
Factor Analysis of Organizational Justice: The Case of Ecuador

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Abstract:

Purpose: Organizational Justice (JO) is an important predictor of different attitudes and organizational behavior. The Colquitt organizational scale of justice was developed to assess the perceptions of Justice in employees (for this case university professors) and it has four dimensions: distributive, procedural, interpersonal and informational justice. For this work we extend the analysis to the Ecuadorian context using a model that was applied in Spain.

Design/Methodology/Approach: The Cronbach alpha obtained for each dimension varied between .98 and .99 with a measure of sampling adequacy KMO of .9663. The corresponding factor analysis, includes items on 3 factors that account for 98% of the variance, so it is confirmed that it is an instrument that has the adequate psychometric properties for its use in the ecuadorian context.

Findings: The institutions of public higher education of Ecuador, go through a significant stage of change and transformation from the political to the academic in which short-term changes are proposed regarding the normative and that is where it is necessary to study the processes of organizational change, and achieve greater assimilation through the management of elements such as the perceptions of justice that can lead to these being assimilated in a better way.

Practical Implications: From the four dimensions identified by Colquitt, the one showing a higher percentage of acceptance was the interpersonal with a rate of 86.1%.

Originality/Value: The objective of this study is to assess the scale of organizational Justice of Colquitt and to determine the perception of teachers in public universities in Ecuador. In addition, five questions that refer to the use of ICT in the different dimensions in a sample of 500 professors were included.

Keywords: Justice, Organizational, Colquitt, University, Ecuador.

JEL codes: C16, C50, J20, J30, J70, J80, L20, M12, O15.

Paper type : Research article.

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1. Introduction

The study of organizational justice began with the equity theory of Adams (1963), who is the first author to apply the term to organizational contexts. Organizational justice has been improving significantly in recent years. This justice is a construct introduced by Greenberg (1987) to refer to people's perceptions of equity in organizations. Specifically, we analyze the way in which employees determine if they have been treated fairly in their work and the way in which these determinations influence other variables related to the work.

In the legal field, the term of justice is related to the philosophical sense that is given and is related to three major criteria: common dignity, the common good and the law. The problem in the definition of the concept of justice is that not all authors share the same hierarchy in the criteria to be included (necessity, responsibility, capacity, merit, etc.), so that the variety of concepts of justice prevent us from seeing clearly the reality that is being discussed, hence the importance of defining it contextually (Infante, 2015). In this sense, this type of justice is linked to work as a fundamental human activity, where the employee ensures the necessary resources for their subsistence. At the beginning of the 20th century, with the creation of the International Labor Organization (ILO), a growing concern for social justice begins, understood as justice whose objective is to resolve situations of inequality and exclusion between a social collective and the right of workers. But despite improvements in the conditions of the workers, fundamental issues such as the lack of assessment by employers of the accumulated knowledge of the skills acquired, the lack of the expected social recognition and others have not been addressed.

The conceptualization of organizational justice focuses on how it is perceived by individuals (Greenberg *et al.*, 1991). In the sense of that, understanding justice issues requires an understanding of what people perceive as fair. This descriptive orientation has been of great interest to scientists of many disciplines (Cohen 1986). Some authors (Cohen *et al.*, 2001, Colquitt *et al.*, 2013) analyze findings that relate the perceptions of organizational justice with labor attitudes and the performance of their workers to improve the effectiveness of organizations.

There are many classifications related to the dimensions of organizational justice. Initially focused on distributive justice (JD), which describes the impartiality of the results an employee receives, especially the degree to which the results are fair, in other words, that which is related to the balance that results from the comparison of the own results and contributions with those of other people within the organization (Adams, 1965). In the mid-1970s, some researchers took a step forward in considering procedural justice (JP), which reflects the perceived and impartiality of the decision-making processes and the degree to which they are consistent, accurate and ethical (Leventhal 1980). Subsequently, the concept of interpersonal justice (JINT) was introduced, defined as the interpersonal treatment that people receive as

the procedures are enacted, in other words, it refers to the perception of justice in the treatment received by the manager (Bies, 1986).

Informative justice (JINF) is the perceived adequacy of the explanations given by those responsible for the decision and results processes, as well as the perceived degree of dignity and respect shown by the authorities. It refers, specifically, to explanations and information received by employees in the various events that occur in the organization (Greenberg, 1993).

Various scales of measurement of organizational justice have been developed (Price & Mueller, 1986; Konovsky *et al.*, 1987; Moorman, 1991; Aquino, 1995). Colquitt (2001) explored the theoretical dimensions of organizational justice, based on the four-factor structure suggested by Greenberg (1993), validating a new measure of organizational justice in which he compared multiple factor structures in two independent studies, one in one university and the other in a fieldwork. Thanks to the work of Colquitt (2001), there is a measure of justice composed of a structure of four factors, which led to the establishment of a consensus in Western societies on four large dimensions of perception of justice. However, the Colquitt measure is also present in non-Western societies, showing an average reliability in favor of the four dimensions (distributive, procedural, interpersonal and informative justice).

Although it is observed that research on organizational justice and its relationship with attitudes and values in the company are already present since the end of the 20th century, it is not until the beginning of the 21st century, when they begin to address this issue in Latin America. For this reason also, it is important to mention that a correct administrative management positively affects the perception of organizational justice (Quezada *et al.*, 2019). The results of the most relevant investigations are briefly described below.

Table 1. Results of research on organizational justice

Authors	Resultados de la investigación
González (2003)	He mentions that the role of an administrator is to achieve the cooperation of the organization to seek balance, and this result is achieved when you get to know your workers, which requires the permanent interaction of the team.
Genesi and Suarez (2010)	It is pointed out that quality management in educational organizations regarding human resources in Venezuela is subject to traditional models that control the education of this country.
Münch (2010)	It reflects the relevance of the administration in the sense of generating competitiveness, productivity and maximum quality in companies, emphasizes the relevance of this science before the vertiginous advance of globalization.
Omar (2006)	Organizational justice refers to the perceptions that employers have about what is fair and what is unfair within the organizations to which they belong. Organizational justice sustains its value in terms of whether employees believe that they are being treated

	fairly, that belief will generate positive attitudes in the work with managers and supervisors and the same organization, while if it is shown otherwise, such perception will determine tensions, feelings of dissatisfaction and demotivation, which will leave as a balance limited productivity, decrease in the quality of work and absenteeism.
Omar (2010)	The obtained results indicate that proactive organizational behaviors, of affiliative nature, especially those oriented to render help and to actively involve themselves in the life of the organization, can be considered as a consequence of feeling "fairly" treated within the organization, and that the cultural values associated with collectivism act as a modulating variable of that dispositional relation. Such conclusions, however, must be taken with caution in light of the limitations inherent in the research carried out.
Ortiz (2011)	It concludes that the company under study does not apply an adequate Administrative Management System, which directly harms its organizational structure.
Vaamonde (2013)	When dealing with the variable of organizational justice, it is stated that sexism against women still generate inequalities at work sites all over the world.
Díaz-Gracia <i>et al.</i> (2014)	In his work it is mentioned that the Confirmatory Factor Analysis supported the four-dimensional structure for the Spanish version of the Organizational Justice of Colquitt. The Cronbach's alpha obtained for the sub scales varied between .88 and .95. It is concluded that the Spanish version has adequate psychometric properties and it can be useful in the evaluation of Organizational Justice in the Spanish environment.
Hurtado Morales (2014)	This author concludes that the perception of justice is significantly related to job satisfaction and organizational commitment.
Rodríguez Montalbán <i>et al.</i> (2014)	Para el caso particular de Puerto Rico cuando los trabajadores perciben un ambiente laboral de equidad, su nivel de dedicación es mayor.
Vaamonde and Salessi (2014)	The purpose of his work was to present the main conceptual empirical aspects of organizational justice, its implementation fields, its links with other psychological variables and the most outstanding findings of the investigations carried out in the Argentinean organizational field where it is concluded that justice in the workplace is an essential factor for the harmonious functioning of organizations and for the personal satisfaction of its members. The fair treatment of people at work is important both to improve the effectiveness of performance and a sense of commitment to the organization, as to maintain individual dignity and contribute to the personal fulfillment of workers.
Vásquez, Mejía and Rodríguez (2014)	They point out that a representative 93% of talented young professionals aged 24 to 30 who leave their workplaces do so because they seek an organizational climate with quality of working life and an environment that allows them to be creative and innovate in the way they perform the task; they do this because

	they feel that the human resource in some cases is not rewarded, to which it is added the fact that their perception of work activity does not present better alternatives.
Pedraja-Rejas <i>et al.</i> (2015)	A sample of companies in Chile and Peru confirms the existence of a significant relationship between organizational justice and results related to fair decision-making.
Rodríguez-Montalbán <i>et al.</i> (2015)	The objective of this work was to analyze the psychometric properties of the Colquitt Organizational Justice Scale in a sample of 383 employees from various labor sectors in Puerto Rico. The psychometric properties were analyzed by confirmatory analysis of factors with structural equations. The results indicate that it has a multidimensional structure of four factors (procedural, distributive, interpersonal and informational) with good reliability. It was concluded that it has the adequate psychometric properties for its use in the Puerto Rican organizational context.
Naranjo and Hidrovo (2017)	They point out that employees perceive to be treated in a fair, equitable manner and the presence of favorable working conditions, generating a commitment of continuity at a higher or lower level; Likewise, it is possible to strengthen the affective commitment with the work and the institution, an inference evidenced by the organizational citizenship behavior shown by the collaborators.
Omar <i>et al.</i> (2018)	Organizational justice refers to workers' perceptions of what is fair and unfair in their work. Evidence was presented on the factorial validity and psychometric properties of the Argentine version of the Colquitt Organizational Justice Scale in 406 workers (212 men and 194 women) from Argentinian organizations. The results of the confirmatory factor analysis corroborated the structure of the scale (distributive, procedural, interpersonal and informational justice) indicating that such psychometric characteristics transform the validated scale into a useful tool to measure the perceptions of justice within the Argentinian organizations.

Source: The authors.

One of the great challenges faced by organizations is to have collaborators motivated to carry out their work duties. The motivation arises from the presence of the following factors: type of leadership, work environment, organizational culture, career growth opportunities, economic and social benefits among others. However, there are events that affect their motivation and the result is labour and personal dissatisfaction, poor performance, low productivity, staff turnover, etc.

With this background, interest was raised to carry out this research which objectives are to determine the perception of organizational justice in the professors of the public universities of Ecuador and validate the Colquitt scale in its four dimensions: distributive, procedural, interpersonal and informative justice. First, this introduction is presented; second, the methodology used for the investigation is exposed, where the technique used to carry out the data collection, the applied processes for the analysis of the data, the population under study and the questionnaire used are

specified; third, the results, analysis and interpretation of the information are presented; finally, the conclusions and bibliographical references are shown.

2. Econometric Approach and Data

The concept of organizational justice has been incorporated in several areas. Colquitt conducted studies to know the theoretical dimensions of this construct and its reliability. The organizational justice scale of Colquitt was designed to know the perception of justice that people have, but in the present study it will be applied to samples of professors of public universities of Ecuador in its four dimensions: distributive, procedural, interpersonal and informative.

The scale contains 20 items with Likert type responses of five points with options for each of the five sections (1 = Strongly disagree, 2 = Disagree, 3 = Indifferent, 4 = Agree and 5 = Strongly agree). In addition, the items were modified in their dialect to adjust them to the Ecuadorian culture.

It is important to mention that in this work we have included 5 questions regarding ICT. According to Quezada *et al.* (2018), the use of these technologies is giving rise to deep social transformations and, thanks to their applications as an element of access and exchange of information, the members of the different organizations express ideas, criteria, feelings and, ultimately, proposals that along with the collective effort, improve the work scenarios in a considerably way. These information technologies have a transversal tool character and social democratization, since they can provide endless opportunities in improving the growth and sustainable development of the organization, leading to a reduction of the existing gap between included and excluded. That is why it was considered convenient to include these questions in our questionnaire, to see to what extent teachers perceived the use of these technologies as an instrument to improve organizational justice.

In total there are 25 questions distributed as follows: Distributive justice with 5 questions; Procedural justice with 9 questions; Interpersonal Justice with 5 questions; Informative justice with 6 questions.

Table 2. Survey applied to professors of the public universities of Ecuador⁵

Dimensions	Questions
Distributive Justice [DJ]	Q1 Do your rewards reflect the effort you put into your work?
	Q2 Are your rewards appropriate for the job you have completed?
	Q3 Do your rewards reflect that you have contributed to the organization?

⁵ The questions P5, P13, P14, P19 and P25 are the additional questions asked in the survey, in order to know the use given to ICT for the improvement of the different types of justice analyzed.

	Q4 Are your rewards fair considering your performance?
	Q5 Has the management team favored the use of ICT as a means of informing the effort, results and rewards?
Procedural justice [PJ]	Q6 Have you been able to express your views and feelings about the procedures used to give rewards?
	Q7 Have you had any influence on the rewards obtained from these procedures?
	Q8 Are the procedures for giving rewards consistently applied (in the same way to all employees)?
	Q9 Have the procedures for giving rewards been applied in a neutral manner (without prejudice)?
	Q10 Have the procedures for giving rewards been based on accurate information?
	Q11 Have you been able to apply for the work rewards that you deserve according to these procedures?
	Q12 Have the procedures for giving rewards been based on ethical and moral standards?
	Q13 Has the management team promoted the use of ICT to facilitate the procedures used to give rewards and information related to these rewards?
	Q14 Has the management team favored the use of ICT as a means of reflection and debate about such procedures?
	Interpersonal Justice [INTJ]
Q16 Has the management team treated you with dignity?	
Q17 Has the management team treated you with respect?	
Q18 Has the management team avoided inappropriate jokes or comments?	
Q19 Has the management team promoted the use of ICT to facilitate relations between staff in an environment of trust and respect?	
Justicia informativa [JINF]	Q20 Has the management team been sincere in communicating with you?
	Q21 Has the management team explained in detail the procedures you will use to reward your work?
	Q22 Have the explanations of the management team, with respect to the procedures for rewarding you, been reasonable?
	Q23 Has the management team communicated details related to your work in a timely manner?
	Q24 Does the management team take into account the specific needs of employees to communicate with them?
	Q25 Has the management team favored the use of ICT as a key communication factor in labor relations?

Source: The authors.

The research is of qualitative and quantitative type that measures the variables of organizational justice through a sampling procedure. To obtain the information, measurement tools were used for each of the variables; these were applied to 500 professors from 31 public universities in Ecuador in the first quarter of 2019 (Table 3).

Table 3. List of Ecuadorian public universities that have participated in the survey

Universities in the Coast Region	12. Universidad Técnica de Machala	22. Universidad Nacional de Educación
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1. Universidad de Guayaquil	13. Universidad Técnica Estatal de Quevedo	23. Universidad Politécnica Estatal del Carchi
2. Escuela Superior Politécnica Agropecuaria de Manabí	14. Universidad Técnica Estatal Luis Vargas Torres	24. Universidad Técnica de Ambato
3. Escuela Superior Politécnica del Litoral	Universities in the Highland Region	25. Universidad Técnica de Cotopaxi
4. Universidad Agraria del Ecuador	15. Escuela Politécnica Nacional	26. Universidad Nacional de Chimborazo
5. Universidad de las Artes	16. Escuela Politécnica de Chimborazo	27. Universidad Nacional de Loja
6. Universidad Estatal de Milagro	17. Instituto de Altos Estudios Nacionales	28. Universidad Técnica del Norte
7. Universidad Estatal del Sur de Manabí	18. Universidad Central del Ecuador	29. Universidad Yachay Tech
8. Universidad Laica Eloy Alfaro de Manabí	19. Escuela Superior Politécnica del Ejército	Universities in the Amazon Region
9. Universidad Técnica de Manabí	20. Universidad Estatal de Bolívar	30. Universidad Estatal Amazónica
10. Universidad Estatal Península de Santa Elena	21. Universidad de Cuenca	31. Universidad Regional Amazónica IKIAM
11. Universidad Técnica de Babahoyo		

Source: The authors.

Participants answered on a Likert scale of five anchors, with a total of 25 items. The items evaluated did not present lost values, that is, there were no empty items or cells (no response), therefore, it can be confirmed that 100% of the data are valid.

2.1 Instrument and Measurement

The analysis and interpretation of reliability of the organizational justice questionnaire was carried out using the Cronbach's alpha⁶, which measures the validity and reliability of the instrument, and evaluates the degree of homogeneity of the items. From the probabilistic point of view, this coefficient allows to quantify the level of reliability (which in turn allows us to identify the reliability of them) of a scale of measurement, in our case a Likert scale, for the magnitude of interest that it can not be verified directly. This scale is prepared based on the total data contained in the items analyzed, which shows us information similar to what we would obtain by calculating the weighted average of the correlations between the items that are part of the scale.

Cronbach's alpha has been calculated from the variances, according to the relationship:

⁶The Cronbach's alpha is a mean of the correlations between the variables that are part of the scale. It can be calculated in two ways: from the variances (Cronbach's alpha) or from the item correlations (Cronbach's standardized alpha).

$$\alpha = \left(\frac{k}{k-1} \right) \left[1 - \frac{\sum_{i=1}^k S_i^2}{S_t^2} \right]$$

Taking into account that:

S_i^2 = Variance of each item;

S_t^2 = Variance of the total values considered;

k = Number of items.

In case of obtaining an index value of Cronbach's alpha close to 1, it is concluded that the reliability of the scale instrument is significant. It is necessary to emphasize that it is accepted if values of Cronbach's alpha higher than 0.7 are reached, and the reliability of the scale is relevant (Christmann & Van Aelst, 2006).

Table 4. Description of the formula of the Cronbach's Alpha coefficient

Elements	Meaning and explanation of the operation
K	Number of coded items.
K-1	Number of coded items minus 1.
Var-items	Total addition of the variance of each one of the items.
Var test	Variance of the total addition of the coding of each one of the items
Num.	Division of the number of items on number of items minus 1.
Reason	Division of the Var items on the Var test.
1 Minus	Difference of Reason - 1
Alpha of Cronbach	Multiplication of the result of the Num for the result of 1 Less.

Source: The authors.

In the research carried out by Ruiz (2003) he considers that Cronbach's alpha is adequate when it is higher than 0.80 with "high" interpretation; however, there is no fixed address in all cases, since it depends on the type of instrument used and its purpose. The literature indicates that in the tests of academic nature the coefficients are in a range of 0.61 to 0.80. Consequently, a suitable instrument guarantees a high reliability.

Table 5. Interpretation of the Cronbach's Alpha coefficient

Coefficient	Interpretation
Coefficient alfa – 0.81 to 1.00	Very high
Coefficient alfa – 0.61 to 0.80	High
Coefficient alfa – 0.41 to 0.60	Moderate
Coefficient alfa – 0.21 to 0.40	Low
Coefficient alfa – 0.01 to 0.20	Very low

Source: Ruiz (2003).

In the factorial analysis, many variables that have answers to items (25) our survey contains are being analyzed, where it is attempted to identify the number and

composition of the common factors necessary to explain the common variance of the set of items analyzed. Several authors such as Fabrigar *et al.* (1999), Ferrando and Anguiano-Carrasco (2010) indicate that when using this methodology, three items should be selected by factor as a minimum, only if a minimum of 200 cases are available, but in our case there is a sample of 500 responses, therefore, it is feasible to use this statistical technique, where three factors are obtained as follows:

$$\begin{aligned} X_1 &= v_{1(1)} F_{(1)} + v_{1(2)} F_2 + \dots + v_{1(m)} F_{(m)} + e_1 \\ X_2 &= v_{2(1)} F_{(1)} + v_{2(2)} F_2 + \dots + v_{2(m)} F_{(m)} + e_2 \\ X_p &= v_{p(1)} F_{(1)} + v_{p(2)} F_2 + \dots + v_{p(m)} F_{(m)} + e_p \end{aligned}$$

where X_j , F_i and e_j contain the score of a person in item X_j , the common factor F_i and the specific factor e_j , m is the number of common factors, p is the number of items, F is a common factor, $v_{j(i)}$ is the weight of the i th common factor associated to the observed i th variable or item, $i = 1, 2, \dots, m$; $j = 1, 2, \dots, p$; e_j is a single factor, $j = 1, 2, \dots, p$.

For the adequacy of the data for the corresponding analysis, we evaluate this aspect through the calculation of the Kaiser-Meyer-Olkin (KMO) measure of Kaiser (1958), index that indicates how appropriate is to apply Factor Analysis, in other words, serves to compare the magnitudes of the correlation coefficients. Values between 0.5 and 1 indicate that it is appropriate to apply it. KMO reflects the influence of all factors; size of the correlations between the items, sample size, number of factors and number of items. This adequacy measure indicates how large the correlation between the measured variables is.

Lloret-Segura *et al.* (2014) indicate in their work that, if the correlations are sufficiently large, the matrix is considered adequate for its factorization because it will offer stable results, replicable in other different samples, regardless of the size of the sample, the number of factors, or the number of items. If the sum of the squared correlation coefficients among all pairs of variables is low compared to the sum of squared correlation coefficients, then the KMO index will be close to one and this will be considered positive and will indicate that the factor analysis can be continued. But if low values are obtained with the KMO index, then it indicates that the correlations between pairs of variables can not be explained by the other variables and, therefore, it is not feasible to carry out the factorial analysis since the KMO index will move away of zero.

$$KMO = \frac{\sum \sum_{j \neq k} r_{jk}^2}{\sum \sum_{j \neq k} r_{jk}^2 + \sum \sum_{j \neq k} a_{jk}^2}$$

where r, j, k measure the simple linear correlation between the observed variables j and k and a, j, k is the partial correlation coefficient between j and k . What this index tries to measure is that there is a strong simple correlation between the variables, by itself, and that in addition the correlation effect between two variables is not due to the rest of the other variables, which is precisely the coefficient of partial correlation. That is, the ideal situation is that this last coefficient does not disturb the linear coefficients, so that a KMO index close to 1 is optimal. It is commonly accepted that if $KMO < 0.5$ would not be acceptable for factor analysis; if $0.5 < KMO < 0.6$ degree of mean correlation, there would already be average acceptance in the results of the factorial analysis; if $KMO > 0.7$ indicates a high correlation and, therefore, the factorial analysis is convenient.

To check if the correlation matrix has intercorrelations between the items, Bartlett's sphericity test is used, which consists of a chi-square estimate from a transformation of the determinant of the correlation matrix. Bartlett's sphericity test evaluates the applicability of the factorial analysis of the items studied. We accept the model when its significance (p-value) is less than 0.05 and therefore the factor analysis can be applied; we refuse to continue with the factorial analysis when its significance (p-value) is greater than 0.05, therefore, the factorial analysis cannot be applied.

The Bartlett test is used to test the null hypothesis, where all the variances of a population k are equal, as opposed to the alternative hypothesis that at least two are different.

$$X^2 = \frac{(N - K) \ln(S_p^2) - \sum_{i=1}^k (n_i - 1) \ln(S_p^2)}{1 + \frac{1}{3(k - 1)} \left(\sum_{i=1}^k \left(\frac{1}{n_i - 1} \right) - \frac{1}{N - k} \right)}$$

2.2 Population and Sample

The population under study is the faculty of the 31 public universities of Ecuador. The census, according to the Secretariat of Higher Education, Science and Technology of Ecuador (SENESCYT) is 22,305 teachers. With a margin of error of 5%, a confidence level of 95%, according to the statistical equation for population proportions, a sample of 378 surveys is estimated to be carried out to the teaching staff of the public universities of Ecuador, but in our study they were taken in consideration 500 surveys, of which 48.8% were men, 50.2% women and 1% prefer not to say it. This implies that it is a valid and representative sample, since these data improve the confidence level of the results, since in statistics it is considered that the only way to reduce the admissible error is to increase the sample size.

The data is categorized according to a Likert scale, and due to this particularity it is advisable to use the modal values to characterize the results. The contrast with this information is made with the medians, in order to visualize if there is a well-marked central tendency in which the modal value and the median coincide. Finally, a

weighting is performed based on the standard deviations in ascending order, given that the smaller the standard deviation is, the smaller the difference between the data collected from the sample and its central tendency is, therefore, more accurate. These analyzes were carried out with the statistical program Stata14.

3. Empirical Analysis

3.1 Determination of Descriptive Statistics and Cronbach's Alpha

From the data collected it can be determined that 48.8% of the people surveyed were men, 50.2% women and 1% prefer not to answer. We can deduce that there was gender equity at the time of responding to the surveys, so there is no bias in this regard.

Table 6. Summary table of people surveyed

Gender	Frequency	Percentage	Accrued percentage
Man	244	48.8	48.8
Woman	251	50.2	99
Prefers not to say	5	1.0	100
TOTAL	500	100	

Source: The authors.

In order to determine the reliability of the data collected for the analysis of the items, carried out an analysis of Cronbach's Alpha to validate and evaluate the reliability of the measuring instrument used and its data. With 25 items evaluated in 500 sample elements, the result of Cronbach's alpha was 0.9962, which indicates a high confidence in the data collected for the present investigation (Table 7).

Table 7. Summary table of perception of organizational justice

Dimensions	Questions	N		Mean	Median and Mode	Variance	Standard deviation	Alpha of Cronbach
		Valid	Lost					
Distributive Justice [DJ]	Q1 Do your rewards reflect the effort you put into your work?	500	0	3.59	4	1.58	1.26	0.9921 5 Items
	Q2 Are your rewards appropriate for the job you have completed?	500	0	3.57	4	1.49	1.22	
	Q3 Do your rewards reflect that you have contributed to the organization?	500	0	3.72	4	1.44	1.20	
	Q4 Are your rewards fair considering your	500	0	3.47	4	1.59	1.26	

	performance?							
	Q5 Has the management team favored the use of ICT as a means of informing the effort, results and rewards?	500	0	3.63	4	1.32	1.15	
Procedural Justice [PJ]	Q6 Have you been able to express your views and feelings about the procedures used to give rewards?	500	0	3.41	4	1.35	1.16	0.9949 Items
	Q7 Have you had any influence on the rewards obtained from these procedures?	500	0	2.94	3	1.42	1.19	
	Q8 Are the procedures for giving rewards consistently applied (in the same way to all employees)?	500	0	3.09	3	1.66	1.29	
	Q9 Have the procedures for giving rewards been applied in a neutral manner (without prejudice)?	500	0	3.12	3	1.66	1.29	
	Q10 Have the procedures for giving rewards been based on accurate information?	500	0	3.20	3	1.49	1.22	
	Q11 Have you been able to apply for the work rewards that you deserve according to these procedures?	500	0	3.11	3	1.42	1.19	
	Q12 Have the procedures for giving rewards been based on ethical and moral standards?	500	0	3.29	4	1.54	1.24	
	Q13 Has the management team promoted the use of ICT to facilitate the procedures used to reward information related to these rewards?	500	0	3.36	4	1.30	1.14	
	Q14 Has the management team favored the use of ICT as a means of reflection and debate about such procedures?	500	0	3.31	4	1.37	1.17	
Justicia interpersonal [JINT]	Q15 Has the management team treated you with courtesy?	500	0	4.36	5	0.96	0.98	0.98235 Items
	Q16 Has the management team treated you with dignity?	500	0	4.34	5	0.98	0.99	
	Q17 Has the management team treated you with respect?	500	0	4.39	5	0.85	0.92	
	Q18 Has the management team avoided inappropriate jokes or comments?	500	0	4.13	4	1.25	1.12	
	Q19 Has the management team promoted the use of ICT to facilitate relations between	500	0	3.87	4	1.44	1.20	

	staff in an environment of trust and respect?							
Justicia informativa [JINF]	Q20 Has the management team been sincere in communicating with you?	500	0	3.98	4	1.39	1.18	0.9924 6 Ítems
	Q21 Has the management team explained in detail the procedures you will use to reward your work?	500	0	3.59	4	1.77	1.33	
	Q22 Have the explanations of the management team, with respect to the procedures for rewarding you, been reasonable?	500	0	3.58	4	1.69	1.30	
	Q23 Has the management team communicated details related to your work in a timely manner?	500	0	3.77	4	1.51	1.23	
	Q24 Does the management team take into account the specific needs of employees to communicate with them?	500	0	3.69	4	1.59	1.26	
	Q25 Has the management team favored the use of ICT as a key communication factor in labor relations?	500	0	3.76	4	1.46	1.21	
	Total Items	25		Total Alpha of Cronbach				0,9962

Source: The authors.

In Table 7 it can be seen that the descriptive statistics of the survey were obtained, such as the mean, median, mode, variance and standard deviation. The average is the average of the data, which is the sum of all the observations divided by the number of observations, therefore we can see that the values of the mean are above their average in all the questions and it is identified that the style of organizational justice in public universities in Ecuador is interpersonal justice, which shows that respondents have a greater perception of this type of justice, followed by informative, distributive and finally procedural justice.

The values of median and mode as can be seen in Table 7, are the same in each of the 25 items. The median is the midpoint of the data set in which half of the observations is above the value and the other half is below the value. The median is determined by ranking the observations, while the mode is the value that occurs most frequently in a set of observations.

In general, by analyzing each of the dimensions in Table 7, teachers have an acceptable perception of the distributive dimension, so the rewards reflect the effort they have put into their work, which are appropriate considering their performance. The senior management team has favored the use of ICT as a means of informing the effort, the results and the rewards.

In procedural justice the values of 9 items of fashion, two have a value of 4 (agreed) and seven items a value of 3 (indecisive). This indicates that the respondents in the questions whose fashion value is 4 (agree) have an acceptable perception with respect to expressing their views and feelings about the procedures used to give rewards and that these have been based on ethical and moral standards. In addition, the management team has promoted the use of ICT to facilitate the procedures used to provide information related to these rewards, as a means of reflection and debate about these procedures. The seven items that have a fashionable value of 3 (indecisive), reflect an unclear perception about the influence, fairness, impartiality, veracity and merits on the rewards obtained from these procedures.

In the dimension of interpersonal justice we see in the five items a fashion value of 4 (agreed) and 5 (totally agree), which indicates that the perception is very good in relation to the good treatment received by the management team, either personally or through ICT, not only in terms of education, dignity and respect, but also avoiding inappropriate comments. Informative justice has a fashion value of 4 (agreed). This dimension indicates a good perception of the message received, in terms of sincerity, detail and analysis of the specific information needs that university staff may have, as well as, in the use of ICT as a key factor of communication in labor relationships.

The variance measures how scattered the data is about its mean. The variance is equal to the standard deviation squared. The greater the variance, the greater the dispersion of the data. The standard deviation uses the same units as the data and tells us how scattered the data is about the mean. As we can see in Table 7, the least scattered data are found in interpersonal justice.

3.2 Pearson Correlation Determination

Ruiz (2007) mentions that the Pearson correlation is a statistical index that measures the relationship between two variables in a quantitative way. If $r = 0$ the variables have no correlation, since a relation is not established. The correlation value close to 1 means that it has a positive relationship between two variables. If $r = 1$ the variables have a perfect positive correlation. The value of the correlation close to -1 means that there is a negative linear relationship between the two variables. If $r = -1$, the variables have a perfect negative correlation.

Table 8. *Pearson correlation in the Distributive Justice dimension*

Dimension	Q	Data	Q1	Q2	Q3	Q4	Q5
Distributive Justice	Q1	Correlation of Pearson	1.00				
		Sig					
		N	500				
	Q2	Correlation of Pearson	0.9862*	1.00			
		Sig	0.0000				

	N	500	500	500	500	500	500	500	500	500	
Q14	Correlation of Pearson	0.9596*	0.9167*	0.9454*	0.9518*	0.9679*	0.9422*	0.9800*	0.9833*	1.00	
	Sig	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
	N	500	500	500	500	500	500	500	500		

Source: The authors *, Significant correlation at the 0.05 level.

Table 10. Pearson correlation in the Interpersonal Justice dimension

Dimension	Q	Data	Q15	Q16	Q17	Q18	Q19
Interpersonal Justice	Q15	q	1.00				
		Sig					
		N	500				
	Q16	Correlation of Pearson	0.9797*	1.00			
		Sig	0.0000				
		N	500	500			
	Q17	Correlation of Pearson	0.9875*	0.9765*	1.00		
		Sig	0.0000	0.0000			
		N	500	500	500		
	Q18	Correlation of Pearson	0.9259*	0.9348*	0.9221*	1.00	
		Sig	0.0000	0.0000	0.0000		
		N	500	500	500	500	
	Q19	Correlation of Pearson	0.8828*	0.8907*	0.8865*	0.9306*	1.00
		Sig	0.0000	0.0000	0.0000	0.0000	
		N	500	500	500	500	500

Source: The authors *, Significant correlation at the 0.05 level.

Table 11. Pearson correlation in the Information Justice dimension

Dimension	Q	Data	Q20	Q21	Q22	Q23	Q24	Q25
Informative Justice	Q20	Correlation of Pearson	1.00					
		Sig						
		N	500					
	Q21	Correlation of Pearson	0.9273*	1.00				
		Sig	0.0000					
		N	500	500				
	Q22	Correlation of Pearson	0.9268*	0.9836*	1.00			
		Sig	0.0000	0.0000				
		N	500	500	500			
	Q23	Correlation of Pearson	0.9443*	0.9594*	0.9545*	1.00		
		Sig	0.0000	0.0000	0.0000			

		N	500	500	500	500		
Q24	Correlation of Pearson		0.9324*	0.9649*	0.9725*	0.9758*	1.00	
	Sig		0.0000	0.0000	0.0000	0.0000		
	N		500	500	500	500	500	
Q25	Correlation of Pearson		0.9415*	0.9613*	0.9559*	0.9821*	0.9775*	1.00
	Sig		0.0000	0.0000	0.0000	0.0000	0.0000	
	N		500	500	500	500	500	500

Source: The authors *, Significant correlation at the 0.05 level.

According to the results obtained in Tables 8, 9, 10 and 11, the correlations at the 0.05 level are determined in each of the dimensions, which indicates that they are reliable and statistically significant coefficients. Each of the four dimensions has a value greater than 0.90 ($0 < r < 1$) which indicates a positive correlation, that is, a strong linear relationship between the variables.

3.3 Determination of Factorial Analysis

Analyzed the determination of reliability of each of the dimensions, we used the statistical technique called Factorial Analysis. This is one of the most applied techniques in studies related to the development and validation of items (25) to explore the set of common items or factors that explain part of the variability found in the population under study.

Table 12. Summary Table of Exploratory Factor Analysis

Dimensiones	Questions	Factor 1	Factor 2	Factor 3
Distributive Justice [JD]	Q1 Do your rewards reflect the effort you put into your work?	0.5649	0.4526	0.6656
	Q2 Are your rewards appropriate for the job you have completed?	0.5742	0.4521	0.6539
	Q3 Do your rewards reflect that you have contributed to the organization?	0.5160	0.4647	0.6999
	Q4 Are your rewards fair considering your performance?	0.6315	0.4663	0.5770
	Q5 Has the management team favored the use of ICT as a means of informing the effort, results and rewards?	0.5612	0.4865	0.6330
Procedural Justice [JP]	Q6 Have you been able to express your views and feelings about the procedures used to give rewards?	0.6631	0.4959	0.5039
	Q7 Have you had any influence on the rewards obtained from these procedures?	0.7370	0.4297	0.4453
	Q8 Are the procedures for giving rewards consistently applied (in the same way to all employees)?	0.7797	0.3997	0.4484

	Q9 Have the procedures for giving rewards been applied in a neutral manner (without prejudice)?	0.7857	0.4104	0.4349
	Q10 Have the procedures for giving rewards been based on accurate information?	0.7712	0.4388	0.4302
	Q11 Have you been able to apply for the work rewards that you deserve according to these procedures?	0.7618	0.4316	0.4349
	Q12 Have the procedures for giving rewards been based on ethical and moral standards?	0.7336	0.4624	0.4579
	Q13 Has the management team promoted the use of ICT to facilitate the procedures used to reward information related to these rewards?	0.7095	0.4965	0.4472
	Q14 Has the management team favored the use of ICT as a means of reflection and debate about such procedures?	0.7342	0.4768	0.4439
Interpersonal Justice [JINT]	Q15 Has the management team treated you in an educated manner?	0.4070	0.8210	0.3745
	Q16 Has the management team treated you with dignity?	0.4112	0.8087	0.3837
	Q17 Has the management team treated you with respect?	0.4043	0.8165	0.3821
	Q18 Has the management team avoided inappropriate jokes or comments?	0.4945	0.7045	0.4335
	Q19 Has the management team promoted the use of ICT to facilitate relations between staff in an environment of trust and respect?	0.5314	0.6046	0.5970
Informative Justice [JINF]	Q20 Has the management team been sincere in communicating with you?	0.5157	0.6069	0.5451
	Q21 Has the management team explained in detail the procedures you will use to reward your work?	0.6033	0.4862	0.5995
	Q22 Have the explanations of the management team, with respect to the procedures for rewarding you, been reasonable?	0.5918	0.4994	0.6013
	Q23 Has the management team communicated details related to your work in a timely manner?	0.5180	0.5020	0.6778
	Q24 Does the management team take into account the specific needs of employees to communicate with them?	0.5411	0.4895	0.6665
	Q25 Has the management team favored the use of ICT as a key communication factor in labor relations?	0.5347	0.5080	0.6513
		Variance by factor	9.4284	7.3070
	% Accumulated variance by factors	0.3854	0.6840	0.9800
	Total% Var	98%		

Barlett's sphericity test: Chi-square	38693.38
Barlett's sphericity test: Degrees of freedom	300
Barlett's sphericity test: Significance	0.000
Sampling adaptation measure Kaiser-Meyer-Olkin (KMO)	0.9663

Source: The authors.

The selection of the factors to be extracted is derived from the sedimentation figure obtained from the statistical program Stata14, in which the factors whose own values are greater than 1 are chosen. In the analysis, three factors are extracted, which comply with the indicated requirement.

The variance by factor explains in more detail the selection of the three main components. As can be seen in Table 12, these three factors together explain 98% of the variance, this means that with these three factors can represent 98% of the original problem, resulting in the loss of only 2% of the the original information represented by the 25 variables.

The Chi-square estimation from a transformation of the determinant of the correlation matrix that analyzes the Bartlett sphericity test, presents a value (significance) of 0.000, which indicates that the data matrix is valid to continue with factor analysis (Table 12). The matrix of data that we are analyzing (Table 12) obtained a KMO of 0.9663, which indicates that the sample taken for the study is appropriate and therefore the application of the Factorial Analysis can be continued. With these two results of the analyzes carried out, the sphericity test of Barlett and the determination of KMO, can be checked and it can be indicated that they satisfactorily exceed the found values, therefore, there is relevance and validity of the data matrix to perform Factorial Analysis.

The results of Table 12 contain the load of the factors, that is, the correlation between each variable and this factor. The loads indicate the degree of correspondence between the item and the factor, that is, high loads indicate that said item is representative for said factor. For example, we can see that, in the dimension of interpersonal justice, question 15 that indicates whether "the management team has treated you in an educated manner", is attributable to factor 2, because it has a greater burden (0.8210).

In Table 12, it is also observed that the first factor is composed of eleven (11) items, while the second factor is composed of five (6) items, and the third factor is nine (9) items. With these results it is observed that the first and third factors tend to group a significant number of items, while the second factor groups a smaller number. However, the charges are clear, taking the highest value per factor for each item. In many cases it is possible to find variables with ambiguity in terms of belonging to one factor or another, since their factorial load can be greater than 0.5 in several

factors. However, when in the original structure of Colquitt (2001), an item has factorial load in two dimensions and its difference is less than 0.15, it can be located where it is most convenient. In the results of Table 12, a varimax rotation was performed on the data and using the influences of the rotated factors, the factors can be interpreted as follows:

In the dimension of procedural justice, question 9 that indicates whether "the procedures for giving rewards have been applied in a neutral manner (without prejudice)" (0.7857) has a large positive influence on factor 1, but it should be emphasized that nine questions of this dimension have a significant result, so we can indicate that this factor describes procedural justice with a great influence for organizational justice in Ecuadorian university professors.

In the dimension of interpersonal justice, question 15 that indicates whether "the management team has treated you in an educated manner" (0.8210) has a large positive influence on factor 2, but it should be mentioned that out of five questions of this dimension four questions have a significant result, so we can indicate that this factor describes interpersonal justice with a great influence for organizational justice in Ecuadorian university professors.

In the dimension of distributive justice, question 3 that indicates if "your rewards reflect that you have contributed to the organization" (0.6999) has a positive influence on factor 3, but it should be noted that out of five questions of this dimension four questions have a significant result and from the dimension of informative justice, six questions, four of them have a significant result, so we can indicate that this factor describes the distributive and informative justice with a great influence for the organizational justice in the Ecuadorian university professors.

Table 13 shows the load matrix of rotated factors (applying varimax). With these data, the three different factors that have their respective items are grouped as we will see below:

Table 13. Resulting items for each factor.

Dimensions	Factor 1	Factor 2	Factor 3
Distributive Justice [DJ]			Q1
			Q2
			Q3
	Q4		
			Q5
Procedural Justice [PJ]	Q6		
	Q7		
	Q8		
	Q9		
	Q10		
	Q11		
	Q12		

	Q13		
	Q14		
Interpersonal justice [JINT]		Q15	
		Q16	
		Q17	
		Q18	
		Q19	
Justicia informativa [JINF]		Q20	
	Q21		
			Q22
			Q23
			Q24
			Q25

Source: The authors.

In this way the original 25 items have been reduced to three (3) factors, distributive, procedural and interpersonal justice, which represent three blocks for the analysis of the perception that professors of public universities in Ecuador have.

Below, the results obtained from each of the 25 items questioned to 500 professors of the public universities of Ecuador are detailed, where the total of the survey was analyzed, emphasizing that the analysis was carried out in both men and women, giving an approximate result, as shown in the following Tables, so there is no incidence in the answers considering gender.

The following Tables 14-39 present the results for the 25 items:

Q1	Frequency	Percentage	Valid percentage	Accrued percentage		Q2	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	128	25,6	25,60	25,6		Totally agree	116	23,2	23,2	23,2
Agree	205	41	41,0	66,6		Agree	213	42,6	42,6	65,8
Undecided	45	9	9,0	75,6		Undecided	51	10,2	10,2	76
Disagree	80	16	16,0	91,6		Disagree	82	16,4	16,4	92,4
Totally Disagree	42	8,4	8,4	100		Totally Disagree	38	7,6	7,6	100
Total	500	100	100			Total	500	100	100	

Q3	Frequency	Percentage	Valid percentage	Accrued percentage		Q4	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	149	29,8	29,8	29,8		Totally agree	114	22,8	22,8	22,8
Agree	198	39,6	39,6	69,4		Agree	186	37,2	37,2	60
Undecided	48	9,6	9,6	79		Undecided	62	12,4	12,4	72,4
Disagree	76	15,2	15,2	94,2		Disagree	96	19,2	19,2	91,6
Totally Disagree	29	5,8	5,8	100		Totally Disagree	42	8,4	8,4	100
Total	500	100	100			Total	500	100	100	

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Q5	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	118	23,6	23,6	23,6
Agree	205	41	41	64,6
Undecided	82	16,4	16,4	81
Disagree	65	13	13	94
Totally Disagree	30	6	6	100
Total	500	100	100	

Q6	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	75	15	15	15
Agree	222	44,4	44,4	59,4
Undecided	75	15	15	74,4
Disagree	93	18,6	18,6	93
Totally Disagree	35	7	7	100
Total	500	100	100	

Q7	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	39	7,8	7,8	7,8
Agree	155	31	31	38,8
Undecided	110	22	22	60,8
Disagree	128	25,6	25,6	86,4
Totally Disagree	68	13,6	13,6	100
Total	500	100	100	

Q8	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	64	12,8	12,8	12,8
Agree	164	32,8	32,8	45,6
Undecided	97	19,4	19,4	65
Disagree	97	19,4	19,4	84,4
Totally Disagree	78	15,6	15,6	100
Total	500	100	100	

Q9	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	72	14,4	14,4	14,4
Agree	163	32,6	32,6	47
Undecided	91	18,2	18,2	65,2
Disagree	101	20,2	20,2	85,4
Totally Disagree	73	14,6	14,6	100
Total	500	100	100	

Q10	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	69	13,8	13,8	13,8
Agree	174	34,8	34,8	48,6
Undecided	100	20	20	68,6
Disagree	103	20,6	20,6	89,2
Totally disagree	54	10,8	10,8	100
Total	500	100	100	

Q11	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	51	10,2	10,2	10,2
Agree	174	34,8	34,8	45
Undecided	107	21,4	21,4	66,4
Disagree	113	22,6	22,6	89
Totally disagree	55	11	11	100
Total	500	100	100	

Q12	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	82	16,4	16,4	16,4
Agree	175	35	35	51,4
Undecided	107	21,4	21,4	72,8
Disagree	80	16	16	88,8
Totally disagree	56	11,2	11,2	100
Total	500	100	100	

Q13	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	72	14,4	14,4	14,4
Agree	187	37,4	37,4	51,8
Undecided	131	26,2	26,2	78
Disagree	67	13,4	13,4	91,4
Totally disagree	43	8,6	8,6	100
Total	500	100	100	

Q14	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	70	14	14	14
Agree	187	37,4	37,4	51,4
Undecided	118	23,6	23,6	75
Disagree	77	15,4	15,4	90,4
Totally disagree	48	9,6	9,6	100
Total	500	100	100	

Q15	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	296	59,2	59,2	59,2
Agree	143	28,6	28,6	87,8
Undecided	18	3,6	3,6	91,4
Disagree	32	6,4	6,4	97,8
Totally disagree	11	2,2	2,2	100
Total	500	100	100	

Q16	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	289	57,8	57,8	57,8
Agree	145	29	29	86,8
Undecided	27	5,4	5,4	92,2
Disagree	24	4,8	4,8	97
Totally disagree	15	3	3	100
Total	500	100	100	

Q17	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	296	59,2	59,2	59,2
Agree	144	28,8	28,8	88
Undecided	27	5,4	5,4	93,4
Disagree	24	4,8	4,8	98,2
Totally disagree	9	1,8	1,8	100
Total	500	100	100	

Q18	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	244	48,8	48,8	48,8
Agree	165	33	33	81,8
Undecided	28	5,6	5,6	87,4
Disagree	40	8	8	95,4
Totally disagree	23	4,6	4,6	100
Total	500	100	100	

Q19	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	193	38,6	38,6	38,6
Agree	160	32	32	70,6
Undecided	67	13,4	13,4	84
Disagree	50	10	10	94
Totally disagree	30	6	6	100
Total	500	100	100	

Q20	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	212	42,4	42,4	42,4
Agree	166	33,2	33,2	75,6
Undecided	49	9,8	9,8	85,4
Disagree	44	8,8	8,8	94,2
Totally disagree	29	5,8	5,8	100
Total	500	100	100	

Q21	Frequency	Percentage	Valid percentage	Accrued percentage	Q22	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	166	33,2	33,2	33,2	Totally agree	153	30,6	30,6	30,6
Agree	137	27,4	27,4	60,6	Agree	147	29,4	29,4	60
Undecided	71	14,2	14,2	74,8	Undecided	86	17,2	17,2	77,2
Disagree	80	16	16	90,8	Disagree	67	13,4	13,4	90,6
Totally disagree	46	9,2	9,2	100	Totally disagree	47	9,4	9,4	100
Total	500	100	100		Total	500	100	100	

Q23	Frequency	Percentage	Valid percentage	Accrued percentage	Q24	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	168	33,6	33,6	33,6	Totally agree	156	31,2	31,2	31,2
Agree	180	36	36	69,6	Agree	174	34,8	34,8	66
Undecided	55	11	11	80,6	Undecided	68	13,6	13,6	79,6
Disagree	62	12,4	12,4	93	Disagree	61	12,2	12,2	91,8
Totally disagree	35	7	7	100	Totally disagree	41	8,2	8,2	100
Total	500	100	100		Total	500	100	100	

Q25	Frequency	Percentage	Valid percentage	Accrued percentage
Totally agree	169	33,8	33,8	33,8
Agree	164	32,8	32,8	66,6
Undecided	77	15,4	15,4	82
Disagree	59	11,8	11,8	93,8
Totally disagree	31	6,2	6,2	100
Total	500	100	100	

As shown in each one of the Tables presented above, the different perceptions that Ecuadorian teachers have in the 20 questions of the Colquitt⁷ survey are shown. At the end of this section, the 5 added questions that refer to ICT⁸ will be analyzed. Regarding the first dimension, which is distributive, we can verify that, in four questions on the scale, they talk about whether the rewards reflect the effort that has been put into the work; if the rewards are appropriate for the job; if the rewards reflect what has been contributed to the organization; if the rewards are fair considering the performance; There is an average acceptance of 65.45% and a 24.25% disagreement.

The dimension of procedural justice, contains seven questions that refer to whether they are capable of expressing points of view and feelings before the procedures used to give rewards; if the rewards obtained from these procedures have been influenced; if the procedures for giving rewards have been consistently applied (in the same way to all employees); if the procedures for giving rewards have been applied in a neutral manner (without prejudice); if the procedures for giving rewards have been based on accurate information; if they have been able to claim the job rewards they deserve according to these procedures and if the procedures for giving rewards have been based on ethical and moral standards. The results show an average acceptance level of 45.8% and 32.4% that do not agree. This dimension is

⁷Questions Q1, Q2, Q3, Q4; Q6, Q7, Q8, Q9, Q10, Q11, Q12; Q15, Q16, Q17, Q18; Q20, Q21, Q22, Q23, Q24, are the questions to measure the perception of the organizational justice scale of Colquitt (2001).

⁸Questions Q5; Q13, Q14; Q19 and Q25 are the additional questions asked in the survey, in order to know the use that is being given to ICT for the improvement of the different types of justice analyzed.

the one that obtains a lower percentage of acceptance and higher in disagreement, and may be due to the fact that teachers have a demotivating perception in the normative and regulatory procedures given by national organizations to obtain their rewards.

The dimension of interpersonal justice, on the other hand, contains four questions on the scale, where it can be perceived that they talk about whether the management team has treated in an educated manner; if the management team has treated with dignity; if the management team has treated with respect and if the management team has avoided inappropriate jokes or comments. The results show an average acceptance of 86.1% and a disagreement of 8.9%. This dimension contains the answers with the highest percentage of acceptance and, consequently, the lowest percentage disagreed.

The last dimension, the information that refers in its five questions to whether the management team has been sincere in communicating with you; if the management team has explained in detail the procedures that will be used to reward the work; if the explanations of the management team, regarding the procedures to reward have been reasonable; if the management team has communicated details related to the work in a timely manner and if the management team takes into account the specific needs of the employees to communicate with them, it obtains an average acceptance level of 66.4% and 20.5% rejection.

The results on the five additional questions to the Colquitt survey, which refer to ICT, show that the population under study, in general, has a favorable attitude in the use of ICT (61% acceptance). When asked if the management team has favored the use of ICT as a means of informing the effort, results and rewards, 64.6% responded favorably. When asked if the management team has promoted the use of ICT to facilitate the procedures used, they responded favorably by 51.8%. Regarding the question, of whether the team management has favored the use of ICT as a means of reflection and debate, responded favorably 51.4%. The professors indicated that 70.6% agree on whether the management team has promoted the use of ICTs to facilitate relations between personnel in an environment of trust and respect. Finally, when asked if the management team has favored the use of ICT as a key communication factor in labor relations, 66.6% responded favorably.

4. Conclusions and Some Policy Implications

The objective of this work was to validate the psychometric properties of the Organizational Justice Scale of Colquitt (2001) and to determine the perception of this justice in a sample of 500 professors from public universities in Ecuador. From the results obtained we can conclude that the organizational justice scale of Colquitt is an instrument that has the adequate psychometric properties to be used in the Ecuadorian context.

The results obtained conclude that the structure of four organizational justice factors (distributive, procedural, interpersonal and informative) are concordant as in other studies carried out in different countries, according to the studies carried out (Colquitt, 2001; Díaz-García *et al.*, 2014; Enoksen, 2015; Olsen *et al.*, 2012; Omar *et al.*, 2003; Streicher *et al.*, 2008). This finding contributes to the existing body of knowledge about the structure of the organizational justice scale of Colquitt, as well as to the conception of organizational justice as a four-factor construct (distributive, procedural, interpersonal and informative). Therefore, it can be concluded that the Colquitt Organizational Justice scale maintains its internal consistency and construct validity for a sample of university professors from Ecuador.

It can also be indicated that of the four dimensions, the one that obtained a higher percentage of acceptance was the interpersonal with 86.1%, followed by the informative with 66.4%, the distributive with 65.5% and finally the procedural with 45.8%. The institutions of public higher education of Ecuador, go through a significant stage of change and transformation from the political to the academic in which short-term changes are proposed regarding the normative and that is where it is necessary to study the processes of organizational change, and achieve greater assimilation through the management of elements such as the perceptions of justice that can lead to these being assimilated in a better way, in this case by university professors.

Organizational justice of a procedural nature implies that teachers will be more motivated if they perceive that the procedures used to evaluate their work are fair. On the contrary, if they perceive that their performance will not be evaluated in an exact way and that their real contributions will not be valued, they tend to present demotivation. Teachers also perceive a high procedural justice when they can participate in the construction and improvement of the organization's procedures, in this way they can express their opinions and points of view before them (Rawls, 1971).

On the importance of ICT in organizational justice in the institutions, particularly in its use for the improvement of procedural justice (questions P13 and P14), there is an important margin for improvement. The Ecuadorian universities must reorganize their structure in order to adapt to the constant technological growth and social demand. These changes are demanding, on the part of the members of the higher education communities, especially the professors, the development and acquisition of skills that allow them to incorporate more dynamic scenarios in the exchange of knowledge, seeking strategies that allow them to improve these weaknesses.

As a final conclusion, the scientific evidence indicates that the greater the perception of organizational justice, the higher the level of organizational commitment, since there is a positive direct correlation in all the items studied, which gives the staff greater job stability, acceptance of goals, less absenteeism, low turnover of staff and greater job satisfaction, in accordance with the so-called Theory of Interpersonal

Justice (Tyler & Bies, 1990) that considers that the distributive justice dimension and the procedural justice dimension can influence the quality of the relationship between the manager and the employee, favoring integration and belonging to the work team, identifying with the organization.

In this sense, it is also important to consider the importance of the process defined as the Effect of the Fair Process, in which the dimension of procedural justice, together with the interpersonal and informative dimension, and their combinations can influence the results in organizations (Sinclair 2003). Therefore, a double commitment on the part of higher education institutions is fundamental, on the one hand, in the periodic development of personnel evaluations on their perception of organizational justice and, on the other hand, in the implementation of organizational practices that are aimed at achieving a better university.

References:

- Adams, J.S. 1963. Towards an understanding of inequity. *Journal of Abnormal and Social Psychology*, 67(5), 422.
- Adams, J. 1965. Inequity in social exchange. *Advances in experimental social psychology*, 8, 267-299.
- Aquino, K. 1995. Relationships among pay inequity, perceptions of procedural justice, and organizational citizenship. *Employee Responsibilities and Rights Journal*, 8, 21-33.
- Bies, R.J. 1986. Interactional justice: Communication criteria of fairness. *Research on negotiation in organizations*, 1, 43-55.
- Cohen, R.L. 1986. *Justice: Views from the social sciences*. New York: Plenum.
- Cohen-Charash, Y. & Spector, P. 2001. The role of justice in organizations: A meta-analysis. *Organizational Behavior and Human Decision Processes*, 86, 278-321.
- Colquitt, J.A. 2001. On the dimensionality of organizational justice: A Construct Validation of a Measure. *Journal of Applied Psychology*, 86, 386-400.
- Colquitt, J., Scott, B., Rodell, J., Long, D., Zapata, C., Conlon, D. & Wesson, M. 2013. Justice at the millennium, a decade later: A meta-analytic test of social exchange and affect-based perspectives. *Journal of Applied Psychology*, 98, 199-236.
- Díaz-Gracia, L., Barbaranelli, C. & Moreno-Jiménez, B. 2014. Spanish version of Colquitt's organizational justice scale. *Psicothema*, 26(4), 538-544.
- Enoksen, E. 2015. Examining the dimensionality of Colquitt's Organizational Justice Scale in a public health sector context. *Psychological Reports*, 116(3), 723-37. Doi: 10.2466/01.PR0.116k26w0.
- Fabrigar, L.R., Wegener, D.T., MacCallum, R.C., Strahan, E.J. 1999. Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4(3), 272-299.
- Ferrando, P.J., Anguiano-Carrasco, C. 2010. El análisis factorial como técnica de investigación en psicología. *Papeles del Psicólogo*, 31(1), 18-33.
- Genesi, M. & Suarez, F. 2010. Quality management of human talent in intelligent educational organizations.. *Orbis. Revista Científica Ciencias Humanas*, 6(17), 116-155.
- González Salazar, L. 2003. The power of the informal organization in administrative management. *Revista Educación*, 27(1), 187-195.

- Greenberg, J. 1987. A taxonomy of organizational justice theories. *Academy of Management Review*, 12, 9-22.
- Greenberg, J., Bies, R.J. & Eskew, D.E. 1991. Establishing fairness in the eye of the beholder: Managing impressions of organizational justice.
- Greenberg, J. 1993. Looking fair versus being fair: Managing impressions of organizational justice. *Research in Organizational Behavior*, 12, 111–157.
- Hurtado Morales, L.K. 2014. Relationship between the perception of organizational justice, job satisfaction and organizational commitment of teachers from a private university in Bogotá.
- Infante Barboza, X.I. 2015. Influence of organizational justice on trust and job satisfaction in employees of a manufacturing company.
- Kaiser, H. F. 1958. The varimax criterion for analytic rotation in factor analysis. *Psychometrika*, 23, 187-200.
- Konovsky, M., Folger, R. & Cropanzano, R. 1987. Relative effects of procedural and distributive justice on employee attitudes. *Representative Research in Social Psychology*, 17, 15-24.
- Leventhal, G. 1980. What should be done with equity theory?. New approaches to the study of fairness in social relationships. *Social Exchange Theory*, 27-55.
- Lloret-Segura, S., Ferreres-Traver, A., Hernández-Baeza, A. & Tomás-Marco, I. 2014. The Exploratory Factor Analysis of the Items: a practical, revised and updated guide. *Anales de Psicología*, 30(3), 1151-1169.
- Moorman, R.H. 1991. Relationship between organizational justice and organizational citizenship behaviors: Do fairness perceptions influence employee citizenship?. *Journal of Applied Psychology*, 76, 845-855.
- Münch, L. 2010. Administration: organizational management, approaches and administrative process. México: Pearson Educación.
- Naranjo, K. & Hidrovo, C. 2017. Relationship between perceptions of organizational justice and the level of organizational commitment in teachers of the PUCE Matriz Quito. *Revista PUCE*, 105, 125-154.
- Olsen, O.K., Myrseth, H., Eidhamar, A. & Hystad, S.W. 2012. Psychometric properties of a four-component norwegian organizational justice scale. *Psychological reports*, 110(2), 571-588.
- Omar, A. 2006. Organizational justice, individualism-collectivism and work stress. *Psicología y Salud*, 16(2), 207-217.
- Omar, A. & Florencia, U.A. 2010. The impact of national culture on organizational culture. *Universitas Psychologica*, 9(1), 79-92.
- Omar, A., Salessi, S., Vaamonde, J. D. & Urteaga, F. 2018. Psychometric properties of the Colquitt Organizational Justice Scale in Argentine workers. *Liberabit*, 24(1), 61-79.
- Ortiz, C.G. 2011. Administrative management system and its impact on quality in the service of the Andino Real hotel in the city of Ambato, Ecuador.
- Pedraja-Rejas, L., Sjoberg, O., Rodríguez-Ponce, E. & Cuadra, A. 2015. Conflict and organizational justice as determinants of the results of the decision-making process: a study for SMEs in Chile and Peru. *Interciencia*, 107-113.
- Price, J. & Mueller, C. 1986. *Handbook of organizational measurement*. Marshfield, MA: Pittman.
- Quezada-Abad, C., Teijeiro-Álvarez, M., Riofrío-Orozco, O. & Brito-Gaona, L. 2018. ICT and its mediation in strengthening higher education. *Revista Espacios*, 39(35), 32.

- Quezada-Abad, C., Teijeiro-Álvarez, M., & Brito-Gaona, L. 2019. The incidence of administrative management in organizational justice: Case of the Technical University of Machala. *Revista Opción*. ISSN: 1012 - 1587 (online). In press.
- Rawls, J. 1971. *A Theory of Justice*. Cambridge Massachusetts: Harvard University Press.
- Rodríguez, R., Martínez, M. y Salanova, M. 2014. Justicia organizacional, engagement en el trabajo y comportamientos de ciudadanía organizacional: una combinación ganadora. *Universitas Psychologica*, 13(3), 961-974.
- Rodríguez-Montalbán, R., Martínez-Lugo, M. & Sánchez-Cardona, I. 2015. Analysis of the psychometric properties of the Colquitt organizational justice scale in a sample of employees in Puerto Rico. *Revista Puertorriqueña de Psicología*, 26(2).
- Ruiz, C. 2003. Programa Interinstitucional Doctorado en Educación - Confiabilidad. Recuperado el 14 de Marzo de 2015, de <http://200.11.208.195/blogRedDocente/alexisduran/wpcontent/uploads/2015/11/COFIABILIDAD.pdf>.
- Sinclair, A.L. 2003. Disentangling contributions of process elements to the fair process effect: A policy-capturing approach (ProQuest Dissertations and Theses). Virginia Polytechnic Institute and State University, <http://search.proquest.com/docview/305300456?accountid=14609>.
- Streicher, B., Jonas, E., Maier, G.W., Frey, D., Woschée, R. & Wabmer, B. 2008. Test of the construct and criteria validity of a German measure of organizational justice. *European Journal of Psychological Assessment*, 24(2), 131-139.
- Tyler, T.R. & Bies, R.J. 1990. Beyond formal procedures: The interpersonal context of procedural justice. In J. S. Carroll (Ed.), *Applied social psychology and organizational settings* (pp. 77–98). Hillsdale, NJ: Lawrence Erlbaum.
- Vásquez Mireles, R., Mejía De León, Y. & Rodríguez Villanueva, B. 2014. Retention of human talent in organizations. *Global Conference on Business and Proceedings*, 1773-1781.
- Vaamonde, J.D. 2013. Sexism in the workplace in the light of personal values and perceptions of organizational justice (Doctoral Thesis). National University of La Plata. Argentina. Recovered from http://sedici.unlp.edu.ar/bitstream/handle/10915/32464/Documento_completo.pdf?sequence=1.
- Vaamonde, J.D. & Salessi, S. 2014. Organizational justice: An analysis of its theoretical implications and its empirical exploration in the Argentine organizational sphere. *Science and Technology: Dissemination of the scientific and technological production of the National University of Rosario*, 743-746.