702	-.021642 .0145758
Quantidadedereuniesnosltim_w	.0002096	.0008174	0.26	0.798	-.0013928 .0018121
Leiorgnicadefineopercentual_w	.0073901	.0085401	0.87	0.387	-.0093528 .024133
Representantedepaisealunos_w	-.0122171	.0109874	-1.11	0.266	-.0337579 .0093237
RepresentantedaCmaraMunicipa_w	-.0210573	.0062618	-3.36	0.001	-.0333335 -.0087811
Representantedosdiretoresdas_w	.0072468	.007765	0.93	0.351	-.0079766 .0224702
Representantedosservidoresdas_w	-.0080815	.0105322	-0.77	0.443	-.0287299 .012567
RepresentantedoConselhodeDir_w	-.014917	.0064142	-2.33	0.020	-.027492 -.002342
Representantedasescolasdared_w	.0069234	.0071994	0.96	0.336	-.007191 .0210378
Representantedeinstituiode_w	.0258001	.0091225	2.83	0.005	.0079153 .0436848
Representantedesindicatoassoc_w	-.0185739	.0063839	-2.91	0.004	-.0310896 -.0060583
outros_w	.0220698	.0062196	3.55	0.000	.0098763 .0342632
estabelecimentosruraisfamili_w	.1868008	.0250887	7.45	0.000	.1376143 .2359872
produoagriculturafamiliar_w	.0405781	.0093754	4.33	0.000	.0221975 .0589586
PIBCapita2015_w	2.41e-06	3.94e-07	6.11	0.000	1.63e-06 3.18e-06
Impostoscapita2015_w	-2.91e-06	2.98e-06	-0.98	0.330	-8.75e-06 2.94e-06
readomunicipioemkmcapita_w	-.180925	.0182913	-9.89	0.000	-.2167852 -.1450648
poprural_w	.0489114	.0190622	2.57	0.010	.0115399 .0862829
qntdenutricionistas2015_w	.0008419	.0037589	0.22	0.823	-.0065274 .0082113
nutricionistasescola_w	.047734	.029549	1.62	0.106	-.0101969 .1056649
escolasatendidas2016_w	-.0001526	.000199	-0.77	0.443	-.0005428 .0002376
alunosatendidos2016_w	1.59e-06	9.23e-07	1.72	0.085	-2.21e-07 3.40e-06
Recursosrepassados2016_w	-3.75e-08	1.27e-08	-2.95	0.003	-6.23e-08 -1.26e-08
caeparitario_w	.0051382	.0104511	0.49	0.623	-.0153512 .0256277
gestrecresorggestedc_w	.0334318	.0068492	4.88	0.000	.0200039 .0468596
gestrecresgabpref_w	0 (omitted)				
gestrecresout_w	.00309	.0091473	0.34	0.736	-.0148433 .0210234
_cons	-.4930785	1.090839	-0.45	0.651	-2.631671 1.645514

Source: author, from Stata

From hypothesis 1, seven variables were significative. As expected by theory the more available resources such as family farms units/total farms percentage, family farms yield/total farms yield percentage, GDP/capita, rural population/total population percentage were positively related to more Family farms procurement percentage. Also, as expected, geographic area/capita is negatively related to dependent variable, which possible indicates that transportation is an important process that disturbs the procurement process. The fact that this police management is under the education department can be seen possibly as a model to be followed. This result confirms hypothesis 1.

However, the money passed from federal government total variable is surprisingly negatively related to the dependent variable. This amount is fixed on the students that attend school quantity for the municipality. Maybe, this amount is enough for some cities and insufficient for others. This requires further investigation.

For the hypothesis 2, five variables were significative. The presence of a parliament member among school food council members is negatively related to the dependent variable. A possible explanation is that these members are not interested in promoting



family agriculture, they would be more aligned with the agribusiness sector as is in the Brazilian national parliament. The presence of a university representative is positively related to the dependent variable, this can be due to school, education or nutrition researchers who study the food procurement and indirectly incentive family farm procurement.

The “another” variables means that there some school council members that are not anticipated as members by the law and are not the traditional stakeholders. It is positively related to the family farm procurement percentage. This is probably due to an important stakeholder that was not considered by the Munic research, where this data is from, or the fact that if the school food council is seen as an important organization by the local population more people want to voluntarily participate on it.

Tutulary council and union representatives are both negatively related to family farmers procurement and are counter intuitive output that require more investigation. It would be interesting to know exactly what kind of workers the union represent, it is possible that they stand for a family farmer competitor. These results confirm hypothesis 3.

The following table shows the Tobit model output:

Figure 4: First and second hypothesis Tobit model output

Percentualaquisiesagricultur_w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Melhoriadaalimentaoescolar_w	.0367969	.015907	2.31	0.021	.0056111	.0679826
Conselhodealimentaoescolar_w	0 (omitted)					
AnodaleidecriaodoCAE_w	.0002782	.0006488	0.43	0.668	-.0009938	.0015502
CarterConsultivo_w	-.0082359	.0080939	-1.02	0.309	-.024104	.0076321
CarterDeliberativo_w	-.0067544	.00821	-0.82	0.411	-.0228501	.0093412
CarterNormativo_w	-.0061372	.0080849	-0.76	0.448	-.0219876	.0097132
CarterFiscalizador_w	-.0049245	.0112025	-0.44	0.660	-.026887	.0170381
Quantidadedereuniesnosltim_w	.0006151	.0009695	0.63	0.526	-.0012856	.0025157
Leiorgnicadefineopercentual_w	.0117514	.0097707	1.20	0.229	-.007404	.0309068
Representantedepaisealunos_w	-.015276	.0129085	-1.18	0.237	-.0405832	.0100311
RepresentantedaCmaraMunicipa_w	-.0228084	.0072914	-3.13	0.002	-.0371032	-.0085136
Representantedosdiretoresdas_w	.0094603	.0089522	1.06	0.291	-.0080906	.0270112
Representantedosservidoresdas_w	-.0059408	.0121011	-0.49	0.623	-.0296651	.0177835
RepresentantedoConselhodeDir_w	-.0195999	.0074087	-2.65	0.008	-.0341246	-.0050752
Representantedasescolasdared_w	.0089435	.0086603	1.03	0.302	-.008035	.025922
Representantedeinstituioede_w	.0290558	.0106875	2.72	0.007	.0081029	.0500087
Representantedesindicatoassoc_w	-.0179322	.0074162	-2.42	0.016	-.0324717	-.0033927
outros_w	.0247726	.0072658	3.41	0.001	.0105281	.0390172
estabelecimentosruraisfamili_w	.2199	.0288929	7.61	0.000	.1632554	.2765447
produoagriculturafamiliar_w	.0462156	.0110169	4.19	0.000	.024617	.0678143
PIBCapita2015_w	2.66e-06	3.92e-07	6.78	0.000	1.89e-06	3.43e-06
Impostoscapita2015_w	-3.29e-06	3.10e-06	-1.06	0.289	-9.38e-06	2.79e-06
readomunicpioemkmcapita_w	-.2412909	.0227852	-10.59	0.000	-.2859614	-.1966204
poprural_w	.053996	.0216683	2.49	0.013	.0115152	.0964768
poprural_w	0 (omitted)					
nutricionistasescola_w	.0392071	.0271183	1.45	0.148	-.0139584	.0923727
escolasatendidas2016_w	-.000147	.0002778	-0.53	0.597	-.0006915	.0003976
alunosatendidos2016_w	1.36e-06	1.19e-06	1.14	0.255	-9.77e-07	3.69e-06
Recursosrepassados2016_w	-3.30e-08	1.63e-08	-2.02	0.043	-6.51e-08	-9.77e-10
caeparitario_w	.0072956	.0121491	0.60	0.548	-.0165227	.0311139
gestrecresgabpref_w	-.0401043	.0079338	-5.05	0.000	-.0556585	-.0245501
gestrecresout_w	-.035259	.0101376	-3.48	0.001	-.0551338	-.0153841
gestrecresorggestedc_w	0 (omitted)					
_cons	-.5387253	1.298648	-0.41	0.678	-3.084728	2.007277

Source: author, from Stata

There are some small differences in significance and coefficients between this model and the regression. This is probably a more adequate model for the used data base. All analyses for the last regression can be applied here.



In this model, whose responsibility education management is under is shown differently from the previous model, but they mean the same: significantly, it is more successful to go for the education department approach.

6. Conclusion

I provide evidence that local context and resources, that are well known from management theory is only part of the explanation for why a same general rule would lead to different results. Therefore, hypothesis 1 was confirmed, but also hypothesis 2: intermediary institutions also play a role in explaining these differences. Which is an indication that general institutions and organizations do not interact always in a direct manner.

Some limitations of this work are the many significative variables with a counter intuitive sign, which requires further investigation. As research suggestion there is a cluster analysis to use similar context municipalities cluster observations and compare them using only intermediary institutions as independent variables instead of municipalities as observations. In addition, I recommend a qualitative approach to deep understand the intermediary institutions characteristics and variations among them.

This research empirical contribution is some initial suggestions of what factors are fundamental to achieve more family farm procurement. For theory the contribution is the inquiry of whether the institution theory that regard them as homogenous within countries is complete or with more layers would be more adequate to better understand reality.

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