DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
COMPETITION COMMITTEE

LATIN AMERICAN AND CARIBBEAN COMPETITION FORUM - Session I: Fining methodologies for competition law infringements

- Contribution from Ecuador -

24-25 September 2019, San Pedro Sula, Honduras

The attached document from Ecuador is circulated to the Latin American and Caribbean Competition Forum FOR DISCUSSION under Session I at its forthcoming meeting to be held on 24-25 September 2019 in Honduras.

Ms. Lynn Robertson, Manager GFC, LACCF; Competition Expert - Lynn.Robertson@oecd.org.

JT03451356

Session I: Fining methodologies for competition law infringements

Proposal for calculating fines for competition law infringements in the case of Ecuador: *from Abstraction to Legitimate Confidence*[1]

– Contribution from Ecuador[*] –

1. Introduction

1.   The functions performed by competition agencies, as supervisory bodies, carry considerable responsibility. From an economic perspective, they are geared towards making the market function properly, for an efficient allocation of resources. In the legal sphere, they protect the market's smooth functioning, preventing anticompetitive practices through laws that facilitate the management of these agencies, with prevention, correction, eradication and punishment of the practices laid down in such laws.

2.   In exercising their powers, one of the most complex tasks faced by these agencies is the calculation of fines for competition law infringements. This is because several of the criteria for making such calculations may be subject to the subjectivity of the person interpreting the rules, coupled with the risk of arriving at outcomes with a high margin of discretion. Similarly, the technical application of many of the criteria laid down in law can be confusing and ambiguous, in the absence of methodological guidance for overcoming the rules' abstract concepts.

3.   Given the referred to difficulties when applying penalties, and based on the principles of the Constitution of the Republic of Ecuador, and the requirements of domestic competition law, this document presents a proposal for calculating fines in the case of Ecuador that seeks to eliminate or mitigate abstract interpretation of the criteria that should be considered when applying a penalty, and which provides the necessary confidence (both technical and conceptual) of interpretation during practical implementation.

2. Background and legal basis

4.   Article 11(9), of the Constitution of the Republic of Ecuador establishes, as a principle for implementing constitutional rights, that "*The State's supreme duty consists of respecting and enforcing respect for the rights guaranteed in the Constitution.*" For its part, within chapter eight on rights to protection, Article 75 states that "*Every person has the right to free access to justice and the effective, impartial and expeditious **protection of their rights and interests**, subject to the principles of immediate and swift enforcement; in no case shall there be lack of proper defence.*" (Emphasis added.)

---

[1] The proposed fining methodology and the criteria set out in this document pertain solely to their authors and do not represent the firm institutional positions of Ecuador's Competition Authority (*Superintendencia de Control del Poder de Mercado*).

[*] Authors of this contribution: Dr. Gabriela Arias, Dr. Daniel Granja and Dr. Carl Pfistermeister.

5.   Furthermore, Article 76 of the Constitution refers to the guarantees that any due process must have, including that administrative and judicial authorities must be responsible for guaranteeing enforcement of the standards and rights of the parties. In addition, the right to defence must include (among others) the provision of adequate means for the preparation of their defence, and any decisions taken by public authorities must be substantiated (i.e. the legal standards or principles on which a decision is based are set forth, and the relevance of its application to the factual background is explained).

6.   Finally, Article 226 of the Constitution provides that "*State institutions, bodies, agencies, public servants and persons who act by virtue of a state power granted to them shall perform only those duties and wield those powers that are given to them by the Constitution and the law.*" (Emphasis added.)

7.   On the other hand, the Superintendence for the Control of Market Power currently calculates fines and penalties on the basis of Resolution No. 012 of Official Gazette No. 887 of 22 November 2016, issued by the Regulatory Board of the Organic Law for the Regulation and Control of Market Power (*Ley Orgánica de Regulación y Control del Poder de Mercado*),[2] which establishes a mathematical formula quantifying several of the criteria set out in Article 80 of the Organic Law for the Regulation and Control of Market Power (LORCPM).

3. Purpose of the proposed new methodology

8.   We take the view that the current methodology does not provide for all of the criteria that it covers, and that, in turn, it does not offer sufficient technical clarity for its implementation. In addition, we believe that it does not contain the sufficient or necessary effect of deterrence from infringing the law that should characterise this type of regulation.

9.   The current methodology lacks the principle of deterrence, given that its design is very lenient for short-term infringements (up to two years), and the maximum statutory penalty percentages – which differ from the maximum percentages prescribed by law, which are calculated based on the total net revenue of an infringer – are reached within the relevant market in long-term infringements (four and a half years).

10.   Therefore, in view of the provisions laid down in the Constitution on the rights and guarantees of individuals in administrative or judicial cases, and according to our assessment that the current methodology for applying penalties contains deficiencies in its content and in the interpretation of its application, in this document we present a proposal for calculating fines for infringements of the LORCPM that takes into account all of the provisions and criteria laid down in that law, principally in Articles 79 and 80, in addition to other current and related regulatory procedures.

11.   Our proposal therefore seeks to establish, clearly and comprehensively, a methodology – *also based on a mathematical formula* – that observes constitutional and statutory rights and guarantees, and that can correct the shortcomings and obscurities of the

---

[2] Article 35 of the LORCPM recognises the powers and existence of the Regulatory Board in relation to that law.

For its part, Article 95 of the Organic Law for the Regulation and Control of Market Power states that "The Market Power Regulatory Board will issue the methodology for calculating the fines indicated in Article 79 of that law. The Superintendence for the Control of Market Power will apply this methodology according to the criteria laid down in Article 80 *et seqq.* of the same regulations."

current methodology. Thus, the proposed formula has been designed taking into account the following precepts:

12. **Criminality and rule of law:** The penalties must be calculated in accordance with the criteria set forth in the law. Thus, no additional provision or criterion has been included in the proposal that is not explicitly laid down in existing competition legislation.

13. **Legal certainty:** The new methodology seeks to reduce the margin of discretion or avoid the arbitrary manner in which public servants responsible for the procedures subject to penalty by the authority are able to act. In this regard, the aim is to ensure that the parties involved have certainty concerning actions and calculations made within administrative cases.

14. **Clarity of interpretation:** The proposed mathematical formula seeks to avoid ambiguous reasoning or judgments when calculating the fines. This means that the technical interpretation of the formula should not be a criterion that depends on the subjectivity of the public servants responsible for applying them; nor should it restrict the assessment of the specific facts of each individual case, enabling the results to be verified by the parties involved in an administrative penalty case.

15. **Deterrent effects according to the severity of the infringement:** The design of the proposed formula is based on an exponential function, so that fines for the most serious anticompetitive practices are proportional and markedly higher than those for less serious infringements. In this way, it is hoped that the design of the formula will generate the necessary disincentives to dissuade economic operators from infringing the relevant legislation.

16. **Proportionality in the calculation of fines:** In relation to the foregoing precept, although the formula does allow for the level of penalty imposed to be correspondingly greater where the severity of the infringement is greater (whether due to its effects, scope or duration, among other criteria), efforts were made when drafting the formula to avoid fines being imposed on economic operators that could reach or exceed the maximum penalty limits laid down by law[3] (due to the fact that the simulations of penalties estimated with the formula tend, in the majority, to fall below the maximum limits mentioned).

4. Proposal for calculating fines and results of the simulations

17. The proposed calculation is based on the parameters set out in Article 80 of the LORCPM, as follows:

- The size and characteristics of the market affected by the infringement.

- The market share of the economic operator(s) responsible.

- The scope of the infringement.

- The duration of the infringement.

- The effect of the infringement on the rights and legitimate interests of consumers and users, or on other economic operators.

---

[3] Consequently, if the formula calculates a fine that exceeds one of these limits, the penalty that would be applied would, in practice, be the established statutory maximum.

- The profits obtained as a consequence of the infringement.

- Aggravating and mitigating circumstances in relation to each of the responsible undertakings or economic operators.

18.   In accordance with that article, and with Articles 95 to 100 of the Regulation on the LORCPM, the proposed fine calculation methodology is as follows:

$$\begin{matrix} Total\ amount \\ of \\ the\ fine \end{matrix} = \left\{ \left[\sum_{t=1}^{n} \frac{[VNMR_t * \lambda_t * \left(e^{\beta(\alpha_t + HHI_t + \varphi_t + \varepsilon_t)\,\theta_t} + \omega_t \right)10^{-2}]}{n} \right] * \tau \right\} * \psi$$

19.   Where each variable represents:

- **VNMR:** turnover in the relevant market(s) affected by the infringement investigated, in accordance with Article 96 of the Regulation on the application of the Organic Law for the Regulation and Control of Market Power.

- **Lambda (λ):** Variable that records the degree of participation (market share) of an infringing economic operator in the relevant market(s) involved in an investigation (**in accordance with Article 80(b) of the LORCPM**).

- **Alpha (α):** Parameter that measures the size of the affected market (**Article 80(a)**).

20.   The methodology for this parameter provides for a gradation in relation to the total output of the operators in one year. With the purpose of working with a more suitable comparison, this parameter is therefore presented as the ratio between the turnover of the market affected by the anticompetitive practice and the total revenue of the sector according to the six-digit ISIC code to which it belongs, according to information from the Internal Revenue Service (*Servicio de Rentas Internas*, Ecuador's revenue authority).

- **HHI:** Herfindahl-Hirschman Index of the relevant market, representing the characteristics of the affected market. We provide for the inclusion of this variable, because infringements carried out in more concentrated markets would entail more harm to consumers, given the few alternatives that they would have in view of the damage caused by an anticompetitive infringement (**Article 80(a)**).

- **Phi (φ):** Variable that measures the scope of the infringement (**Article 80(c)**) according to the number of provinces affected, weighted by the number of inhabitants in each of them. Designed in such a way that the amount of the penalty increases in proportion to the number of affected people in the national territory.

- **Epsilon (ε):** This parameter assumes a value of one (1), given that, if there were no effects (**Article 80(e)**) on any of the goods protected by the LORCPM, there would be no possibility of imposing a penalty.

- **Theta (θ):** Variable that modulates the percentage of infringement generated by the formula as regards infringing operators whose total revenue, or the majority of whose revenue, derives from the relevant affected market(s).

- **Omega (ω):** Parameter measuring the ratio between the benefits obtained as a consequence of the infringement (**Article 80(f)**) and turnover within the relevant affected market(s) of the infringing economic operator.

- **N (n):** Total number of infringement periods.

- **Tau (τ):** Variable that quantifies the duration of the infringement (**Article 80(d)**) by adding together the periods during which the conduct lasted.

- **Psi (ψ):** Parameter to which a predetermined value is assigned, according to the number of aggravating or mitigating circumstances (**Article 80(g)**) that exist in the administrative penalty procedure.

21.   It is important to note that, for calculating the *base fine* (which will be discussed later), all variables will be taken into account, with the exception of Tau (τ) and of Psi (ψ), which will be considered for the *total amount* of the fine.

4.1. Special considerations of the formula

22.   **Exponential function based on Euler's (e) number:** When designing the formula, we chose for it to take the form of an exponential function based on Euler's number in order to increase the deterrent effect of the fines imposed on infringing operators.[4] This type of function (in comparison to linear functions that have the same gradient all along their curve) has a less pronounced gradient at the start of the curve (i.e. in the case of low-value exponents) and a steeper slope in opposing cases (Figure 1).

---

[4] Euler's number is a mathematical constant that forms the basis of the natural logarithms. Obtained from: http://www-history.mcs.st-and.ac.uk/HistTopics/e.html.

Figure 1. Comparison of linear and exponential function curves
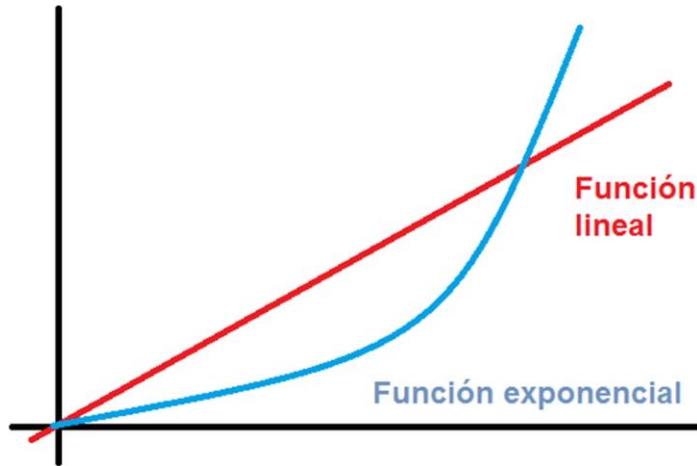
Source: Abramowitz (1965)
Compiled by the author.
[Key: blue = exponential function; red = linear function]

23.   For instance, if the values of the exponents of Euler's number are low (and therefore the criteria of an economic operator subject to a penalty could be of minor severity), the total penalty would also be relatively low. The opposite would occur for economic operators with high severity infringement criteria, where the total penalty begins to increase substantially. Thus, the behaviour of the formula function is consistent with the principle of proportionality where the fines calculated are in line with the severity of the infringement.

24.   Variables representing the criteria concerning the size ($\propto$) and characteristics (HHI) of the affected market, and the scope (φ) and effects of the infringement (ε) have been included within the exponential function. Other variables that could have been included in this function were treated differently within the formula, for methodological or legal reasons, which are explained below.

25.   In addition, when designing this methodology, the percentage of profitability entailed by the illegal benefit derived from the anticompetitive infringement has been established as the lower asymptote,[5] which reinforces the formula's principle of deterrence.

26.   **Calibration of the formula through the Beta (β) parameter:** This parameter of the exponential function has been calibrated in such a way as to avoid volatility in the formula's results, and so that the formula is modulated depending on which type of infringement is being penalised – *minor, serious or very serious*. In addition, it was estimated taking the statutory maximum percentages for each type of infringement as

---

[5] For this purpose, in this particular case, asymptote is taken to mean lower than the lowest penalty limit.

reference,[6] so that calculations of the formula would mostly avoid exceeding those limits and preserve the proportionality of the penalties according to the severity of the anticompetitive practices. However, although in practice the formula estimates penalties that go beyond the maximum penalties laid down by law, the maximum penalty limits would apply to these cases, in accordance with Article 79 LORCPM.

27.   **Calibration of the formula through the Theta (θ) parameter:** This parameter reduces the penalty percentage, to the extent that the sole source of revenue of the infringing operator is that derived from the relevant analysed market.

28.   **Sum of the periods (t) of the infringement:** The formula takes into account that the infringement may occur over several periods, and given that the variables may adopt different values in each of them, the individual calculation is first made per period with inter-temporal variables (i.e. without considering Tau (τ) or Psi (ψ) at this point in the calculation), and all the results obtained are then added together.

29.   **Basis for calculation of the fine:** In order to comply with Article 96 of the Regulation on implementation of the Organic Law for the Regulation and Control of Market Power on setting the basis for calculation of the fine, although the formula takes into account criteria for determining the fine differentiated by period, obtaining an average value for all the periods considered is proposed to determine the basis, for which the total from the previous paragraph is divided by the total number of periods (this being *n*).[7]

30.   **Total basis for calculation of the fine:** Article 98 of the Regulation referred to in the previous paragraph states that the basis for calculating the fine should be multiplied by the duration of the infringement, which in our formula is represented by the variable Tau (τ), in order to obtain the overall basis for calculating the fine.

31.   **Mitigating and aggravating circumstances:** Finally, Articles 99 and 100 of the same Regulation specify that the fine estimated in the preceding paragraph may be increased or reduced if aggravating or mitigating circumstances are found in relation to the infringers.

4.2. Simulations and results of the formula

4.2.1. Criteria for establishing Monte Carlo simulations:

32.   The variable **Phi** has been recreated assuming a national allocation in 70% of cases, and the remaining probability of occurrence distributed equally in allocation to all but one of Ecuador's provinces. Its value range is between zero and one.

33.   The **Lambda** variable has been recreated through a normal distribution, with a mean of 0.4 and standard deviation of 0.13. Its value range is between zero and one.

---

[6] Article 79 LORCPM determines, as statutory maximum penalties, 8% for minor infringements, 10% for serious infringements and 12% for very serious infringements, in all cases based on the total turnover of the infringing economic operator.

[7] Article 96 of the Regulation explicitly omits, for calculation of the base fine, the duration of the infringement (represented by the variable Tau (τ)), and aggravating or mitigating circumstances (represented by the variable Psi (ψ)).

34.   **HHI** has been simulated on the basis of the infringing operator's market share, assuming a uniformly distributed number of operators between 3 and 9 of these, and with an equal distribution of the remaining share of the simulated market.

35.   **Alpha** has been recreated with a normal distribution, with a mean of 0.4 and standard deviation of 0.1. Its value range is between zero and one.

36.   The turnover parameter of the relevant affected market has been simulated with a uniform distribution of between 5 000 and 15 000.

37.   The total turnover parameter has been simulated with a uniform distribution, and assumes the same value as the volume of the relevant market, or up to five times its magnitude.

38.   **Tau** assumes values between 0.5 and 4.5 (years in which an anticompetitive infringement was committed), through a uniform probabilistic distribution.

39.   **Psi** assumes values between 0.75 – when the maximum number of mitigating circumstances is reached – and 1.25, when the maximum number of aggravating circumstances is reached. If the number of mitigating circumstances is equal to the number of aggravating circumstances, this parameter will assume the value of one.

40.   **Omega** has been simulated with fixed values depending on the type of infringement – 4 for minor infringements, 6 for serious infringements and 8 for very serious infringements.

41.   **Theta** modulates the penalty percentage to the extent that the volume of the infringer's revenue derived from the relevant analysed market is less than twice its total net revenue.

42.   Under these considerations, simulations of 10 000 exercises to calculate the fines for each type of infringement under Ecuadorian competition law were carried out (minor, serious and very serious infringements). The simulated results achieved are as follows:

Minor infringements:

- Average penalty in relation to the amount obtained in the relevant market: 19.5% (*in cases of infringements of one year's duration: 7.96%*).

- Average penalty in relation to the infringer's total revenue: 7.55% (*in cases of infringements of one year's duration: 2.99%*).

- Fines exceed the statutory limit in 37.6% of observed cases.

Serious infringements:

- Average penalty in relation to the amount obtained in the relevant market: 26.1% (*in cases of infringements of one year's duration: 10.0%*).

- Average penalty in relation to the infringer's total revenue: 10.0% (*in cases of infringements of one year's duration: 4.0%*).

- Fines exceed the statutory limit in 40.7% of observed cases.

Very serious infringements:

- Average penalty in relation to the amount obtained in the relevant market: 32.0% (*in cases of infringements of one year's duration: 13.1%*).

- Average penalty in relation to the infringer's total revenue: 12.7% (*in cases of infringements of one year's duration: 5.0%*).

- Fines exceed the statutory limit in 43.34% of observed cases.

43.   In our opinion, the results generated by the simulations therefore demonstrate overall compliance with the rules on which the design of this methodology is based, notwithstanding the fact that work continues to refine the formula as it becomes subject to new assessments or observations.

5. Comparative analysis of the calculation of fines in other Latin American competition authorities

44.   In analysing this aspect, it is important to draw a comparison between the criteria and methodologies for applying penalties used by the main competition agencies of Latin America and the proposal described in this document so as to identify similarities or differences between the various authorities, thus enabling us to find opportunities for improvement in applying and enforcing fines in Ecuador.

Table 1. Competition agencies – fine criteria

Competition agency	Structure	Fine criteria	Other criteria
National Economic Prosecutor's Bureau (*Fiscalía Nacional Económica* – FNE) – Chile	Bifurcated into the FNE and the Competition Tribunal (*Tribunal de Defensa de la Libre Competencia*), the latter being responsible for preventing, correcting and penalising violations of competition law "*Ley de Defensa de la Competencia, Decreto Ley No. 211*" (Competition Law).	Article 26(c) of Chile's competition law, Decree Law No. 211, contains guidelines for the competition agency in determining fines, principally establishing the following: "up to a sum equivalent to 30% of the sales of the offender […], in the event that it is not possible to determine the sales or the economic benefit obtained […], fines may be applied up to a sum equivalent to 60 000 annual tax units."	[…] the economic benefit obtained due to the infringement; the severity of the conduct, the deterrent effect, any recidivist conduct if previously convicted for anticompetitive infringements during the past 10 years, the infringer's economic capacity, and his co-operation with the public prosecutor's office before or during the investigation […]
Superintendence of Industry and Commerce (*Superintendencia de Industria y Comercio*) – Colombia	The department (*Delegatura*) is the area responsible for protecting competition, and its purpose is to investigate, correct and penalise anticompetitive business practices and unfair competition, pursuant to Law 1340 of 2009.	Title V of the disciplinary regime laid down in Article 25 of Law 1340 of 2009 establishes, in its relevant section, "for each infringement and each infringer, fines […] of up to 100 000 times the current monthly minimum wage, or up to 150% of the benefit derived from the conduct by the infringer, whichever is greater."	1. The impact of the conduct on the market; 2. The size of the affected market; 3. The benefit obtained by the infringer from the conduct; 4. The extent of the infringer's involvement; 5. The procedural conduct of the persons being investigated; 6. The market share of the infringing undertaking, and the share of its assets and/or sales involved in the infringement, among others.
Federal Economic Competition Commission (*Comisión Federal de Competencia Económica*) – Mexico	The Federal Economic Competition Commission is an autonomous institution created from the constitutional reform of telecommunications and competition, a successor to the Federal Commission for Competition created under the aegis of the Federal Law on Economic Competition.	The relevant section of Article 127 of the Federal Law on Economic Competition provides for, *inter alia*, the following: "a fine up to the equivalent of 175 000 times the general minimum wage […], up to the equivalent of 10% of the income of the Economic Agent having committed an absolute monopolistic practice […], up to the equivalent of 8% of the income of the Economic Agent for a relative monopolistic practice […]".	To determine the severity of the infringement, such as the damage caused; the evidence of intent; the offender's market participation; the size of the market affected; the duration of the practice or merger; as well as their financial standing; and, where applicable, the impact on the exercise of the Commission's powers.

National Institute for the Defence of Competition and Protection of Intellectual Property (*Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual*) – Peru	INDECOPI is made up of several functional bodies, including: the Commission for the Defence of Free Competition (*Comisión de Defensa de la Libre Competencia* – hereinafter, CLC), which is responsible for ensuring compliance with Legislative Decree No. 1034 approving the Law on the Repression of Anticompetitive Conduct.	In this regard, Title VI on Penalties for the Repression and Elimination of Anticompetitive Conduct, in the relevant section of Article 43 of the Law on the Repression of Anticompetitive Conduct, provides for "up to five hundred (500) Peruvian tax units (UIT), provided that fine does not exceed eight per cent (8%) of the sales or gross income received by the infringer […]; serious infringement, a fine of up to one thousand (1 000) UIT, provided that fine does not exceed ten per cent (10%) of the sales or gross income received by the infringer […]; very serious infringement, a fine greater than one thousand (1 000) UIT, provided that fine does not exceed twelve percent (12%) of the sales or gross income received by the infringer […]".	(a) The illegal benefit expected by committing the infringement; (b) The probability of detecting the infringement; (c) The modality and scope of the restriction on competition; (d) The size of the affected market; (e) The market share of the infringer; (f) The effect of the restriction on competition on actual or potential competitors, on other parties in the economic process and on consumers; (g) The duration of the restriction on competition; among other criteria.

Source: Respective Competition Legislation
Compiled by the author.

45.   Table 1 identifies that the four competition agencies use specific criteria laid down in their respective laws. However, there are "other criteria", such as the effect of the practices, the time of infringement, the size of the economic operator, among other parameters that graduate the severity or mitigate the actions of the economic operator that is subject to the penalty.

46.   In Ecuador, as mentioned above, pursuant to Article 79 LORCPM, fines are determined according to the percentage of the total turnover of the infringing undertaking or economic operator in the financial year immediately prior to the imposition of the fine or, alternatively, the number of Unified Basic Wages according to the severity of the infringement. However, Article 80 of that law establishes other criteria for determining the penalties, such as the size and characteristics of the affected market, the market share, the scope of the infringement, the duration and the effect.

47.   From the comparative analysis carried out, we identified that Latin American agencies, including the Ecuadorian agency, appear to be similar at the time of applying "other criteria", leaving the question of whether or not to include parameters that graduate the amount applicable to the infringing economic operators to the arbitrary discretion of those responsible for applying the penalties.

48.   With regard to the application of penalties, we have identified that the competition agencies compared in this document should move from the "Abstraction" of separating the individual factual characteristics, towards generating "Legitimate Confidence", referring to the fact that public administrations will act according to criteria of certainty and predictability.

6. Conclusions

49.   The methodology set out in this document has necessitated a review and analysis of Ecuadorian legislation, from Ecuador's Constitution to the prevailing domestic competition law. We have also performed a literary review of other methodologies for calculating penalties in Latin America in order to identify whether they establish parameters that reduce levels of subjectivity and discretion in applying penalties within their countries.

50.   Within the formula presented here, care has been taken to ensure that it complies with all the legal requirements at national level, as well as with the five precepts that we have set out (*criminality, the rule of law, legal certainty, clarity of interpretation, deterrent effects and proportionality*) in order to satisfy fully the rigour that such a methodology requires.

51.   The proposed formula, despite having a degree of complexity in its initial interpretation, offers specific variables that can be measured within it, together with the calculations that will be carried out. The functional forms put forward by the formula, and the way in which its variables are organised, have both been justified by mathematical criteria in some cases, and in others by statutory obligations that must be met.

52.   The simulations carried out show that there is an appropriate balance in the outcomes that could result in practice, and that they preserve a good degree of proportionality according to the type of infringement simulated (minor, serious or very serious). This is without prejudice to the fact that further adjustments could be made to the formula in pursuit of fulfilling the five precepts indicated above in a more optimal way.

53.   From our analysis comparing competition legislation, we have seen that, generally speaking, no standard quantitative criteria such as those presented here are used. This new concept could therefore create a doctrinal change in the implementation of methodologies for graduating penalties in competition law, efficiently addressing the challenges of adjusting the formula to all types of penalties established in the LORCPM, while involving a criterion of deterrence for economic operators and safeguarding due process.

Legal references

Constitution of the Republic of Ecuador. Official Gazette 449 of 20 October 2008. Available at: https://www.oas.org/juridico/pdfs/mesicic4_ecu_const.pdf.

Ecuador. Organic Law for the Regulation and Control of Market Power. Official Gazette Supplement 555 of 13 October 2011. Available at: https://www.oas.org/juridico/PDFs/mesicic4_ecu_org7.pdf.

Ecuador. Regulation on the Organic Law for the Regulation and Control of Market Power. Official Gazette 697 of 7 May 2012. Available at: https://www.planificacion.gob.ec/wp-content/uploads/downloads/2017/12/Reglamento-LORCPM.pdf.

Ecuador. Resolution 012 of the Regulatory Board on Market Power issues the Methodology for Determining the Fines for Infringements of the Organic Law for the Regulation and Control of Market Power, 23 September 2016. Available at: https://www.planificacion.gob.ec/wp-content/uploads/downloads/2017/12/Resoluci%C3%B3n-012-Determinacion-de-importe-de-multas.pdf.

Chile. Decree Law No. 211 laying down Rules for the Defence of Free Competition. Available at: https://www.fne.gob.cl/wp-content/uploads/2010/12/DL_211_refundido_2016.pdf.

Colombia. Law 1340 of 21 July 2009 by means of which the rules concerning the protection of competition are laid down. Partially governed by Decree 2897 of 2010, published in Official Gazette No. 47792 of 5 August 2010.

"Governing Article 7 of Law 1340 of 2009." Partially governed by Decree 2896 of 2010, published in Official Gazette No. 47792 of 5 August 2010. "Governing Article 14 of Law 1340 of 2009." Obtained from: http://wp.presidencia.gov.co/sitios/normativa/leyes/Documents/Juridica/Ley%201340%20de%2021%20de%20julio%20de%202009.pdf.

Mexico. Federal Law on Economic Competition. New Law published in the Official Federal Gazette of 23 May 2014. Obtained from: http://www.diputados.gob.mx/LeyesBiblio/pdf/LFCE_270117.pdf.

Peru. Legislative Decree No. 1034 approving the Law on the Repression of Anticompetitive Conduct. Obtained from: https://www.indecopi.gob.pe/documents/51771/196578/dl1034.pdf/66c0472e-46de-4eb3-b872-7369c5279583.

Bibliographic references

Abramowitz, Milton (1965), Handbook of Mathematical Functions: With formulas, Graphs, and Mathematical Tables, Dover Publications, Primera Edición, Nueva York.

Hazewinkel, Michiel, ed. (2001), «Euler formulas», Encyclopaedia of Mathematics (en inglés), Springer, ISBN 978-1556080104

Weisstein, Eric W. «Euler Formula». En Weisstein, Eric W. MathWorld (en inglés). Wolfram Research.

Alaminos Prats, Jerónimo (15 de octubre de 2012). «Apuntes de Cálculo avanzado». Departamento de Análisis Matemático de la Universidad de Granada. Consultado el 20 de agosto de 2019.

OCDE (2015) Competencia y Estudios de Mercado en América Latina. Organización de Cooperación y Desarrollo Económico. Disponible en: http://www.oecd.org/daf/competition/competencia-y-estudios-de-mercado-en-america-latina%202015.pdf