

# **A Fiscal Need Approach to sub national Fiscal Equalization. An Application for the case of Chile<sup>1</sup>**

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## **ABSTRACT**

This research is intended to measure the gap between the existing level of grants to municipalities on account of school level education, primary health services and other services, relative to a theoretically advisable expenditure level per beneficiary based on the so called “Fiscal Need Approach to Equalization” as developed by Shah (1996, 2007). Since the early 80s, Chilean municipalities administer both school level public education as well as primary health centers, on account of which the central government grants municipalities with a transfer per beneficiary. Direct observation of the data suggests that significant differences exist in the funding per head at these functions. Our main finding hinges upon the fact that an estimated deficit (surplus) per regional government –this being the result of summing up municipal level estimated outputs, does not support the hypothesis that Chile is a fiscally “centralized” country.

*Keywords: intergovernmental transfers.*

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## I. Introduction.

“Decentralization” has at least four alternative meanings. One is political decentralization, which entails the devolution of political rights onto sub national governments. The second one is “administrative decentralization”, very often called “de-concentration”, whereby centrally controlled services are reallocated across the national territory. A third definition is the economic one, and it refers to the national distribution of the economic activity. Finally, there is the well-known “fiscal decentralization” (FD), which reflects the extent to which general government’s expenditures (tax revenues), are evenly distributed across jurisdictions. This present paper hinges upon the expenditure side of FD, as it intends to measure the potential improvement in the existing allocation of grants to municipal governments in order to achieve a “fiscal need” allocation to sub national equalization. As opposed to the common view of Latin American countries as extreme cases of “centralization”, we hypothesize that efforts to equalize expenditures in Chile go even beyond the point of optimum fiscal equalization. This contention is taken to test by using the so-called “Fiscal Need Approach to Equalization” as developed by Shah (1996, 2007). On the one hand, our results confirm this hypothesis. On the other, the empirical exercise being presented shows how difficult it is in practice, a thorough implementation of a purely need based approach.

Revenue based fiscal decentralization (FD) may be deepened upon two alternative measurements. One is giving sub national governments more taxing power. However common in federal countries, tax autonomy is rather exceptional in unitary ones. A second option, quite popular in unitary as well as federal countries alike, is the allocation of grants to sub national governments. While they admit a myriad of different targets (Letelier 2012), a key aspect of their design hinges upon the mechanism to allocate them across jurisdictions. Broadly speaking, it can be stated that once a political decision has been taken on the primary distribution of the budget across tiers of governments, the distribution of grants can be made on the basis of a rule or alternatively; in a discretionary way. Upon the assumption that discretionary fiscal decisions entail the danger of political opportunism by the donor government, the relevant challenge consists in how a sound rules-based system of grants assignments is to be designed. The use of a rule admits a wide variety of alternative models, which range from the sole definition of entitlement’s shares across jurisdictions – even regardless of the socio economic indicators of benefited jurisdictions, to the case of very comprehensive need oriented models.

In the Chilean case, local governments are running public services in the areas of school level education and primary health care since the beginning of the 80s. Albeit most of the funding comes from the central government (see next section), municipal governments made contributions to funding these functions out their own local revenues. Central government’s grants assignments are based on the number of beneficiaries per municipality, plus a number of special programs intended to target specific local needs. They are particularly relevant from both the fiscal and the political perspective, as the new current national government has promised to

provide “quality public education” across the country, which involves – among other factors, the return of existing “Municipal Schools” to some kind of centrally run type of jurisdiction whose funding is still to be defined. Some small grants are assigned on account of municipal services other than education and health. While municipalities are also in charge of various other functions, most spending in this case comes from the municipal revenues themselves.

The remaining of this paper is organized as follows. Section II describes the existing debate and the international experience grants allocation. Section III explains the funding system of education and health in Chile. Section IV presents the Fiscal Need Approach to Equalization. Section V summarizes the estimation procedure and section VI shows the results.

## **II. The existing debate and the international experience.**

The theoretical justification of intergovernmental grants has been extensively documented in the literature. Efficiency considerations call for compensation grants in dealing with inter jurisdictional externalities, the need to ensure a national standard as far as the provision of public goods is concerned, the role of sub national governments as “agents” of the national one, and the need to guarantee an acceptable degree of equity in the provision of public services, are among the best known arguments (Letelier 2012). Nevertheless, the actual design of the intergovernmental fiscal relations system entails numerous theoretical and empirical challenges. First, there should be a political definition as regards the target being pursued by intergovernmental grants. If they are intended to achieve some kind of fiscal equalization across jurisdictions, there is still the question as to what exactly that equalization means. At one end this might be a “full equalization”. At the other, this may only target a “minimum standard” as stated above. Second, fiscal policy tools being used to pursue the target so defined are potentially quite diverse. As long as local needs are to be captured in some kind of allocation rule, the question remains as to how those needs are turned into a representative type of expenditure across jurisdictions. A precise local need measurement may require information that is not easily available or even unobservable for the policy maker. The problem of just focusing on “tax (revenue) equalization” is that it would make jurisdictions to be only partially responsible for the expenditures they make as long as the specific costs of local services are much larger than revenues (Musgrave 1959). As Shah (1996) correctly points out, only an equalization scheme that considers both the differential revenues would be appropriate. One obvious difficulty though, is the fact that “needs” are more difficult to measure than fiscal capacity. An active debate exists regarding type of indicators to be included in the grants’ distributing formula (Smith 2012). A very important feature to consider is that need indicators should be exogenous to the granted jurisdictions. Otherwise, they are likely to behave in such a way as to maximize the grants being received by controlling the value of indicators themselves. Either way, the optimum need approach to equalization must consider a basic “capitation assignment” timed by an adjustment factor which accounts for local environmental conditions.

The international experience shows that rule-based allocation schemes admit a myriad of policy options. They range from strict co participation of specific taxes - as it is the case in Italy (Palermo

y Wilson 2013) and Brasil (Ter-Minassian 2012), to the establishment of a Law whereby subnational government contribute to a fund which is then allocated according a formula, this being closer to the case of the so called “co participation” share of provincial grants in Argentina (Rezk et. al. 2011). In the absence of a strict tax sharing arrangement, an ideal rule is meant to capture some political target on the matter, this being either the equalization of the original geographical distribution of national tax revenues (tax standard assessment), or the procurement of a guaranteed standard level of public services across the country (expenditure standard assessment). Some federations make that policy target explicit in their constitution, as it is for example the Canadian case (Clemens and Veldhius 2013). Nevertheless, only Australia is acknowledged to have a fully integrated tax-expenditure equalization model (Le Goff 2005). Albeit unitary nations are assumed to take that for granted, they widely differ in the stress being put on fiscal equalization. At one end, Great Britain possesses a sophisticated and comprehensive equalization system across local governments (Smith 2012). On the other, rather unequal and difficult to change systems exist in the cases of Peru and Chile for both Regional and municipal governments (Letelier y Neyra 2012, Letelier y Ormeño 2012).

Thus, regardless of the allocation system in place, the suitable way to assess the existing distributing mechanism is the establishment of a “standard” which reproduces the best possible equalization of revenues and/or the targeting of jurisdiction’s expenditure-needs. Nevertheless, this requires well up to date socio demographic information, which is very often not available. This present research addresses this in the context of the so called “Fiscal Need Approach to Equalization” of grants proposed by Shah (1996, 2007). As opposed to previous research on the subject matter (Letelier & Suarez 2014) in which investment needs were examined, this study focuses on grants intended to attend current municipal expenditures in Chile on the specific areas of education and health. As they originate on a capitation system that covers basic needs, plus a number of special “programs” being singled out in the national government’s budget, they are geared to support municipal governments in their “agent” role to provide a national standard of primary health and school level education services.

### **III. The Chilean Funding of municipal agent functions in Chile.**

Generally, municipal governments are given two types of grants in Chile. One is geared to funding local investment projects on the basis of competitive funds made available by the central government (Letelier and Pandeillo 2014). Although different deconcentrated public branches may apply, in most cases it is the municipal government itself the one that designs and sponsors the project, which is then entered into the so called “National Investment System”. Among technically approved projects according to the social evaluation method, the Regional Council is assumed to decide the execution of those that best fit regional government’s priorities. While the whole procedure is subject to an important technical filter, some evidence suggests that the distribution of money by the Regional Council is often contaminated with political considerations (Rubio 2014).

In a second group of grants we find central government’s financial support to current expenditures on a myriad of specific initiatives, of which this study focuses on education, health and other

services. Since the early 80s, Chilean municipal governments are in charge of running public schools and primary health centers. Although they receive a “capitation” grant on account of pupils attending to classes and potential local beneficiaries of primary public health care (Letelier and Ormeño 2013), complementary funding is provided through various special programs intended to address idiosyncratic features of municipal needs. Between 2001 and 2012, at least six separate branches of the national government have been involved in providing complementary funding to public (municipal) education. More than 60 specific programs were granted, which includes -among others, the support of kindergartens, the so-called full-time school attendance regime, scholarships to students in need, special assistance to indigenous groups, teachers training and the like. A similar situation can be observed in primary health, where no less than 10 specific programs may be identified in the same period. A third component of municipal service funding is the contribution made by municipal governments themselves, which is very unequally distributed across jurisdictions as a result of them having very diverse capacities to generate revenues of their own.

While the Chilean institutional framework does not explicitly defines a standard as regards the type of equalization being targeted through above grants, both the national Constitution as all as most related Laws are inspired on the general principle that all residents of the national territory should be given enough support from the center as to take all citizens to some kind of national standard. More specifically, Article 19 of the Constitution establishes that the State’s action “should be geared to guarantee *uniform basic benefits* (to all citizens), either they are provided through public or private institutions”. Thus, a follow-up question to be asked is how close we are from such a uniform standard, and/or how much effort should be made in achieving a higher degree of equalization. Unavoidably though, different answers can be given depending on two closely related issues. They are; i) the standard being chosen and ii) the range of variables being subject to that standard. In the same way as health services entail an ample range of specific benefits, so does school level public education. In this last case, feasible standards go from the number of students per teacher, to the average municipal level score in some national tests being taken by all pupils across jurisdictions. In dealing with above questions we follow Shah (1996, 2007) in the context of the so called “Fiscal Need Approach to Equalization” (FNE).

#### **IV. The FNE in Education, Health and other services.**

Following Shah (1996, 2007), the FNE consists in closing the gap between jurisdictions’ needs -they being defined according to some kind of national standard, and the real (feasible) level of expenditure being available from the existing jurisdiction’s revenues. The specification shown below (Eq.1) defines  $EE$  as the grant to be assigned to municipality “ $m$ ” on account of function “ $i$ ”. This depends on the difference between the per capita “standardized expenditure”;  $(PCSE)_m^i$ , which stands for the estimated expenditure made by  $m$  “to meet actual needs if it had national average policy capacity” Shah (1996), and the national average ( $NA$ ) of that expenditure across all jurisdictions;  $(PCSE)_{NA}^i$ . As we time this by the population in  $m$  ( $POP$ ), we get the whole grant to be assigned.

$$EE_m^i = (POP)_m [(PCSE)_m^i - (PCSE)_{NA}^i] \quad Eq. 1$$

The procedure being proposed to estimate Eq.1 follows four steps proposed by Shah (1996). *First*, we should estimate a regression, in which the endogenous variable is the expenditure made by each jurisdiction by each function being examined (education, health and others). Explanatory variables should capture the specific needs, jurisdiction specific costs and available resources of each jurisdiction. *Second*, by using estimated regression's coefficients obtained from step 1 plus the national average of financial capacity across all municipal governments, but keeping the value of needs for each separate jurisdiction, we estimate a predicted level of *SEPC*, which stands for our  $(SEPC)_{NA}^i$  in Eq.1. As all other variables in Eq.1 are easily observable, we may get an estimated value of *EE*.

Since the national averages are used in the procedure above are assumed to stand for both municipalities' financial capacity as well other factors beyond the municipal control, the same exercise can be repeated for different degrees of municipal equalization. Three alternative scenarios are examined. The first one will be called "Full Equalization", thereby the Shah's procedure is applied on all sources of revenues which include i) Property taxes, ii) Business Licenses, iii) Car Licenses and iv) other. A second scenario is the "Intermediate Equalization", in which only Property taxes and Business Licenses are considered. Finally, a "Low Equalization Scenario" is presented, in which only property tax is considered.

### III. Estimation Procedure.

#### *The Empirical Model.*

The three functions being considered amount to a three equation model. As expenditures per head across municipalities are likely to be correlated between types of government's expenditures, an efficient approach consists in estimating our set of regressions as a seemingly unrelated system (Zellner 1962). The system is as follows:

$$EXP_{it}^j = F^j(FISCAP, COSTS, NEEDS^j) + \mu_{it}^j \quad Eq. 2$$

Where  $EXP_{it}^j$  is the expenditure per beneficiary being made in year "t" by municipality "i" in function "j". Separate functions being examined are school level education, primary health and a set called others, in which remaining municipal functions fall into. As for fiscal capacity (*FISCAP*), this is made of two components. One is the so called "Own Income", which is the sum of local tax revenues, business and car licenses, garbage collection and other charges, and the municipal participation in the distribution of the Common Municipal Fund, which redistributes municipal revenues across the territory (Letelier 2006). Strictly speaking, this is part of regular municipal revenues since its distribution obeys to a rigid law-established formula. Despite some minor

contributions from the national government, the bulk of this fund is made up of tax being charged on all municipalities' property taxes revenues, plus a special tax paid by the four top richest municipalities on account of their local business taxes. The second FISCAP's component is the transfer being made by the corresponding ministry to funding the service at stake. In the cases of education and health, this stands for the sum of a formula grant per beneficiary, plus an additional contribution that accounts for a myriad of function-specific in cash grants.

As far as the cost variable is concerned, this is meant to capture cost-specific features at the municipal level. Despite Chile does not have a municipal level cost (price) index which may be used for that purpose, it will be assumed that some geographic local characteristics are mainly responsible for the potential cost differences across jurisdictions. First, regions far apart from the Capital in which specific conditions impede a fluid ground displacement, are also likely to have higher costs of public service delivery. As for Chile, this is certainly the case of Aisén in which 91.492 inhabitants live in an area of 106,990.9 km<sup>2</sup>. Although a number of relatively large cities exist in its territory, travel conditions are expensive as inhabitants mainly depend on plain or boat trips. Similarly, the cases of the Metropolitan Region and Araucanía deserve separate mention. In the first case, historical and political factors are alleged to bias public funds in its favor. Concerning the Araucanía region, this is the poorest region of the country and it is the focus of an increasing ethnic conflict between local ethnic minorities (pueblos *mapuches*) and the national government. A second cost factor is the distance between the jurisdiction at stake and the regional capital city, as very often professional staff which attends municipal services live in that capital but works in the particular locality we are looking at. A third cost variable is the percentage of the population which lives in rural conditions. In most cases, this involves less access to transportation, electricity and communication facilities, all of which makes it more difficult to provide a standardized level of municipal services. Fourth, population itself as well as population density may affect the extent to which competition across local providers is deep enough to provide low cost human and physical inputs to municipalities. In this regard, we may expect that density should affect expenditures per head negatively.

Concerning municipal needs, this admits a wide variety of alternative measurements. As stated above though, care should be taken in choosing indicators of needs which are exogenous to the municipal government. Despite most measurements of local education and health are indeed affected by municipal actions themselves, some of them are more the result of socio economic characteristics of each jurisdictions, which are only affected in the long run. In this regard, we consider the number of inhabitants as relevant factors in all three functions. Function specific factors include the share of health beneficiaries above 60, the percentage of green areas in the jurisdiction's territory and the poverty rate in the cases of education and other services. This last variable was omitted from the health regression as no clear cut reason exists to spend more as the share of poor population rises. Conversely, in the case of education, the local poverty rate demands additional efforts by the national as well as from the local level. Similarly, municipalities with a higher poverty rate are also more likely to spend more in attending social related demands other than education and health as shelter for the poor, job placement support and the like.

### *The data*

The data being used in the estimations is summarized in tables 1A and 1B. As for aggregate expenditure, table 1A reports annual data for both the municipal expenditures as a whole, as well as on the grants being assigned on account the three areas under analysis. Albeit grants represent about 80% of all expenditures in the cases of education and health, it is less than 1% on other services. In this regard, the “agent” nature of municipal governments in running schools and primary health centers entails a major fiscal responsibility by the national government. Data being used in estimating *Eq. 2* is presented in table 1B. Variable “*Education*” is expressed in municipal expenditure per registered pupil, “*Health*” is the municipal expenditure per registered beneficiary and “*Others*” is the expenditure made on other expenditures divided by the local population. It may be observed that most expenditure and fiscal capacity indicators are over dispersed ( $CV > 1$ ), which confirms the existence of great variations in the level of expenditure per beneficiary across municipal jurisdictions. This variation is mainly due to the contribution made by municipalities themselves to the funding of specific functions (namely education and health), the generally uneven capacity to support other areas of expenditure at the local level. As expected, this variation is lower when it comes to grants per beneficiary, which are assigned according to a formula that contains a built in equalization mechanism. The data summary shows that out the whole expenditure per beneficiary in education (US\$ 2,831.7), an average of US\$ 676 (23.8%) are provided by the municipal level on a voluntary bases. The same figure for health amounts to 26.8%, and more than 70% in other services. Given the high dispersion of municipal revenues ( $CV = 1.553$ ), this entails great variations in the quality of basic services being provided.

**Table 1A Data Summary (2012)**  
**Thousand US dollars**

	<i>Expenditure</i>			<i>Grants</i>		
	<i>Education</i>	<i>Health</i>	<i>Others</i>	<i>Education</i>	<i>Health</i>	<i>Others</i>
2008	2,694,436	948,701	3,477,129	2,171,664	747,042	22,528
2009	2,819,847	1,110,735	3,575,695	2,285,630	872,033	9,181
2010	2,992,034	1,245,790	3,763,579	2,359,111	976,977	14,346
2011	3,151,991	1,346,526	3,949,089	2,417,443	1,103,399	14,545
2012	3,371,960	1,494,104	4,386,419	2,626,741	1,214,134	67,422

Source: Under Secretariat of Regional Development



**Table 1B: Data Summary (2012)**

	<i>Mean</i>	<i>Std. Dev.</i>	<i>Coefficient of Variation (CV)</i>
<b><i>Expenditure<sup>a</sup> (US dollars)</i></b>			
<i>Education</i>	2,831.7	2,954.6	1.043
<i>Health</i>	144.2	159.9	1.109
<i>Others</i>	474.8	663.2	1.397
<b><i>Fiscal Capacity<sup>a</sup> (US dollars)</i></b>			
<i>mun reven</i>	374.8	582.1	1.553
<i>Grants (Educ)</i>	2,155.2	1,778.2	0.825
<i>Grants (Health)</i>	105.5	35.9	0.340
<i>Grants (Others)</i>	16.6	198.4	11.952
<b><i>Cost Indicators</i></b>			
<i>dens</i>	779.8	2,330.1	2.90
<i>dis.cap.reg</i>	128.3	228.3	1.78
<i>Green Areas</i>	4.41	6.5	1.47
<i>rural</i>	37.51	30.1	0.80
<b><i>Need Indicators</i></b>			
<i>population</i>	50,442.1	89,081.2	1.77
<i>Pop60</i>	0.119	0.030	0.25
<i>Poor</i>	17.0	8.0	0.47

a: Values per Beneficiary in US\$ dollars.

#### *Estimated Model.*

Results from the SUR model are presented in table 2. Definition and sources for specific variables can be seen in the APPENDIX. We first corroborate that fiscal capacity variables (*mun.reven* and *grants*) are significant and correctly signed. It should be observed though that the coefficient of *grants* is close to 0.5 in education and health and only 0.01 in other services. As data is in logs of values per beneficiary, this implies that a 1% raise in the value of grants per head leads less than 1% raise in expenditure in all three functions. This may be explained by two reasons. On the one hand, there is a share of expenditure which is made out of municipal's own revenues (see above). On the other, there is the chance that some of the increase on grants may lead to decline of municipal's own fiscal effort.

Regarding cost variables (*dens, rural, dis.cap.reg*), they suggest that densely populated areas are related with a lower expenditure per beneficiary, which is in line with the expected effect. This effect appears to be stronger for education and other services relative to education. Similarly, rural communities as well as the distance with the regional capital enhance local expenditure per head. Interestingly enough, when comparing the coefficients of *dis.cap.reg* between education and health, they do not differ significantly. Nevertheless, the *rural* coefficient in education is almost twice as large as the one for health.

When it comes to needs (*poor, pop, pop60, gr.areas*), their sign confirm that a pro-poor bias exist on education and other services, that the number of local inhabitants positively affects expenditure regardless of the its per head level, and that the share of above 60 year-old population raises health expenditures. Finally, the inclusion of three regional dummies is intended to detect needs as well as trend factors. As stated above, Aysen possess particular geographic and demographic features that makes public service delivery more costly, Araucanía is the poorest region in Chile and the Metropolitan region is the most populated and politically powerful one. Surprisingly, this does not fit the AISEN's coefficient, albeit it does for the cases *D\_METR* and *D\_ARAU*. Results differ across the three functions, as education and health are clearly being benefited in the metropolitan region. Conversely, Aysén and Araucaria are significantly being favored on other services.

**Table 2**  
**SUR model**

	<i>EXP<sup>j</sup></i>		
	<i>EDUCATION</i>	<i>HEALTH</i>	<i>OTHERS</i>
<i>mun.reven</i>	0.015*	0.031**	0.053**
<i>grants</i>	0.498**	0.527**	0.010**
<i>dens</i>	-0.028*	-0.043**	-0.047**
<i>rural</i>	0.180**	0.112**	0.192**
<i>dis.cap.reg</i>	0.134**	0.121**	0.419**
<i>poor</i>	0.037		0.131**
<i>pop</i>	0.230**	0.129**	0.185**
<i>pop60</i>		0.097**	
<i>Green Areas</i>			0.054**
<i>D_METR</i>	0.162**	0.204**	0.009
<i>D_AISEN</i>	-0.064	-0.302**	-0.365**
<i>D_ARAU</i>	0.062	0.047*	0.135**

\* 10% significance \*\* 5% significance.

#### **IV. Municipal Representative Expenditure per Head.**

As explained earlier, municipal level deficit (surplus) per head entails three additional steps once the empirical model is estimated. Step II in Shah' procedure consists in making the set of

predictions depicted in Eq.3, in which fiscal capacities as well as cost are taken at the national average. This leads to our *Per Capita Standardized Expenditure* ( $PCSE_m^i$ ), where  $\hat{F}^j$  is the conditional prediction from Eq.2. Step III corresponds to Eq.4 below, in which  $(PCSE)_{NA}^i$  is the *National Average Standardized Expenditure* per beneficiary.

$$PCSE_m^i = \hat{F}^j(\overline{FISCAP}, \overline{COSTS}, \overline{NEEDS}^j) \quad Eq. 3$$

$$PCSE_{NA}^i = \hat{F}^j(\overline{FISCAP}, \overline{COSTS}, \overline{NEEDS}^j) \quad Eq. 4$$

Step IV consists in estimating Eq.1. The equalization entitlement ( $EE_m^i$ ) is obtained from using Eq.1. By adding equalization values across municipalities at every region, we obtain the results presented in table 3, which are valid for 2012. A regional level data summary is presented in the appendix . Given the set of needs indicators being used, most favored regions are precisely the ones in which the actual values of this set is significantly higher than the national average. A particularly relevant one is population, which is very unevenly distributed across regions, which explains why the Metropolitan region exhibits such a high value of *EE*. The rate of poverty is another need indicator worth mentioning. Both Araucaria as well as Bio Bio exhibit above average scores of this variable, this being reflected in a relatively higher entitlement on services. Note that Aisén, O'Higgins and Los Rios are the ones less favored. In the case of Aisén, this is mainly explained by the low number of inhabitants per municipal jurisdiction. O'Higgins exhibits a relatively low population, a low average distance with the capital region and a low number of green square meters per head. Interestingly, our results support the view that the metropolitan region is a deficitary region, this result being against the common believes according to which Chile has a centralized fiscal expenditure structure.

**Table 3: Estimated value of *EE* per region - 2012**  
1000 US dollars

	<i>Education</i>	<i>Health</i>	<i>Other Services</i>
Aisén	-6,187	-633	-3,574
Antofagasta	69,936	8,939	31,184
Araucanía	-1,929	1,351	35,508
Arica y Parinacota	18,499	3,381	10,676
Atacama	6,149	211	7,512
Bio Bio	23,741	7,682	68,566
Coquimbo	23,632	8,167	40,200
O'Higgins	-8,225	76	-9,702
Los Lagos	11,668	3,636	22,018
Los Ríos	-705	-143	9,765
Magallanes	5,325	707	1,700
Maule	17,730	2,136	23,720
Metropolitana	417,603	125,098	526,386
Tarapacá	10,300	2,404	10,455
Valparaíso	51,129	19,323	43,484

## Conclusions

We take advantage of the so called “Fiscal Need Approach to Equalization” in order to evaluate the extent to which Chile is indeed a fiscally centralized country. This is done in the context of a set of fiscal capacity, cost and need indicators per municipality, which are used to estimate the additional entitlement needed to fill up the gap between existing municipal grants and the ones needed to equalize general government expenditure across the country. This exercise is made for the cases of school level education, primary health care and a myriad of other local expenditures. Some relevant regression results show that all our control variables affect expenditure per head positively, the only exception being population density. More expenditure per head is registered in the metropolitan region and the Araucanía. Aisén appears to have a lower expenditure per head. Upon a regional level consolidation of the net deficit (surplus) per region, we show that the metropolitan one should be given additional resources with respect to those currently being assigned to it, this being evidence that Chile is not a fiscally centralized country. Additionally, our study shows how difficult it is to allocate grants based on a set of need indicators. If this were feasible, the existing allocation of grants may be drastically changed.

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## APPENDIX

### Municipal averages per region (2012)

	<i>Fiscal Capacity</i>	<i>Cost Indicators</i>				<i>Need Indicators</i>		
	<i>mun reven</i>	<i>dens</i>	<i>dis.cap.reg</i>	<i>Green Areas</i>	<i>Rural</i>	<i>Population</i>	<i>Pop60</i>	<i>Poor</i>
	US dollar per head	Inhabitants per k <sup>2</sup>	kilometers	Square meters per head	% of rural population	Number of residents	% of beneficiaries aged 60 or more	Poverty Rate
Aisén	954.04	1.39	263.6	22.62	50.95	10,688	8.56	14.4
Antofagasta	1,486.95	3.52	188.2	2.17	32.02	65,348	9.29	7.4
Araucanía	231.79	48.21	83.5	3.62	47.68	30,825	12.3	30.2
Arica y Parinacota	1,206.75	9.53	615.7	9.00	59.77	45,351	11.37	17.6
Atacama	431.07	3.47	121.9	4.53	26.38	31,623	9.26	14.7
Bío Bío	256.38	187.48	98.3	3.43	35.27	38,177	11.94	23.9
Coquimbo	319.50	26.03	136.1	4.62	45.59	49,277	12.68	16.0
O'Higgins	246.37	102.55	72.8	3.17	46.70	27,278	11.48	13.2
Los Lagos	296.06	30.60	138	5.71	53.85	28,566	12.36	12.0
Los Ríos	220.70	26.17	206.1	6.27	42.58	31,810	11.60	20.3
Magallanes	1,499.22	0.87	218.2	6.10	64.45	15,958	11.25	10.9
Maule	264.16	66.83	78.9	2.28	50.66	34,123	11.47	19.9
Metropolitana	242.32	4,624.7	51.9	4.21	12.16	134,762	12.42	11.7
Tarapacá	731.99	37.00	121.5	0.96	52.81	46,989	9.00	17.5
Valparaíso	324.34	250.09	196.2	3.87	18.96	47,257	12.43	12.9