Measuring the efficiency of public expenditure in Argentine provinces

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Abstract

Despite the importance of the efficiency of public spending, there are relatively few studies which address these issues from a regional perspective. Most of the research on the subject is rather of national character. While the information contained in country studies is very valuable, a regional perspective has the advantage of allowing comparison between regions or provinces of similar level of development. This paper seeks to meet the need for evaluation of the behavior of sub-national public sector in terms of their efficiency in managing their basic activities.

We proceed in two inter-linked stages, the use of indices of expenditure and sub-national socio-economic performance, and the estimation of efficiency frontiers for public spending.

The use of indexes of expenditure and performance relates to the measurement of the performance of the Argentine provinces using information about: (i) inputs used by each jurisdiction for each object of expenditure, and (ii) final observed performance of spending for each of the jurisdictions. It is essential to construct and estimate provincial public expenditure (IGP) and Socio-economic Performance (IDSE) indices. In particular, we consider four basic needs covered by the provinces: health, education, security and infrastructure.

The next step is the estimation of efficiency frontiers, linking the provincial IGP and IDSE. Public activities are thus regarded as a production process that transforms inputs into output, so that these indices are used for the creation of a "production-possibility frontier", which synthesize the results through the creation of an index of efficiency of public expenditure (IEGP).

To estimate the "efficiency frontier" we apply the Data Envelopment Analysis (DEA) approach. This methodology allows obtaining the input-efficiency index.

Finally, an aggregate indicator of efficiency of sub-national public sector spending summarizes the specific situation of each jurisdiction.

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Introduction

Efficiency in public spending is essential for the economic, social and institutional development of countries, and is a prerequisite for the formulation of political economic consistent with the needs of the population.

The analysis of efficiency in the public sector might include, among others (see Herrera and Francke, (2009)); the magnitude of public activity in the aggregate of the economy, the lack of competition in most of the services provided, the need to show results in a restrictive budgetary context, the impact of public services in economic growth, and the welfare of the population.

In Argentina, such type of analysis acquires great importance once applied to the sub-national administrations, considering the process of decentralization of functions to the provincial governments, observed since the '90s. However, the sole decentralization of expenditure does not guarantee by itself an adequate provision of public goods and services, making it critical to establish efficiency criteria, useful for the analysis and evaluation of the management of financial resources at the state level.

The objective of this paper is to measure and standardize the efficiency of public expenditures at the provincial level in Argentina. To this end, the methodology of data envelope analysis (DEA) is applied to analyze the efficiency of public spending in Argentina's 23 provinces plus the Buenos Aires district (CABA).

The study is structured in four parts. First, the DEA methodology is reviewed followed by a section that details the indicators to be used in the estimation. An empirical application to the case of the Argentine provinces and CABA follows. The final section draws the main conclusions of this study.

The main figures of the indices used for the construction of the efficiency frontier can be found in an Annex at the end.

The measurement of efficiency

The efficiency of public expenditure has direct effects on economic and social conditions of countries and on the daily life of the population, mainly in relation to the resources used (Machado, 2006).

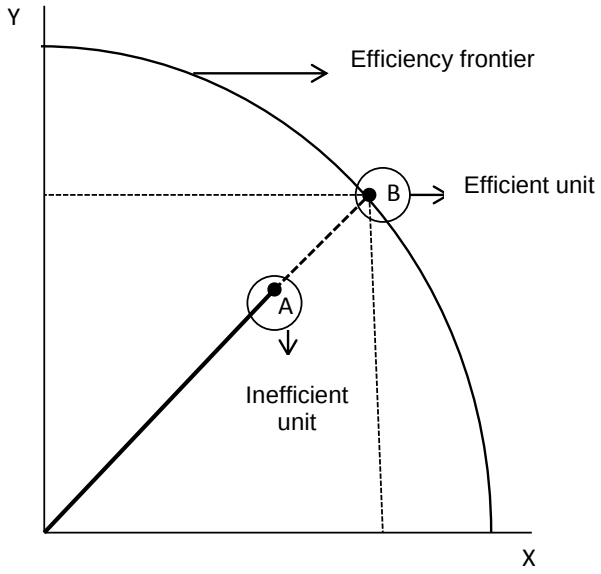
Regardless of the approach adopted, the analysis of the efficiency of public expenditure requires linking the level of spending (the total amount of resources used) with its results. This would determine if the Government should obtain more goods or services given its level of spending, or whether it should spend less given the outcomes.

The performance of management units has been analyzed traditionally through Farrell's (1957) concept of economic efficiency, which empirically determines a reference standard - the frontier - against which to compare different production units, and determine if they are efficient or not. Measures of efficiency thus calculated, define what is known as relative efficiency, i.e., they measure efficiency comparing the performance of a unit with that of a group of "best" units observed, which would shape the efficient frontier.

In general, the effects of public expenditure can be indirectly assessed based on outputs generated by a Government, or these effects can be calculated directly through their outcomes. In the first case, the analysis includes aspects of both coverage and quality of the goods and services provided by the public sector, while the second focuses on the effects of

government policies on the standard of living of the population. The relationship between resources allocated and outputs obtained is much more clear and direct than that between resources allocated and results, given the difficulty to establish causal relationships between public policies and economic and social conditions.

Figure 1: Efficiency frontier



Source: Ayaviri, N. and Quispe Fernández (2011)

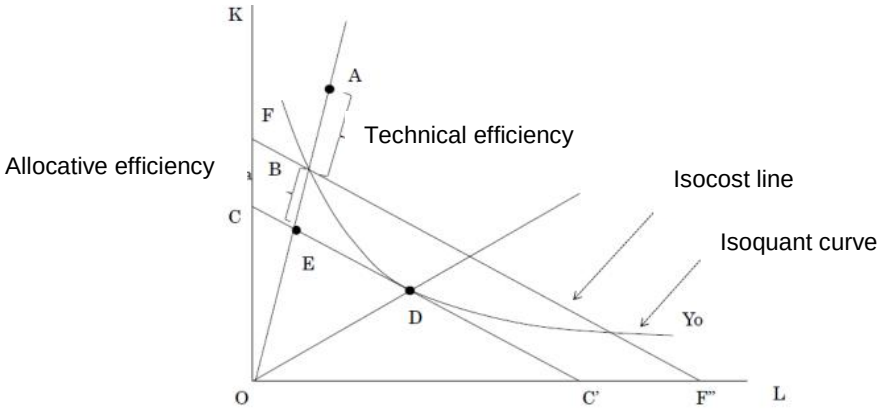
In its initial efficiency approach, Farrell (1957) establishes two concepts: 1) technical efficiency (TE), which is the ability of an economic unit to produce the maximum output possible given a set of inputs; and 2) allocative efficiency (AE), which refers to the ability to combine inputs and outputs in optimal proportions in the light of prevailing prices. Based on these concepts, Farrell (1951) defined global or economic efficiency (GE) by the product of TE and AE.

Other authors, such as Stiglitz (2002), point out the distributive efficiency, which measures not only the results obtained, but also the efficiency with which these results are distributed in the community. Distributive efficiency is achieved when resources are distributed in such a way that they maximize social welfare.

As stated above, technical efficiency is defined as the ability of an economic unit to produce a certain quantity of product using the lowest possible level of inputs, or, conversely, maximize the production given a level of inputs; while allocative efficiency refers to the ability of an economic unit to use inputs in optimal proportions given their relative prices, minimizing the cost of production.

Analytically, technical efficiency is the distance between the observed combination of inputs and the efficient combination of inputs, defined by an isoquant associated with a level of production. If the combination of resources and product of a unit is located on the isoquant, the unit is considered efficient, while it is deemed inefficient if it does not produce the highest possible level of output, given a certain level of technology; and the magnitude of its inefficiency is given by the distance to that isoquant.

Figure 2: Technical and allocative efficiency



Source: Ayaviri, N. and Quispe Fernández (2011).

This definition of technical efficiency allows defining an indicator bounded between zero and one that represent the relationship between the use of inputs and the observed outputs. A score close to zero represents an economic inefficient unit (it is distant from the isoquant associated to its level of production), while a score of one indicates maximum efficiency.

Due to the difficulty in observing prices for inputs and outputs (which are essential for the measurement of allocative efficiency), when the units involved are within the public sector, this article focuses in the measurement of technical efficiency. The data envelopment analysis methodology (DEA) is applied, a non-parametric technique that allows to combine the multiple dimensions of performance of each economic unit in the provision of a public good or service (Moskovits and Cao, 2012).

The core of the DEA technique is to solve a linear programming problem that allows measuring the relative performance of organizational units where the presence of multiple inputs and outputs makes comparisons difficult. The results are summarized in one scalar which measures the operational efficiency of the unit.

This measurement is accomplished through the construction of an enclosing surface, or frontier, from the data available from all units under study. Units on the frontier are considered efficient, while units below the frontier present inefficiencies in their productive process.

By construction, no specific functional form is assumed for the "production process" characterized by the efficiency frontier. Therefore, DEA measurements refer not to absolute efficiency but to relative efficiency, i.e. on the basis of the economic unit (or group of units) taken as a reference. For example, in the case of Argentinean provinces, those that obtain a score of 1 will be those which define the efficiency frontier. This does not indicate, however, that there is no opportunity for improvements in their results, even in cases located on the frontier.

The main advantage of DEA is that it is a non-parametric methodology, which does not impose any specific functional forms. This allows working with multiple inputs and outputs at the same time. This is an advantage when assessing the efficiency of the public sector, since there are many indicators relevant to analyze public management.

Still, results may be sensitive to the selection of variables. Also, in the process of formulation of the DEA model, a technical choice must be made regarding returns to scale (constant, growing, decreasing, variable), that in turn determine the features of the mathematical problem to solve.

As regards the orientation of the model, that is, how the inefficiency score of the units is analyzed; DEA can be carried through three configurations: 1) inputs-oriented, seeking the maximum proportional reduction in inputs for a given level of output, 2) outputs-oriented, seeking the maximum increase in outputs for a given level of inputs, and 3) a mixed Input-Output, that simultaneously seeks the reduction of inputs and expansion of product (Bogetoft & Otto, 2011).

In this paper, two particular input-oriented models of DEA are portrayed. The first one is built using the constant returns to scale (DEA-CRS) framework, while in the second case, variable returns to scale (DEA-VRS) are assumed.

DEA-CRS

Under the constant returns to scale hypothesis, the frontier assumes a linear form. Assuming there are *n* economic units, and each of them produces *m* different outputs using *k* different inputs; the formal solution of the DEA-CRS model involves solving the following problem:

$$\min_{\theta,\lambda} \theta$$

Subject to:

$$-y_i + Y\lambda \geq 0$$
$$\theta x_i - X\lambda \geq 0$$
$$\lambda \geq 0$$

Where y_i is the vector of outputs produced by the i-th economic unit, x_i is the vector of inputs used by the i-th economic unit, Y is the (m × n) matrix of outputs for all n economic units, and X is the(k × n) matrix of inputs for the n economic units. λ represents the (n × 1) vector of constants that can be read as the weights needed to estimate the location of an inneficient unit, should this unit be switch to be efficient. Thus, inefficient units could be cast over the frontier as a linear combination using these weights. The scalar θ represents the technical efficiency of a given province.

DEA-VRS

Unlike the DEA-CRS methodology, under the assumption of variable returns to scale the frontier assumes a convex shape, which is constructed by adding to the previous model the restriction $n1'\lambda = 1$, where $n1$ is a n-dimensional vector of ones, while the rest of the previously used notation is the same as in the CRS model. Thus, the linear programming problem to solve now is:

$$\min_{\theta,\lambda} \theta$$

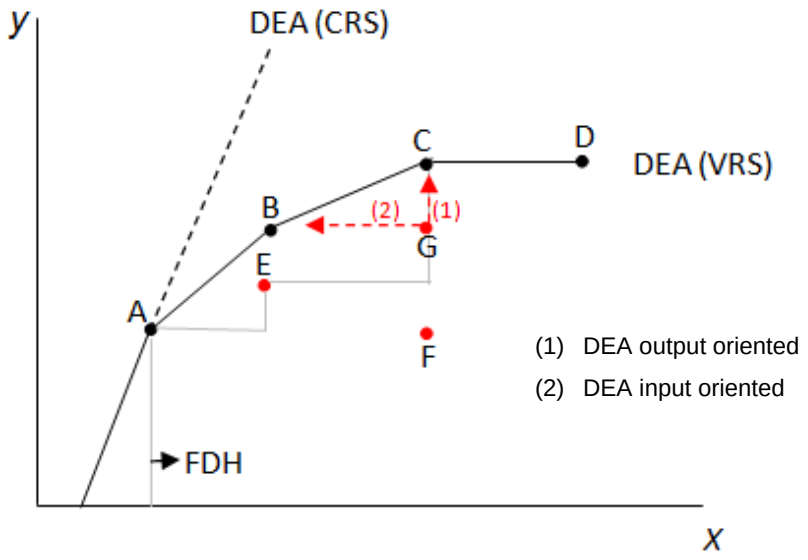
Subject to:

$$-y_i + Y\lambda \geq 0$$
$$\theta x_i - X\lambda \geq 0$$
$$n1'\lambda = 1$$
$$\lambda \geq 0$$

As mentioned, efficiency (θ) is measured as the distance between a province and the production possibility frontier, which is defined as the linear combination of the best observations in the group. This scalar takes values between 0 and 1:

- $0 \prec \theta_i \prec 1$: the i-th economic unit is inefficient, since it is located below the efficient production frontier.
- $\theta_i = 1$: the i-th economic unit is on the frontier, and is deemed as efficient and serves as a reference unit for the rest of units.

Figure 3: Efficiency frontier. DEA CRS y DEA VRS.



In

Figure 3 the efficiency frontier for C is represented by a straight line from a point in the X axis through A. In this methodology, only one unit is considered efficient. Conversely, the VRS efficiency frontier is convex and encompasses economic units, B, C and D. Units E, F and G, with similar use of inputs to B and C, attain lower levels of product and are considered inefficient.

This figure also summarizes the difference between the two estimation approaches. A DEA input-oriented, (1), regards as inefficiency the vertical distance between the economic unit G and C; while the DEA output-oriented, (2), views as inefficient the horizontal distance between units G and B. A third approach, DEA input-output-oriented (or directional efficiency, not shown in the Figure) penalizes the distance between unit G and a virtual point on the frontier that is hyperbolically equidistant to C and B.

Finally, is important to highlight that two different units could be considered as efficient under the different approaches, but their efficiency scores will match only in the case of constant returns to scale.

An aspect to emphasize is that the DEA analysis makes no statement about the optimal size of the production unit, and only evaluates the relationship between total inputs and the resulting output. In Figure 3, unit D attains the same level of output as C, using more inputs, but is still on the efficiency frontier. Although this is not necessarily a disadvantage of the analysis, it could be the case that a unit far larger than the rest is considered efficient, even while it use more inputs, since the frontier is built using these units.

Expenditure and performance indexes

With a focus on the performance of the 24 Argentine jurisdictions, rates of socio-economic performance (IDSE) and public spending (IGP) were built, to be used in the analysis of efficiency as outputs and inputs, respectively.

Sub-national public expenditure indicators capture priorities of provincial governments, under the assumption that they affect directly or indirectly socio-economic development, the formation of human resources, and capital accumulation.

The variability observed between indicators, reflection of the socioeconomic heterogeneity of Argentinean jurisdictions, imposes conditions on their use. Consequently, we selected three different indicators to act as inputs in the analysis, for each of the public functions that are the subject of this study: average per capita public expenditure, average public expenditure as a percentage of total spending, and average public expenditure as a percentage of provincial GDP.

Achieving relevant improvements in areas such as education, health and infrastructure, demand clear long-term public policies. Therefore, considering the functional classification of expenditure, and given the extreme volatility of capital outlays that are potentially present within each of these functions, it is convenient to use the average of the expenditure in these categories over the last years.

Working with specific functions of public expenditure, the methodology does not consider potential spillover effects affecting other areas. For example, a province could obtain good results in its public health indicators with a low expenditure in that function, but with significant amounts committed to social programs. The empirical consideration of such effects is outside the scope of the article.

As regards to the performance indicators, there is no consensus on the most appropriate variables to measure the efficiency of public expenditure and the choice depends substantially on the available data and/or policy objectives. However, in the case where there are no measurements of outcomes, a proxy of the measurement of efficiency is obtained through the use of the outputs of the state activity, which measure the level of public good or service which is provided, and are used as an approach to the achievement of the objective behind the action of Government.

Below are the indicators that will be used as inputs (indicators of public expenditure) and outputs (Socio-economic performance indicators), along with a brief overview of the construction of the indicators in each of the areas under study.

Health constitutes one of the areas of greater importance for the subnational governments of Argentina, since a large part of its administration is under the orbit of the provincial governments. Also, such spending is very relevant given the positive externalities upon the quality of life of the citizens.

The Socio-economic performance indicators in health (IDSE health) are: gross mortality rate, maternal mortality rate and child mortality rate, obtained from the Directorate of Health statistics and information of the National Health Ministry. It should be noted that in the cases in which a lower value of the variable indicates a better performance, in the construction of the indexes, higher values indicate a better performance.

The inputs for health production are summarized in an index of public expenditure on health (IGP in health), built from the functional expenditure in “health”. As mentioned previously, health expenditure is measured in per capita terms, as a proportion of GDP, and as a proportion of total spending, and as an average for the years 2011-2013 and 2001-2003. These indices were rewriten so that the average of 24 sub-national jurisdictions takes the value of one.

With regards to the measurement of efficiency of public expenditure on education, the output is the Socio-economic performance index in education (IDSE in education), which at the primary level compiles literacy rate, the inverse of the average rates of repetition, over-age, dropouts and the pupil / teacher ratio, while in the elementary cycle measures the inverse of the average rates of repetition, overage, dropouts and the pupil / teacher ratio. Literacy information is extracted from the INDEC Census of 2001 and 2010, and the remaining information comes from the Ministry of education.

Meanwhile, levels of public expenditure on education (IGP in education) will serve as inputs for the supply of this service. The indices to be used are the expenditure on education in per capita terms, spending on education as a share of PBG and as a proportion of total expenditure, considering the average values for the years 2001-2003 and 2010-2013. In addition, indexes are built re-scaling the figures so that the average of the 24 sub-national jurisdictions takes the value of one.

The incorporation of efficiency in infrastructure provision will be performed using the role of the government as investor. The output indicator is the index of socio-economic performance in infrastructure (IDSE in Infrastructure), which will be the inverted index of a composed measure of homelessness (housing deficit) and the percentage of the population with access to safe water, both indexes based on information from the household survey EPH (Encuesta Permanente de Hogares) from INDEC.

The inputs in this case are summarized in the index of public expenditure on infrastructure (IGP in infrastructure) which are made of expenditures in the function “Housing and community amenities” in per capita terms, expenditure on this function as a proportion of GDP and as a proportion of the total expenditure of the respective sub-national Government. Average figures are obtained for the years 2001 - 2003 and 2011-2013. As in the previous cases, indexes are built re-scaling the figures so that the average of the 24 sub-national jurisdictions takes the value of one.

Finally, in reference to the efficiency of the public sector in public order and safety, a Socio-economic performance indicator in safety (IDSE in safety) was built, which incorporate as a crime rate the rate of crimes of common law per 100,000 inhabitants. This index is built on the basis of reports of the National System of Criminal information from the National Bureau of Criminal Policy of the Ministry of Justice and Human Rights. In this variable, a lower value indicates a better performance, so in the construction of the indexes higher values indicate better performance.

The input Indices in this area of public expenditure in safety (IGP in security) use information on expenditure in defense and security in per capita terms, as proportion of GDP and as proportion of total provincial expenditure, as averages from years 2001-2003 and 2006-2008,

an indexes are built re-scaling the figures so that the average of the 24 sub-national jurisdictions takes the value of one.

With regards to the measurement of efficiency in security, the latest available data is for the year 2008. Also, in this indicator, the CABA jurisdiction is excluded. The city of Buenos Aires has no own penitentiary service and his security force, the metropolitan police, was created in the year 2008, so its inclusion would introduce distortions in the aggregate analysis.

Estimation Results

The results of implementing the efficiency measurement methodology previously developed in the areas of Health, Education, Infrastructure and Safety are exposed next. In the end of this section, an indicator of aggregate public sector efficiency, incorporating the different dimensions considered, is presented.

Efficiency in Health

From the analysis of subnational efficiency in health, we infer that in 2003 six of the twenty-four jurisdictions were on the frontier, thus becoming points of reference to assess the performance of the remaining sub-national governments. In addition, provinces that are below the frontier, showed inefficiencies since they spent relatively more, given the results that they showed (input-efficiency). In this particular year, the efficient provinces were CABA, Corrientes, Mendoza, Misiones (considering the constant returns to scale approach). Meanwhile, Rio Negro and Tierra del Fuego are added if variable returns to scale are assumed.

In the group of provinces that are located inside the frontier, the case of Buenos Aires is highlighted, presenting an input efficiency which was around 30% depending on the model used, which means that to be efficient, it should have decreased spending by 70%, while maintaining the outcomes.

It is of interest to highlight statistics such as the standard deviation and the average of the set of provinces. In the case of CRS the average efficiency was 59.4% with a standard deviation of 25,22 percentage points, reflecting a high degree of variability (coefficient of variation of 0.42). In the case of VRS, the average raises slightly till 68.6%, and the standard deviation decreases 1.2 p.p., (to 24.2 points), which reflects in a coefficient of variation of 0.35. This could be an indicator that the model that presents a better fit is the one that assumes variable returns to scale, at least in the health sector.

Table 1: Efficiency in Health

Province	2003		2013		Evolution	
	DEA-CRS	DEA-VRS	DEA-CRS	DEA-VRS	DEA-CRS	DEA-VRS
Buenos Aires	30%	33%	41%	48%	10,70	15,13
CABA	100%	100%	100%	100%	0,00	0,00
Catamarca	43%	44%	68%	77%	25,01	32,77
Chaco	72%	72%	62%	65%	-10,00	-6,59
Chubut	34%	37%	44%	55%	10,83	18,12
Córdoba	72%	82%	100%	100%	27,52	18,26
Corrientes	100%	100%	81%	87%	-19,38	-12,88
Entre Ríos	58%	66%	62%	64%	4,80	-2,11
Formosa	55%	58%	48%	52%	-7,03	-5,90
Jujuy	61%	61%	100%	100%	39,01	38,93
La Pampa	42%	39%	38%	43%	-3,96	4,06
La Rioja	35%	42%	63%	64%	28,06	21,77
Mendoza	100%	100%	100%	100%	0,00	0,00
Misiones	100%	100%	100%	100%	0,00	0,00
Neuquén	29%	66%	48%	68%	18,92	1,49
Río Negro	56%	100%	53%	55%	-3,05	-44,69
Salta	61%	58%	73%	74%	12,75	15,64
San Juan	44%	51%	68%	74%	23,83	22,70
San Luis	46%	48%	86%	100%	40,52	51,86
Santa Cruz	19%	42%	28%	44%	8,62	2,33
Santa Fe	88%	95%	75%	84%	-13,26	-11,06
Santiago del Estero	70%	69%	93%	100%	23,83	30,99
Tierra del Fuego	32%	100%	45%	100%	13,29	0,00
Tucumán	79%	84%	73%	73%	-5,52	-10,26
Mean	**59,4%**	**68,6%**	**68,7%**	**76,1%**	**9,39**	**7,52**
Standard Deviation	**25,22**	**24,02**	**22,63**	**20,49**	**-10,3%**	**-14,7%**
Coefficient of variation	**0,42**	**0,35**	**0,33**	**0,27**	**-0,10**	**-0,08**

In reference to the efficient jurisdictions, it is worth mentioning again that this does not mean that there were not aspects that will allow improving the spending efficiency. Efficiency here simply means that, in comparison to the other provinces, these were the most efficient given their level of public spending.

By applying the same methodology to the information available for the year 2013, it was possible to derive an input-oriented "possibilities of production frontier" for the 23 provinces and CABA for this year, assuming constant and variable returns to scale. The results are shown in Table 1.

In 2013 eight provinces are found on the frontier if VRS are considered -Jujuy, CABA, Cordoba, Mendoza, Misiones, San Luis, Santiago del Estero and Tierra del Fuego -, two

jurisdictions more as compared to 2003. Considering CRS the number decreases to six units - excluding San Luis and Santiago del Estero.

The provinces that presented the lowest scores under the DEA-CRS, -La Pampa, Santa Cruz and Buenos Aires- show systematically a low efficiency in the year 2013, which can reflect the increase observed in mortality in these jurisdictions, in which the increase of the expenditure in health for the period 2011-2013 has not had a visible effect. Here, it is noticeable that Buenos Aires and La Pampa were in the first and fifth place in terms of the indicator of expenditure in health in 2013, but their values of gross mortality were among the highest: 11.2% and 7.1% respectively.

Under the DEA-VRS model, the average efficiency of the subnational jurisdictions in 2013 is 76.1%, so there is 23.9% of the resources that are not used (compared to 68.6% in 2003) and there is a decline in the standard deviation, which stood at 20 points, and the coefficient of variation was 0.25. Again, this is considered an indicator that the proper form of the PPF would correspond to VRS model.

Having evaluated the efficiency of sub-national Governments in both periods, it is of relevance to identify changes in the efficiency performance of the expenditure in health of the jurisdictions over the past decade. An increase in efficiency of the units is observed, since the average increased 9,39 points and 7,52 points, while the standard deviations showed decreases of 10,27 and 14.72 points, in the DEA-CRS and the DEA-VRS respectively.

Provinces with greater improvements in the child mortality rates in the last decade Córdoba, Chubut, Catamarca, San Luis, Misiones and Entre Ríos. Opposite to this, in Corrientes and Neuquén the child mortality rate increased slightly over the period. With respect to the gross mortality rate (TBM), provinces who presented a better performance in health were Tierra del Fuego and Neuquén. At the extreme opposite we found CABA, Santa Fe and Buenos Aires.

The previous findings show that improvements in health have taken place, in the cases of Cordoba, Misiones, San Luis, and Tierra del Fuego, with additional increases in relative efficiency, which places them on the frontier in the year 2013, since they show a growth in its effectiveness. However, the case of Buenos Aires is highlighted, where the increase occurred in outlays directed to health has not improved the gross mortality indicators, thus increasing its relative inefficiency.

The case of Misiones is of particular interest, since under the model of variable returns to scale, it managed to maintain its level of efficiency by decreasing spending on health along with a reduction of child mortality.

Cordoba and Jujuy showed in 2013 the most encouraging results in relation to the rates of child mortality, with improvements (falls) greater than 45% in the case of Córdoba, and greater than 30% in the case of Jujuy. This occurred, in the first case, despite being one of the provinces that devoted relatively lower amount of funds to health, with the opposite behaviour in the case of Jujuy.

Efficiency in Education

The analysis of efficiency in education of subnational governments shows that out of the 24 jurisdictions under analysis, in 2003, fourteen were on the PPF - Buenos Aires, CABA,

Catamarca, Corrientes, Entre Ríos, Formosa, La Pampa, missions, Rio Negro, Salta, San Luis, Santa Cruz, Tierra del Fuego, Tucumán-.

Clearly, this does not mean that there is no room to improve efficiency in this area. Rather, it simply means that, in comparison to the other provinces, these were the most efficient given their level of public spending.

Inside of the frontier we found, for example, the province of La Rioja, that in the year 2003 presented an input efficiency of 72%, which means that to be efficient it should have decreased the public expenditure in 28% while keeping the results obtained. Another case is that of the province of Santiago del Estero, where inefficiency is around the 18% of its expenditure.

As in the case of efficiency in health, average and deviation standard values are important to analyze. Both in the case of the DEA-CRS and the DEA-VRS, average efficiency is ranked higher than 94%, with a standard deviation of 8.06 and 7.81, respectively, with coefficients of variation with values of 0,085 and 0,082. This can be taken as evidence of a high concentration of values of high relative efficiecy in the provinces.

Table 2: Efficiency in Education

Province	2003		2013		Evolution	
	DEA-CRS	DEA-VRS	DEA-CRS	DEA-VRS	DEA-CRS	DEA-VRS
Buenos Aires	100%	100%	100%	100%	0,00	0,00
CABA	100%	100%	100%	100%	0,00	0,00
Catamarca	100%	100%	100%	100%	0,00	0,00
Chaco	84%	88%	87%	87%	2,52	-1,17
Chubut	93%	93%	100%	100%	7,14	6,94
Córdoba	93%	93%	100%	100%	6,86	7,15
Corrientes	100%	100%	80%	80%	-20,38	-20,38
Entre Ríos	100%	100%	93%	93%	-7,26	-6,57
Formosa	100%	100%	100%	100%	0,00	0,00
Jujuy	86%	87%	100%	100%	14,28	13,46
La Pampa	100%	100%	100%	100%	0,00	0,00
La Rioja	73%	72%	100%	100%	27,37	27,81
Mendoza	87%	88%	95%	95%	7,41	7,03
Misiones	100%	100%	100%	100%	0,00	0,00
Neuquén	87%	88%	100%	100%	12,82	12,48
Río Negro	100%	100%	99%	100%	-0,94	0,00
Salta	100%	100%	100%	100%	0,00	0,00
San Juan	83%	83%	86%	86%	2,79	2,34
San Luis	100%	100%	100%	100%	0,00	0,00
Santa Cruz	100%	100%	100%	100%	0,00	0,00
Santa Fe	93%	93%	84%	84%	-9,55	-8,93
Santiago del Estero	82%	82%	100%	100%	18,35	17,77
Tierra del Fuego	100%	100%	100%	100%	0,00	0,00
Tucumán	100%	100%	100%	100%	0,00	0,00
Mean	**94,2%**	**94,4%**	**96,8%**	**96,9%**	**2,56**	**2,41**
Standard Deviation	**8,06**	**7,81**	**6,24**	**6,18**	**-22,6%**	**-20,8%**
Coefficient of variation	**0,09**	**0,08**	**0,06**	**0,06**	**-0,02**	**-0,15**

The values for the year 2013 can also be seen in Table 2. Generally, the comparison is positive: there has been a clear increase in efficiency in the execution of public spending on education. The average of efficiency increased by 2.56 p.p, which could be considered as a remarkable advance, since the level in 2003 was above 94%. When the dispersion of values is considered, it is noticeable that it decreased, in an average of 21.7%, and the coefficient of variation is ranked in 0,064 for the DEA-CRS and 0,063 for the DEA-VRS. This allows to conclude that there was a general advance of the jurisdictions with regard to the homogenization of their efficiency levels.

The case of greatest notoriety is La Rioja, which increased its efficiency 27.8 percentage points, making it one of the provinces that determine the efficiency frontier in education in the most recent period.

There were, however, cases of jurisdictions in which the efficiency decreased relative to the rest. The most significant of this is Corrientes, which lost 20.4 points of efficiency regardless the method of analysis. The origin of this reduces of score steems from the fact that the remaining provinces managed to achieve major advances in the educational quality. For instance, while in 2003 the rate of primary repetition in Corrientes was 11.96%, this value was 9.93% in 2012, while there were provinces such as La Rioja, where this figures declined 4.51 points, going from 8.07% to 3.56%. In addition, Corrientes presented a growth in funds for education, both in per capita terms and as a percentage of total spending, which drives the contraction in efficiency relative to all other jurisdictions.

Efficiency in Infrastructure

This section aims to calculate the results in terms of efficiency of subnational infrastructure policy. Infrastructure in this study is defined as the provision of housing and sanitation, which are normally under the responsibility of provincial Governments.

Based on the indexes related to infrastructure, a "possibilities of production frontier" (FPP) is built for the provinces, on the basis of the best practices observed in the provinces.

In the year 2003, 11 jurisdictions might be classified as efficient if VRS are assumed, while the number drops to 5 if CRS is considered to be the case. Given the multidimensional nature and the notorious differences observed in the indicators of the jurisdictions, the most realistic approach appears to be the VRS model.

In the VRS case, the efficiency average is of 77.6%, while the dispersion was 25,88 p.p in average, and the coefficient of variation is of 0.33.

Among the larger Argentinean jurisdictions (Buenos Aires, CABA, Cordoba and Santa Fe), only Buenos Aires is not efficient, with an average of misuse of 12% of resources applied to this area. In the case of Tucumán, there was an estimated loss of 43% of resources used for the management of infrastructure that failed to obtain the desired results. However, it is necessary to underline that in this particular study, specific factors such as the stock of infrastructure of the provinces, or institutional and historical issues that could affect the performance of the public sector, are not considered.

When the analysis is carried out for the year 2013, five jurisdictions are deemed efficient (Buenos Aires, CABA, Jujuy, Río Negro and Santa Fe) under the assumption of constant returns to scale, and twelve if we consider the existence of variable returns to scale. In the

first case, DEA-CRS, average efficiency reaches 61.6%, with a standard deviation of 26,04 points, and a coefficient of variation of 0.42; while in the second model, DEA-VRS, the average of efficiency was higher, 82%, although with a slightly lower standard deviation, 24,81 points, with a coefficient of variation of 0,302.

Table 3: Efficiency in Infrastructure

Province	2003		2013		Evolution	
	DEA-CRS	DEA-VRS	DEA-CRS	DEA-VRS	DEA-CRS	DEA-VRS
Buenos Aires	69%	88%	100%	100%	31,37	11,98
CABA	100%	100%	100%	100%	0,00	0,00
Catamarca	63%	85%	47%	100%	-16,25	14,53
Chaco	100%	100%	74%	87%	-25,66	-12,57
Chubut	42%	56%	58%	100%	16,24	44,36
Córdoba	92%	100%	67%	100%	-24,42	0,00
Corrientes	34%	49%	58%	100%	24,09	51,30
Entre Ríos	89%	100%	77%	100%	-12,09	0,00
Formosa	100%	100%	82%	77%	-18,47	-23,14
Jujuy	62%	100%	100%	48%	37,71	-52,47
La Pampa	16%	16%	24%	100%	8,14	83,78
La Rioja	43%	100%	67%	83%	24,76	-16,93
Mendoza	51%	61%	68%	100%	17,49	38,96
Misiones	34%	35%	39%	29%	5,49	-6,32
Neuquén	51%	78%	36%	88%	-14,68	10,22
Río Negro	100%	100%	100%	100%	0,00	0,00
Salta	55%	72%	60%	40%	4,71	-31,90
San Juan	40%	44%	52%	29%	12,05	-14,87
San Luis	26%	100%	23%	100%	-3,50	0,00
Santa Cruz	38%	100%	20%	93%	-17,83	-6,94
Santa Fe	100%	100%	100%	81%	0,00	-18,82
Santiago del Estero	47%	50%	46%	62%	-0,63	12,00
Tierra del Fuego	24%	75%	39%	100%	14,94	25,35
Tucumán	42%	52%	40%	49%	-1,19	-3,35
Mean	**59,0%**	**77,6%**	**61,6%**	**82,0%**	**2,60**	**4,38**
Standard Deviation	**27,87**	**25,88**	**26,04**	**24,81**	**-6,6%**	**-4,2%**
Coefficient of variation	**0,47**	**0,33**	**0,42**	**0,30**	**-0,05**	**-0,03**

The provinces under study, as a group, have increased their efficiency in the provision of basic infrastructure, which is reflected in the rise of average efficiency and the rise in the number of jurisdictions on the frontier (mainly in the DEA-VRS). There is also a reduction in the standard deviation. Yet some jurisdictions, such as Formosa, Chaco and Jujuy had notorious falls in its efficiency, which worsens the provincial average.

CABA, Córdoba and Río Negro managed to maintain their levels of relative efficiency in the period under analysis (DEA-VRS), throughout processes that managed to maximize the efficiency of its public intervention. In the case of Cordoba, although in 2003 it was not in the frontier, it was very close to it, with a score superior to the 90% of efficiency in the use of resources.

Finally, we notice some elements that could not been considered. Urban migration towards provinces of higher economic growth generates increased demographic pressures and higher demands of services, as a result of which the indicators have a tendency to deterioration in these provinces. In addition, it should be noted that the current system of financing of the provinces is strongly distorted in relation to the revenue sharing system, whereupon the subnational jurisdictions cannot access to all the necessary funds in this sector. Also, there has been intervention by the federal Government on the creation of part of the analyzed infrastructure (housing).

Efficiency in Safety

Based on the indexes of public spending on security, and the crime rate, a "production possibility frontier" (FPP) for the provinces was built, on the basis of the best practices observed in the provinces.

The analysis shows that only one province was considered efficient, Mendoza, under the DEA-CRS approach. For the entire group of provinces, the average of efficiency is of 54.3%, with a standard deviation of 21.8%, and a coefficient of variation of 0.4.

Under the alternative approach, DEA-VRS, the number of efficient jurisdictions is increased to five: Córdoba, Mendoza, Misiones, Neuquén and San Juan. The positioning on the frontier in these cases is due to the fact that, in comparison with other provinces, they have a superior performance of its inputs, given the level of product reached. For example, in the case of Córdoba, the province is on the frontier since its crime rate index, 0.82, is associated with a low level of per capita spending (index of 0.61), which positions it as a relatively efficient province when compared to Buenos Aires, which allocates a level of expenditure as a proportion of GDP (or in per-capita terms) similar to that of Misiones, but obtains worse results.

The summary measures show that under VRS, average efficiency of 73.5% is superior to the CRS case, although the standard deviation is also increased, and reaches 23,74. The coefficient of variation showed a decline, reaching 0.32.

When the analysis is carried for the year 2008, five of the provinces are on the efficiency frontier -Córdoba, Mendoza, Misiones, Neuquén and San Juan- under VRS in the production. When CRS are considered, only one of them is fully efficient-Mendoza-, although the other 4 provinces show scores very close to the full efficiency as defined in this study.

In the DEA-CRS case, efficiency average is 53.2%, with a standard deviation of 24,61 p.p, whereupon the coefficient of variation is 0.46. If the model is the DEA-VRS, average efficiency of the provinces would be of 68.6%, with a standard deviation slightly lower to the previous case, 24,43, and a coefficient of variation of 0.36.

Of the comparison between the measures of efficiency in both periods, the average performance for all the provinces is slightly lower in 2008 than in 2003, regardless the method used for the analysis of efficiency. Provincial average of efficiency under CRS has decreased 1.1 p.p, while under VRS, efficiency fell 4.9 p.p. Larger changes are observed with regard to the variability of the information. Under CRS, variability increases 12.9% between 2003 and 2008, while under VRS, the rise is only 2.9%.

Table 4: Efficiency in Safety

Province	2003		2008		Evolution	
	DEA-CRS	DEA-VRS	DEA-VRS	DEA-CRS	DEA-VRS	DEA-CRS
Buenos Aires	38%	68%	33%	58%	-5,03	-9,23
CABA	NA	NA	NA	NA	NA	NA
Catamarca	58%	67%	31%	44%	-27,06	-23,04
Chaco	71%	87%	45%	61%	-26,08	-26,52
Chubut	62%	82%	68%	88%	5,71	6,05
Córdoba	90%	100%	95%	100%	5,09	0,00
Corrientes	30%	44%	25%	48%	-5,72	4,29
Entre Ríos	33%	62%	31%	45%	-2,21	-16,35
Formosa	39%	54%	41%	59%	2,31	5,03
Jujuy	73%	90%	74%	82%	0,68	-8,11
La Pampa	57%	64%	38%	45%	-19,75	-19,09
La Rioja	30%	47%	31%	46%	0,77	-1,07
Mendoza	100%	100%	100%	100%	0,00	0,00
Misiones	63%	100%	66%	100%	3,82	0,00
Neuquén	48%	100%	46%	100%	-1,56	0,00
Río Negro	46%	59%	50%	59%	4,77	-0,02
Salta	64%	91%	92%	99%	28,24	7,84
San Juan	93%	100%	90%	100%	-2,39	0,00
San Luis	60%	87%	55%	66%	-4,56	-20,80
Santa Cruz	26%	27%	22%	27%	-3,87	0,21
Santa Fe	56%	74%	70%	78%	13,89	3,73
Santiago del Estero	48%	79%	41%	63%	-6,70	-16,68
Tierra del Fuego	14%	19%	21%	27%	6,95	8,08
Tucumán	50%	89%	57%	82%	7,36	-6,90
Mean	**54,3%**	**73,5%**	**53,2%**	**68,6%**	**-1,10**	**-4,90**
Standard Deviation	**21,80**	**23,74**	**24,61**	**24,43**	**12,9%**	**2,9%**
Coefficient of variation	**0,40**	**0,32**	**0,46**	**0,36**	**0,06**	**0,03**

It is precise to note that, given the lack of information, the period of analysis (of 5 years), could not be enough to reflect the impact of different policies that require of an increase of expenditures in the present to report results in the medium and long term.

Aggregate Efficiency

With the information on efficiency of subnational governments from the previous sections, an indicator of aggregate efficiency of subnational governments is built as average of the indicators of efficiency in security, infrastructure, education and health. We use a simple average since the literature agrees in that discrimination cannot be made in favor of any of the areas of performance of the public sector.

The results under the VRS method are highlighted, since this estimation method minimized, in general, the dispersion of the values of efficiency estimated. Also, the particular shape of the frontier under CRS could not capture possible efficiency gains that occur by providing a homogeneous public good in the presence of declining marginal costs, which favor the units of larger size, at the expense of the provinces with lower population and larger territory.

Table 5: Aggregate Efficiency

Province	2003		2013		Evolution	
	DEA-CRS	DEA-VRS	DEA-CRS	DEA-VRS	DEA-CRS	DEA-VRS
Buenos Aires	59%	72%	69%	77%	9,26	4,47
CABA	100%	100%	100%	100%	0,00	0,00
Catamarca	66%	74%	61%	80%	-4,58	6,06
Chaco	82%	87%	67%	75%	-14,81	-11,71
Chubut	58%	67%	68%	86%	9,98	18,87
Córdoba	87%	94%	91%	100%	3,76	6,35
Corrientes	66%	73%	61%	79%	-5,35	5,58
Entre Ríos	70%	82%	66%	76%	-4,19	-6,26
Formosa	73%	78%	68%	72%	-5,80	-6,00
Jujuy	70%	84%	93%	82%	22,92	-2,05
La Pampa	54%	55%	50%	72%	-3,89	17,19
La Rioja	45%	65%	65%	73%	20,24	7,89
Mendoza	84%	87%	91%	99%	6,22	11,50
Misiones	74%	84%	76%	82%	2,33	-1,58
Neuquén	54%	83%	58%	89%	3,88	6,05
Río Negro	75%	90%	76%	79%	0,20	-11,18
Salta	70%	80%	81%	78%	11,43	-2,11
San Juan	65%	70%	74%	72%	9,07	2,54
San Luis	58%	84%	66%	91%	8,11	7,77
Santa Cruz	46%	67%	42%	66%	-3,27	-1,10
Santa Fe	84%	91%	82%	82%	-2,23	-8,77
Santiago del Estero	62%	70%	70%	81%	8,72	11,02
Tierra del Fuego	43%	73%	51%	82%	8,79	8,36
Tucumán	68%	81%	68%	76%	0,16	-5,13
Mean	**67,2%**	**78,8%**	**70,6%**	**81,2%**	**3,37**	**2,41**
Standard Deviation	**14,21**	**10,43**	**14,09**	**9,07**	**-0,8%**	**-13,1%**
Coefficient of variation	**0,21**	**0,13**	**0,13**	**0,20**	**-0,08**	**0,07**

In the analysis for the year 2003, it can be observed that the average level of efficiency is of 78.8% in the DEA-VRS model, while the deviation standard is of 10,4 points. In the case of the DEA-RCS model, the average of 67.2% implies that 32.8% of public resources have not been properly used, with a standard deviation of 14,2 points.

CABA, Córdoba, Santa Fe and Mendoza displayed the highest levels of efficiency, therefore the processes used for the management of public activity in those jurisdictions would imply the less waste of resources. Only a 9% of those resources, as a maximum in the case of Santa Fe, did not generate the desired impact. However, this measure is a reflection of how indicators were built, which may exclude some relevant dimension, for example in the political management of the provinces and CABA.

The provinces with the lowest efficiency were in general the southern provinces, typically those with low population density and increased costs resulting from longer distances and higher living costs. Also a northern province, La Rioja, which at odds with its neighboring provinces, not managed to rise above 65% of efficiency.

In relation to the efficiency of the public administration for the average of years 2011-2013, CABA, Córdoba and Mendoza make up the group of greatest efficiency, even with scores of 100%, as a reflection of the development of public expenditure systems focused on the goods and services under study. Conversely, Santa Cruz is the only province with a level of efficiency lower to the 70%, while the remaining southern provinces managed to increase its levels of efficiency.

The efficiency scores ranked in average at 81.2%, with a standard deviation of 12.2 points, which reflects a coefficient of variation of 0.11, among the lowest variation measures of this study.

In comparison with the results observed in 2003, the model that assumes VRS showed an increase of 2.41 percentage points in average efficiency, and a decrease of the standard deviation in 13.1%, This increase of efficiency tended to concentrate the values around the units with best practices.

Table 6: Province ranking of aggregate efficiency

Province	2003		2013		Evolution
	Aggregate efficiency	Position	Aggregate efficiency	Position	
Buenos Aires	72,1%	18	76,6%	16	2
CABA	100,0%	1	100,0%	1	0
Catamarca	74,0%	15	80,1%	12	3
Chaco	86,7%	6	75,0%	19	-13
Chubut	66,9%	22	85,8%	6	16
Córdoba	93,6%	2	100,0%	2	0
Corrientes	73,2%	17	78,8%	13	4
Entre Ríos	81,9%	11	75,6%	18	-7
Formosa	78,0%	14	72,0%	22	-8
Jujuy	84,4%	7	82,4%	7	0
La Pampa	54,7%	24	71,9%	23	1
La Rioja	65,3%	23	73,2%	20	3
Mendoza	87,2%	5	98,7%	3	2
Misiones	83,8%	8	82,3%	8	0
Neuquén	83,0%	10	89,1%	5	5
Río Negro	89,8%	4	78,7%	14	-10
Salta	80,3%	13	78,2%	15	-2
San Juan	69,6%	20	72,2%	21	-1
San Luis	83,7%	9	91,5%	4	5
Santa Cruz	67,2%	21	66,1%	24	-3
Santa Fe	90,5%	3	81,8%	9	-6
Santiago del Estero	70,2%	19	81,2%	11	8
Tierra del Fuego	73,3%	16	81,7%	10	6
Tucumán	81,3%	12	76,1%	17	-5

The particular analysis of jurisdictions shows that Rio Negro, Chaco and Santa Fe are among the provinces that have shown the more decline in efficiency between the two periods; while Chubut, La Pampa, Mendoza and Santiago del Estero are those that presented further advances, increasing their efficiency between 11 and 18 points.

Table 6 shows the ranking of evolution of the position of the provinces with regard to efficiency, calculated as the difference of the position of the province between the two periods of the study. CABA and Córdoba occupied the two first positions in both periods, while Mendoza is the third in the later period, scaling 2 positions. The provinces of Chubut, Santiago del Estero and Tierra del Fuego showed greater relative progress, escalating 16, 8 and 6 places, respectively. At the opposite extreme are Chaco, Río Negro and Santa Cruz, provinces that showed the largest falls in their positions. Buenos Aires, the province with the highest GDP, population and tax revenue, is 16 in the ranking for 2013, rising two positions in relation to 2003, thus showing certain weakness with regard to the efficiency of the public management. CABA, the jurisdiction with highest per capita GDP, was able to maintain its position relative to the other provinces.

Conclusions

The analysis of efficiency in the public expenditure of Argentinean provinces is a key issue when examining the performance of the public sector in the country. An evaluation that would consider only the effectiveness in the attainment of the objectives is unhelpful, since the resources that Governments extract from society and then administer, are essentially scarce resources.

From the analysis conducted in this study, we observe that the provinces as a group increased their efficiency over the period 2003-2013. This phenomenon occurred in parallel with a decline of the standard deviation, which could reflect that government practices are progressively converging.

However there is still a road ahead for provinces to improve efficiency. It is noted that a phenomenon linked to population density may exist, particularly affecting the less populated provinces or those with larger territories, which induces them to increase their spending in order to meet social demands. However, the case of Buenos Aires, which is found to be among the less efficient provinces, should also be further studied in order to elucidate the possibility of existence of diminishing returns to scale after a certain level of aggregate demand for public services.

In general, the results showed that provinces with a greater economic development (Córdoba, CABA, Santa Fe and Mendoza) were among the ones that showed the best relative performances. This provides two possible lines of future research; the first to detect what exogenous factors may be linked to this situation. The literature tends to highlight the gross product, institutions (for example some indicator of the rule of law), population density, or territory features, but others variables could be added, for example the level of transparency of public accounts in these provinces. The second line of research leans towards the detection and assessment of public programs implemented by efficient jurisdictions and the impact that they have had, in order to create a framework of public

policies that potentially may be replicated in other jurisdictions to improve particular situations.

Annex

Below the tables with the Socioeconomic Performance indexes used in the construction of the efficiency frontiers are presented[1].

To evaluate the performance of the public sector it is necessary to have measures that allow knowing the results obtained as a product of the expenditures made in the different components, such as education, health and housing. Below, a series of indicators are shown, that allow the reader to get an overview of the performance of the public sector in each of these areas in the different provinces. For comparative purposes, these are displayed for two periods of time, year 2003 in comparison with year 2013.

Index of socioeconomic performance in Safety. (IDSE – safety)

Provincie	2003	2008
	Crime index	Crime index
Buenos Aires	1,61	1,89
Catamarca	0,88	1,44
Chaco	0,93	1,29
Chubut	1,08	1,20
Córdoba	0,82	0,74
Corrientes	1,08	1,34
Entre Ríos	1,67	1,52
Formosa	1,37	1,48
Jujuy	0,98	0,86
La Pampa	0,83	1,01
La Rioja	1,19	1,56
Mendoza	0,58	0,52
Misiones	1,44	1,61
Neuquén	0,53	0,51
Río Negro	1,07	0,89
Salta	1,22	0,77
San Juan	0,75	0,84
San Luis	1,26	1,02
Santa Cruz	0,71	0,75
Santa Fe	1,07	0,84
Santiago del Estero	1,49	1,62
Tierra del Fuego	1,12	0,95
Tucumán	1,61	1,48

[1] The authors thank M. Cecilia Avramovich and Valentina Bulgarelli, who created and calculated these indexes.

Index of socioeconomic performance in Education. (IDSE – education)

Province	2003									2013								
	Literacy index	Primary Level				Elementary Cicle				Literacy index	Primary Level				Elementary Cicle			
		Grade repetition index	Scholar dropout index	Scholar overage index	Pupil per teacher index	Grade repetition index	Scholar dropout index	Scholar overage index	Students per teacher index		Grade repetition index	Scholar dropout index	Scholar overage index	Students per teacher index	Grade repetition index	Scholar dropout index	Scholar overage index	Students per teacher index
Buenos Aires	1,02	1,44	1,51	1,70	0,90	1,15	1,25	1,49	0,76	1,00	1,16	3,16	1,60	0,65	0,87	1,03	1,06	0,82
CABA	1,03	3,16	0,00	2,38	1,21	1,21	2,47	1,51	1,61	1,01	1,75	2,10	2,11	1,29	1,14	1,59	1,47	1,57
Catamarca	1,01	1,30	0,88	0,91	1,19	2,03	1,29	0,96	1,28	1,00	2,02	1,00	1,08	1,36	1,54	4,09	1,05	1,14
Chaco	0,95	0,89	0,56	0,82	0,80	0,83	0,92	1,17	0,72	1,00	1,09	0,44	0,82	0,91	1,12	0,89	1,16	0,83
Chubut	1,00	1,03	2,42	1,17	0,88	1,26	1,00	0,82	0,72	1,00	2,14	13,30	1,29	1,00	0,81	1,27	0,89	1,38
Córdoba	1,01	1,83	2,69	1,38	0,83	1,08	0,81	0,96	0,84	1,01	1,44	2,32	1,44	0,82	0,93	0,92	1,17	0,89
Corrientes	0,97	0,62	0,46	0,70	1,06	0,80	1,65	0,98	1,44	1,00	0,29	0,44	0,47	0,82	1,39	0,82	0,78	1,16
Entre Ríos	1,00	0,82	1,04	0,94	1,14	0,90	1,00	0,97	0,87	0,99	0,72	1,08	1,02	1,04	0,64	0,81	0,91	0,92
Formosa	0,97	0,69	0,49	0,70	0,89	1,21	0,89	0,81	0,83	0,99	0,92	0,43	0,62	0,96	0,89	0,76	0,86	1,01
Jujuy	0,99	1,31	2,16	1,27	1,10	1,01	0,81	0,86	1,17	1,00	3,65	5,78	1,65	1,24	1,48	0,89	1,27	0,80
La Pampa	1,01	1,40	3,50	1,45	1,26	1,07	1,16	1,30	1,25	1,01	4,35	9,61	1,33	1,23	0,89	1,39	1,03	1,21
La Rioja	1,01	0,92	0,69	0,92	1,02	1,11	0,94	0,88	0,97	1,00	0,80	0,99	0,88	1,27	3,58	1,75	1,00	0,75
Mendoza	1,00	0,98	1,61	1,21	0,89	0,88	1,05	1,20	0,91	1,00	0,75	1,34	1,25	0,94	1,15	0,80	1,22	0,85
Misiones	0,97	0,68	0,37	0,62	0,80	0,92	0,72	0,83	1,10	1,00	0,65	0,34	0,71	0,78	1,34	0,88	0,99	0,66
Neuquén	1,00	1,16	3,31	1,06	1,10	0,73	1,03	0,87	1,31	0,99	0,83	3,00	1,10	1,27	0,61	0,86	0,97	1,30
Río Negro	1,00	1,04	2,16	1,04	1,33	0,73	0,75	0,93	1,05	1,00	2,44	6,98	1,35	1,46	0,86	0,97	1,04	1,67
Salta	0,99	1,09	1,01	0,97	0,90	1,26	1,31	0,90	0,64	1,00	0,81	0,55	0,83	1,05	1,03	1,12	0,92	0,53
San Juan	1,01	0,92	0,59	0,65	0,93	0,99	0,88	0,77	1,15	1,00	0,63	0,70	0,74	0,82	0,71	0,78	0,81	0,93
San Luis	1,01	0,79	0,62	0,83	1,01	1,18	0,95	0,94	1,94	1,00	0,94	0,33	0,77	0,95	1,27	1,12	0,91	1,97
Santa Cruz	1,02	0,66	75,64	1,09	1,27	0,54	0,95	0,95	1,52	1,00	6,69	3,00	1,29	1,05	0,98	1,35	0,86	1,45
Santa Fe	1,01	1,18	1,47	1,17	1,05	1,13	1,32	1,16	0,95	1,00	1,05	0,97	1,26	0,94	0,94	0,76	1,14	0,66
Santiago del Estero	0,97	0,66	0,45	0,74	0,84	1,49	0,53	1,01	0,83	1,00	0,51	0,34	0,61	0,94	1,21	0,64	0,92	2,33
Tierra del Fuego	1,03	2,71	4,01	2,47	1,05	0,82	1,48	1,30	1,21	1,01	1,99	3,00	1,58	1,07	0,82	1,82	0,85	1,90
Tucumán	1,00	1,13	1,40	1,05	1,10	1,54	1,21	1,36	0,85	0,99	2,91	2,16	1,90	1,05	1,08	0,86	1,37	0,85

Index of socioeconomic performance in Health. (IDSE – health)

Province	2003			2013		
	Child mortality index	Gross mortality index	Maternal mortality index	Child mortality index	Gross mortality index	Maternal mortality index
Buenos Aires	1,03	0,77	2,00	0,98	0,80	1,42
CABA	1,63	0,56	7,70	1,21	0,62	2,66
Catamarca	0,84	1,18	0,78	1,11	1,08	2,84
Chaco	1,17	0,79	2,16	0,93	1,01	0,87
Chubut	0,80	1,04	0,56	1,16	1,15	1,06
Córdoba	0,61	1,02	1,04	1,13	0,80	1,85
Corrientes	1,11	1,08	2,34	0,73	0,99	0,57
Entre Ríos	0,98	0,83	1,31	1,17	0,84	1,58
Formosa	0,67	1,12	0,33	0,76	1,06	0,46
Jujuy	0,88	1,16	0,63	0,92	1,09	5,32
La Pampa	1,32	0,88	2,99	1,09	0,85	1,22
La Rioja	0,97	1,18	0,36	0,90	1,13	0,38
Mendoza	1,51	0,92	1,12	1,27	0,92	1,22
Misiones	0,83	1,18	0,79	1,04	1,15	0,91
Neuquén	1,56	1,42	0,93	1,05	1,34	2,37
Río Negro	1,06	1,16	2,99	0,95	1,08	1,29
Salta	0,99	1,20	0,95	0,77	1,13	0,83
San Juan	0,86	0,96	1,54	0,88	0,98	0,79
San Luis	0,97	1,02	2,16	1,26	0,99	1,64
Santa Cruz	1,08	1,20	2,69	1,14	1,43	0,85
Santa Fe	1,21	0,73	1,74	1,10	0,74	1,52
Santiago del Estero	1,18	1,12	0,95	0,94	1,08	1,85
Tierra del Fuego	2,00	1,78	0,64	1,40	1,99	0,36
Tucumán	0,73	1,04	1,54	0,82	1,03	2,50

Index of socioeconomic performance in basic Infrastructure. (IDSE – infrastructure)

Province	2003		2013	
	Housing deficit index	Safe water access index	Housing deficit index	Safe water access index
Buenos Aires	0,04	0,78	0,03	0,84
CABA	0,08	1,02	0,01	1,02
Catamarca	1,57	1,02	0,26	1,03
Chaco	0,69	1,02	3,40	0,96
Chubut	0,90	1,02	0,41	1,03
Córdoba	0,14	1,02	0,11	1,01
Corrientes	0,54	1,02	0,37	1,02
Entre Ríos	0,90	1,02	0,68	1,03
Formosa	3,25	1,02	2,38	1,01
Jujuy	0,70	1,02	1,06	1,00
La Pampa	1,24	0,99	6,08	1,00
La Rioja	0,91	1,02	0,19	1,03
Mendoza	0,26	1,01	0,23	1,03
Misiones	0,84	0,92	0,21	0,96
Neuquén	1,11	1,02	0,43	1,03
Río Negro	3,10	1,01	2,90	1,02
Salta	0,36	1,01	0,30	1,01
San Juan	0,80	1,01	0,13	1,00
San Luis	2,07	1,02	1,13	1,03
Santa Cruz	1,27	1,02	0,60	1,01
Santa Fe	0,18	1,00	0,21	0,96
Santiago del Estero	1,27	1,02	1,45	1,00
Tierra del Fuego	1,50	1,02	1,37	0,97
Tucumán	0,29	1,01	0,06	1,03

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