



FACULTAD
DE CIENCIAS
ECONÓMICAS



Universidad
Nacional
de Córdoba

REPOSITORIO DIGITAL UNIVERSITARIO (RDU-UNC)

Performance of justice in Argentina. AHP ratings model

Miguel Ángel Curchod, Catalina Lucía Alberto

Capítulo del Libro Aplicación de multi-metodologías para la gestión y evaluación de sistemas
sociales y tecnológicos, 1º ed. publicado en 2014 - ISBN 978-987-1436-90-3



Esta obra está bajo una [Licencia Creative Commons Atribución – No Comercial – Sin Obra
Derivada 4.0 Internacional](https://creativecommons.org/licenses/by-nc-nd/4.0/)

PERFORMANCE OF JUSTICE IN ARGENTINA. AHP RATINGS MODEL

MIGUEL ANGEL CURCHOD

CATALINA LUCÍA ALBERTO

Key words: Justice – Evaluation – Analytic Hierarchy Process (AHP) – Ratings.

1. INTRODUCTION

The aim of this study is a comprehensive assessment of the management of the different production units of the Ordinary Justice Administration in Argentina based on different attributes and criteria underpinning production.

This assessment will further allow us to use a ranking method to appraise of the performance of the units analyzed.

This study aims to take a first step towards obtaining a comprehensive picture of the system to serve as guidance to look into other specific aspects in subsequent studies. For this reason, the analysis is carried out in a general way, without either specifying the different matters dealt with the ordinary justice system: criminal, civil, administrative, labor or commercial, nor making a distinction of organs or bodies.

For this evaluation, we propose to use the discrete multicriteria decision method (DMD): Analytic Hierarchy Process (AHP) and specifically within this methodology, the ratings or scoring model.

This approach arises from considering the Data Envelopment Analysis (DEA) as a particular case of DMD techniques (Mackeprang Pérez, 2003). This perspective equates: a) the minimum criteria to inputs, b) the maximum criteria to outputs c) and the alternatives to the decision making units (DMU).

The international literature accessed makes abundant reference to the analysis and evaluation of efficiency in Justice Courts by means of quantitative techniques, mainly in places like the USA, Canada and European countries.

This is not as common in Latin American countries. The works consulted show that the technique generally used in similar cases is Data

Envelopment Analysis, although we found some analysis which used parametric models (Pedraja, F. et al. 1995).

It is also important that, regardless of the techniques used (mathematical programming, parametric methods or multi-criteria decision analysis), the inputs and outputs defined do not differ greatly.

On the other hand, it is important to note that most of the studies carried out the analysis starting from the particular instances, ie focusing the analysis on a specific area (criminal, labor, civil, etc.) or on a particular jurisdiction or on a given instance.

It is stated on the other hand, the basic text of this chapter has been presented in full paper character in the Fourth International Workshop on Knowledge Discovery, Knowledge Management and Decision Support - Eureka-2013-, held in Mazatlan, Mexico. At that time he underwent refereed and accepted by the scientific committee of the event.

2. ADMINISTRATION OF ORDINARY JUSTICE IN ARGENTINA

The justice system in Argentina is composed of the judiciary of the nation and the judiciary of each of the provinces. The Argentine justice system is also integrated by the Public Prosecutor, the Public Ministry of Defense and the Council of the Magistracy.

The organization responds to a federal court of the Argentine State. Thus, there is, on the one hand, a federal court with jurisdiction throughout the country dealing with drugs, smuggling, tax evasion, money laundering, and other crimes that affect the income and security of the Nation. On the other hand, each of the Argentine provinces has a provincial justice in charge of common crimes (also called ordinary courts), with its own procedural law.

Consequently, we can say that the administration of justice in Argentina is built on the basis of two forums: ordinary courts and federal courts. The former are managed and organized by each province according to the autonomy that the Constitution confers. In Argentina, 24 provincial jurisdictions are recognized. The latter, federal courts, are an exception, and they deal with the cases specifically set forth in the Constitution. The territory of the Republic is divided into 17 federal jurisdictions.

The present study was performed on 24 provincial jurisdictions. The purpose is to understand the intrinsic rules of the system operation and therefore to be able to recommend measures to improve their operating efficiency and effectiveness.

3. THE PROBLEM

It is often thought that inefficient provision of public goods and services is an exclusive feature of the Latin American or the Third World Countries. This perspective usually responds to a limited outlook on the variables involved in this problem. Well known authors such as Michel Crozier (1989) can broaden the horizon of analysis. Crozier warns that the crisis in ... " Public Administration is not only French but is universal " ... adding that if you want to understand the reasons for this crisis you must take into account the greater number of needs, the consequent increase of the demands and fewer chances of intervention by the state, noting further that, paradoxically, the greater the degree of freedom of the individuals of a society the greater the need for organization. In this context, the only way to counter the characteristics of this scenario is to achieve an efficient, user-oriented state which provides public goods across the whole society.

That is, modern states face the challenge of providing more and more goods and services, minimizing their costs and maximizing their quality simultaneously. In particular, the provision of the public good "justice" must be endowed with universality, effectiveness and efficiency.

Within this framework, we present an evaluation model that will improve management processes, where system objectives align with available resources and provided inputs relate to the satisfaction of needs.

4. THEORETICAL FRAMEWORK

As we stated in the introduction to this paper, the methodology chosen for the evaluation of the production units of the regular courts in Argentina is the DMD method: Analytic Hierarchy Process.

The methodology chosen, at this early stage of research, is based on the characteristics of the Discrete Multi-Criteria Decision methods (DMD), which facilitate addressing unstructured problems, allowing the construction of an ordered pattern in levels of analysis according to their objectives, attributes, criteria and alternatives.

Furthermore, these models promote communication with the expert panel.

From the standpoint of formal mathematics, DMD issue responds to the following structure:

$$\begin{aligned} \text{Max } F(x) \\ x \in X \end{aligned}$$

where:

x is a vector $[x_1, x_2, x_3, \dots, X_n]$ of the decision alternatives.

X is the feasible region of the problem, or set of all values that can assume the alternatives.

$F(x)$ is the vector $F(x) = [f_1(x), f_2(x), f_3(x), \dots, f_r(x)]$; objective functions that represent the simultaneous goals of the problem.

Analytic Hierarchy Process

The Analytic Hierarchy Process was developed by Professor Thomas Saaty (Saaty, 1980) from the Wharton Business School (USA). AHP is used to structure the problems in different hierarchy levels. These hierarchical levels are set according to the criteria of the person who makes the decisions. This view helps to have an overview of the problem and to establish the relationships between the different factors that make the decision complex, helping the decision making process.

The method (AHP) can be broken down into a series of steps:

1. Performing hierarchical tree diagram of the problem.
2. Developing a binary comparisons matrix between the decision criteria.
3. Using the values to estimate the relative weights of the criteria.
4. Checking the consistency of the decision maker's judgments.
5. Developing binary comparisons matrices of alternatives with respect to each criterion.
6. Using the values to estimate the relative weights of the alternatives for each criterion.
7. Checking the consistency of the decision maker's judgments.
8. Evaluating alternatives globally.

Note that the calculations involved in steps 5, 6 and 7 on the comparison matrix of alternatives for each criterion, are mechanically identical to the calculations performed on the matrix of comparisons between criteria in steps 2, 3 and 4 respectively.

If we notice the repetition of steps, we can see clearly that AHP methodology proposes to order the decision making process which is based mainly on three stages:

- Structuring: by building a hierarchical tree that explains the different elements and levels of the problem.
- Estimating: both through calculation of the vectors and values to determine the priorities of the problem, as well, through the active participation of experts who contribute with their knowledge. This phase also comprises checking the logical consistency of the judgments that determines the consistency of the assessment process.

➤ Analyzing: This phase involves the evaluation and synthesis of the results to recommend intervention measures that contribute to achieving the objectives of the system.

The ratings or scorings model works similarly to traditional AHP. The model combines the ability to structure a problem through hierarchies and criteria, but adding the possibility of considering a significant number of alternatives.

Thomas Saaty suggested that the number of hierarchies and criteria should be limited to nine (9) items for each level, a figure which is determined by the human capacity to consider seven (7) separate units of information simultaneously, plus or minus two (7 +/- 2). The scientific basis of this range was found in studies by psychologist George Miller in 1950.

Traditional AHP model considers a maximum of nine alternatives, and the ratings model solved this problem building a categorical scale or standard, so alternatives are compared against this standard. The mechanism provides the ability to evaluate a lot of alternatives very easily and quickly.

The ratings approach requires selecting *a priori* a categorical scale consisting of several levels or categories represented by a prototype clearly defined for each criterion, and this avoids binary comparisons between alternatives. Imagine that in a decision problem with n alternatives, the number of comparisons would be equal to $[n * (n-1) / 2]$. In a case like this, where $n = 19$, the number of comparisons would be 171 for each criterion.

It should be noted that, the capability to become more familiar with defined categorical scales than with alternatives themselves is as important as the ability to handle a large number of alternatives.

Imagine if we compare only two or three candidates for a job with a carefully defined profile. In this case, it may be more appropriate to compare each alternative with the desired pattern instead of comparing alternatives as does the traditional model.

This involves considering that the use of the scoring model should not be restricted to the case of a large number of alternatives.

In the ratings models, criteria are compared with each other in pairs, but alternatives are compared with respect to the categorical scale. This scale can be defined in quantitative or qualitatively categories. The methodological steps in the ratings model are similar to those in the traditional model of AHP, replacing step 5 (pairwise comparisons with respect to each criterion) by comparisons of each alternative with the standards.

The formal model would be:

$$S_i = \sum_j \bar{w}_j \bar{r}_{ij}$$

Where:

\bar{w}_j = normalized relative weight of the criterion j

\bar{r}_{ij} = normalized rating (alternative i and criterion j)

S_i = score or valuation for the alternative i .

5. APPLICATION

5.1. Structuring Phase

This phase is aimed at understanding the problem through an integrated structure of levels. This requires identifying and clearly specifying the goal to be achieved, listing alternatives, selecting attributes and defining the evaluation criteria (inputs and outputs).

Goal

The goal is to evaluate the different units of the ordinary justice in Argentina. As a result of the evaluation, there arises a score for each alternative. This assessment produces a ranking of the units analyzed according to the criteria that support its management (these ranking problems are known as type problems Γ , Roy 1993).

Definition of Criteria

As mentioned above, the approach taken in this kind of analysis reveals an analogy between DMD techniques and data envelopment analysis (DEA). They are equipped with minimum criteria to inputs, maximum criteria to outputs and alternatives to the processing units.

According to the certified reviewed literature we can observe that, in general, there is consensus on the inputs that must be considered in this type of study. Considering that production manager justice units is a service, then, one can see that the most important input in the production process is labor involved, ie judges, officials and employees.

Regarding the outputs, we include: the population and the rate of resolution of cases.

Thanassoulis (2001) point out the idea that the choice of variables should arise, in most cases, when the factors affecting the performance of the decision making units are identified, which will inevitably be reflected in the data available.

Let us bear in mind the fact that the performance measure of a unit should be a monotone decreasing function of the input, that is, *ceteris*

paribus, the performance measure increases as the input decreases (and viceversa). We can also state this measure should be a monotone increasing function of the output, that is, an increase in an output should bring about, *ceteris paribus*, an increase in the performance measure.

In the case of the chosen output variables –rate of sentence resolution and number of inhabitants– it is necessary to point out that with reference to the “inhabitants” criterion, even when this criterion is not a direct product or service obtained from the inputs, it has been considered an indirect measure of the magnitude of the rendered services. Judges, government officials and judiciary employees must, by constitutional precept, attend to every inhabitant of the Argentine Nation.

Input variables:

- a. Judges (Input 1): number of judges, appellate judges, members and ministers assigned to a jurisdiction.
- b. Officials (Input 2): number of staff (senior employees) assigned to a jurisdiction.
- c. Employees (input 3): people assigned to a jurisdiction operating.

Output variables:

The output variables quantitatively demonstrate the product of different administrative units of service.

In this case we define two outputs:

- a. Sentencing resolution rate (TRS) = (cases resolved / cases filed)

The numerator (cases resolved) indicates the number of cases that were resolved both normally, as well as abnormally during the reporting year. that is, including completions for final judgment and other ways to end the process (ie, mediation settlements, transactions, expirations), etc.

The denominator (cases filed), indicates the number of cases filed for the first time in the court system in the reporting year.

- b. Population: number of people in a particular jurisdiction.

Alternatives

The set of possible alternatives to be evaluated consists of each provincial judiciary established in the area of the Republic and to the Autonomous City of Buenos Aires.

In a comprehensive way: $[J_i \in A; i \in I = \{i / i \in N \wedge 1 \leq n \leq 19\}]$

Where:

A = Set of Alternatives ($J_i = i ; i = 1, 2, \dots, 19$).

Extensively: the study analyzes the judiciary powers of the provinces of Buenos Aires, Catamarca, Chaco, Chubut, Córdoba, Corrientes, Entre Rios, Formosa, La Pampa, La Rioja, Mendoza,

Misiones, Neuquén, Salta, Santa Fe, Santiago del Estero Tierra del Fuego Tucuman¹ and the Autonomous City of Buenos Aires.

In short, the model designed for the evaluation DMD has 5 attributes, 3 inputs (minimization criteria), and 2 outputs (maximization criteria), and 19 alternatives (decision making units) subject to analysis.

The final assessment of each alternative resulting from the aggregation of the rating obtained by each jurisdiction of justice in each criterion is based on $h + k$ attributes associated respectively to two groups of variables, the input variables that represent the resources that each jurisdiction has to manage and output variables that measure the production of each of the jurisdictions.

The data used refer to 2010 and were obtained from published statistics of judiciary branches of the Argentine Provinces and ACBA prepared by the Federal Courts and Superior Courts of the Argentine Provinces and Autonomous City of Buenos Aires.

5.2. Evaluation Phase

At this stage, we worked with experts and data developed by Expert Choice software.

The categorical scale was set at 7 (seven) intervals. For the construction of the intervals we chose equidistant determination.

The methodology used for the investigation was formalized through personal interviews with repetitive questionnaires. During the whole process we formally respected the prospective method Delphi.

Consultations were made both to lawyers, as well as officials directly related to the administration of the justice system. We also consulted professionals as users of these services or for different reasons related to the activity analyzed, thus allowing us to have access to a "social " opinion.

5.3. Analysis and Synthesis Phase

Table N° 1 shows the overall evaluation of the alternatives (Administrative Jurisdictions of Justice) and the position they occupy in the ranking prepared according to the proposed methodology.

¹ Río Negro, San Luis, San Juan, Jujuy and Santa Cruz are not included in the study for lack of data in the publication "Statistics of the judiciary branches in the Argentine Provinces and ACBA", 2010.

Table 1: Overall evaluation of the Administrative Jurisdictions of Justice

ORDER	JURISDICTION OF JUSTICE	$S_i = \sum_j w_j \bar{r}_{ij}$
1	Tierra del Fuego	0,7508
2	Ciudad Autónoma de Buenos Aires	0,6724
3	La Pampa	0,6402
4	La Rioja	0,6191
5	Formosa	0,5832
6	Chubut	0,5821
7	Chaco	0,5435
8	Tucumán	0,5032
9	Entre Ríos	0,5001
10	Santiago del Estero	0,4710
11	Catamarca	0,4609
12	Neuquén	0,4565
13	Santa Fe	0,4338
14	Corrientes	0,4305
15	Salta	0,4148
15	Misiones	0,3904
17	Buenos Aires	0,3542
18	Córdoba	0,1993
19	Mendoza	0,1918

6. CONCLUSIONS

From the results, we highlight the following:

- The AHP ratings model determines, according to the assessment of each alternative, a preorder. In this particular case, the score obtained by each jurisdiction of judiciary administration is not repeated; therefore, we have determined a complete ranking of the evaluated units.
- The value of each decision making unit is determined by the aggregation function of the scorings model, and it should be interpreted as a consistent indicator of management according to the pre-defined criteria.
- The assessed valuation of each unit is an indicator of management from the point of view that it considers multiple criteria.

- The best unit evaluated is the jurisdiction of Tierra del Fuego with a value of 0.7508. The last position in the ranking is occupied by the jurisdiction of Mendoza with a score of 0.1918.

- The variation range is 0.5590. The average value of the aggregation function is 0.4840.

- From all units, 9 are evaluated over the average position (value of 0.4840) and 10 below this value.

- The standard deviation is equal to 0.1446.

- This standard deviation represents significant regional differences.

According to the values obtained by the different jurisdictions it has warned important regional differences.

- Regarding input 1 (magistrates), the jurisdictions of Buenos Aires, Chaco, Chubut, Formosa, Neuquén, Santiago del Estero, Tucumán and Tierra del Fuego get the best rating (0.10) . In this criterion, A.C.B.A. is the jurisdiction that gets the lowest score (0.0091).

- In input 2 (officials), the jurisdictions of Entre Rios, Formosa, La Pampa, La Rioja, Neuquén, Santiago del Estero, Tucumán and Tierra del Fuego get the best score (0,15). In this criterion Buenos Aires is the jurisdiction that gets the lowest score (0.0136).

- Regarding the third criterion of valuation, input 3 (employees), the jurisdictions of Formosa, La Pampa, La Rioja and Tierra del Fuego obtained the best rating (0,25). In this criterion, Buenos Aires is the jurisdiction that gets the lowest score (0.0227).

- It is important to note that small jurisdictions obtain the top position in the inputs (variables to minimize); and, on the other hand, the province of Buenos Aires gets the worst position. This refers to the regional imbalance of Argentina.

- With regard to the first criterion of maximization, output 1 (population), Buenos Aires gets the best position with a value of 0,15. The worst positions are obtained by the provinces of Formosa, La Pampa, La Rioja, Neuquén and Tierra del Fuego with a value of 0.0136. This variable is very important from the point of view that it tells how many people get justice services, but it is an uncontrollable variable, so it is very difficult to change.

- Regarding the second criterion of maximization, output 2, any jurisdiction obtains the maximum grade. The jurisdictions of Cordoba and Mendoza obtain the minimum qualifying missions.

- The range of variation of the aggregation function is (0.0907, 1.0000).

- If the value of the aggregation function is considered a proxy for the management capacity of the units evaluated, then, it can be set within the range of variation, compliance levels, attention or alarm. These intervals may facilitate detection of problems, difficulties or deviations in the system. These intervals automatically would set priorities.

Finally, and as we have already said, this study corresponds to the initial stage of analysis of the ordinary justice system in Argentina. The analysis has led to: a) determining a rating for each jurisdiction of ordinary courts in Argentina, b) ranking according to the performance of each jurisdiction of justice; assigning a preference order or position according to the valuation achieved, c) knowing the relevant variables of the system and its internal operating rules. Despite these achievements, it is considered important to advance in this research studying the efficiency of the different decision making units through specific programming methods such as models of Data Envelopment Analysis.

BIBLIOGRAPHY

- Constitución de la Nación Argentina. (1994) Editorial Espartaco. Argentina ISBN NS 987-98632-3-2.
- Crozier, M. (1989): "Estado Moderno, Estado Modesto". Fondo de Cultura Económica. Méjico.
- Miller, G. (1956): "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information". *The Psychological Review*, vol. 63, pp. 81-97.
- Pedraja F., Salinas, J. (1995): "La Eficiencia en la Administración de Justicia. Las Salas de lo Contencioso de los Tribunales Superiores de Justicia" *Revista de Economía Aplicada* Número 8 (Vol III). Pág. 163 a 195.
- Pérez Mackeprang C. (2003): "DEA como Método de Evaluación Multiatributo Discreta"; XVI ENDIO – XIV EPIO. La Plata (Argentina).
- Roy, B. (1993): "Methodologie Multicritère d'Aide a la Decision". *Económica*. Paris. (Francia).
- Saaty, T. (1980): "The Analytic Hierarchy Process". Mc Graw Hill. New York. (USA).
- Thanassoulis, E. (2001): "Introduction to the theory and application of data envelopment analysis: a foundation text with integrated software. Norwell, Mass. : Kluwer Academic Publishers.
- Yonn, K., Hwang, C.L. (1995): "Multiple Attribute Decision Making: An Introduction". Sage. California, USA.