Numerical Comparative Competition Law: Effects of Competition Law structures on Competition Intensity Perceptions in Latin America and the Caribbean

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Abstract

This paper goal is to define a method to measure the *index of restrictiveness of competition law* focused on Latin America and the Caribbean and to determine if there are statistically significant causal relationships between competition law goals and the restrictiveness of CL. The index is defined based on the patterns and characters of statutory law and to determine what the incidence of the legal arrangement of competition law institutions in agent's perceptions of the institutional environment of competition is. Regarding causal relationships among competition law and competition intensity Results are not successful to determine a relationship of restrictiveness of competition law and subjective or objective measures of competition intensity. Further research is necessary as measures of competition intensity and policy perceptions are highly correlated.

Keywords: competition law, comparative law, empirical analysis, quantitative analysis,

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Introduction: Competition Policy Goals and Latin America and the Caribbean

Competition policy and competition law have been regarded as strong determinants of competition intensity in market economies[1]. However, competition law institutions are not a "one size fits all" set of rules. The literature has stated that legal origins,[2] trade policy[3] and markets size[4] have the most significant weight on the shape of competition law. In addition, part of the literature has shown that the role of competition law and policy depends on the relative structure of countries[5] measured by market depth and size. In addition to market structure, development levels and orientation towards market

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[1] See: Jean Tirole, *The Theory of Industrial Organization*. Cambridge, MIT Press, 1988; Dennis Carlton & Randal C. Picker, Antitrust and regulation, Working Paper 12902, in http://www.nber.org/papers /w12902, 2007; Suslow, V. *Cartel Contract Duration: Empirical Evidence From International Cartels*, Working Paper, Ann Arbor, Michigan, 2001; Levenstein, M.C., and V.Y. Suslow. *What Determines Cartel Success?* in HOW CARTELS ENDURE AND HOW THEY FAIL, edited by Peter Grossman, Edward Elgar, 2002; Ola Andersson & Erik Wengstrom, Do Antitrust Laws Facilitate Collusion? Experimental Evidence of Costly Communication in Duopolies, Department of Economics, Lund University, 2004; William Landes, Optimal Sanctions for Antitrust Violations, in *University of Chicago Law Review*, Vol. 50, No. 2, pp. 652-678, 1983; Richard Posner. A Statistical Study of Antitrust Enforcement. *Journal of Law and Economics*, Vol. 13, No.2, pp. 365-419, 1970.

[2] See R La Porta, F Lopez-de-Silanes and A Shleifer, 'Economic Consequences of Legal Origins' (2008) 46 Journal of Economic Literature 285; C Lee, *Legal Traditions and Competition Policy* (Institute for Development Policy and Managment, University of Manchester, Manchester 2004); S Djankov and others, 'The New Comparative Economics' (2003) 31 Journal of Comparative Economics 595

[3] See S Miroudot, E Pinali and N Sauter, *The Impact of Pro-Competitive Reforms on Trade in Developing Countries* (OECD, Paris 2007); H First, 'Theories of Harmonization: a Cautionary Tale' in H Ullrich, W Fikentscher and U Immenga (eds), *Comparative Competition Law: Approaching an International System of Antitrust Law* (1. Aufl. edn, Proceedings of the Workshop, Bruges, College of Europe, July 3-5, 1997 Nomos, Baden-Baden 1998); GB Doern and S Wilks (eds), *Comparative Competition Policy: National Institutions in a Global Market* (Clarendon Press, Oxford 1996)

[4] See M Gal, *Size does Matter: Competition Policy in Small States* (Fair Trading Commission, St. Michael, Barbados 2006) and T Stewart, 'Is Flexibility Needed When Designing Competition Law for Small Open Economies? A View from the Caribbean' (2004) Journal of World Trade 725

[5] See Michal S. Gal, Competition Policy for Small Market Economies, Harvard University Press, 2003; Russell Pittman. Competition Law in Central and Eastern Europe: Five Years Later. *Antitrust Bulletin*, 1998, pp. 179-197. Also see: GLOBAL COMPETITION POLICY, J. David Richardson Ed., Edward Montgomery Graham, 1997.

economies are usually regarded as determinants of competition policy and institutions[6]. These characters allow comparison of their legal systems and competition policies and help to identify what is the functional role of competition law and policy in the intensification of market participation and consumer wealth fare.

Are the latter observations applicable to LATCA's competition law? Several difficulties may be foreseen to attain such goal: first, LATCA is a region that includes more than twenty countries and most of them have recently and successfully passed competition legislation; second, legal origins of LATCA countries are not uniform since common law and civil law have influenced such legal systems and; third, LATCA countries deviate greatly in market size and economic development. However, the same difficulties can be translated into advantages as the history of competition law for most of those countries started just in the XXI century and not just legal origins but also trade communities' law and transplants from standard legislations have shaped the region's competition law. In addition, despite different market sizes, LATCA countries have similar aggregate structural constraints such as high industrial market power, rigid regulatory structures and high entry costs and therefore, single firm dominance and oligopoly structures are common market forms in the region that competition authorities in the region face and the law has responded to.

Then, what is the degree of harmonization/convergence of CL in LATCA? What is the effect of different structures for regulating competition in competition intensity? There are several methods applicable to reply to such questions, but in this paper, which is a sub-product of a larger work on indices as a tool of comparative law,[7] I will use quantitative comparative analysis to provide an answer to the previous questions.

1. Numerical Comparative Law and Competition Law

Numerical comparative law or quantitative comparative law[8] is a trend on institutional analysis which is based on the possibility to give a numerical measure to issues as efficiency, effectiveness, harmonization or any other policy goal, respect to a model defined *a priori,* of a set of countries' legal

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[6] J. Francois, & H. Horn, Competition Policy in an Open Economy, Tinbergen Institute Discussion Paper 98-092/2, 1998; Arthur Fraas & Douglas Greer, Market Structure and Price Collusion: An Empirical Analysis. *Journal of Industrial Economics*, Vol. 26, No. 1, pp. 21-44, 1977; Michal S. Gal, Competition Policy for Small Market Economies, Harvard University Press, 2003.

[7] Marquez, Pablo. *Indexing: Uses and Abuses in Numerical Comparative Competition Law,* 2009 (on file with the Author)

[8] Chistoph Kern. *Between formalization and simplification of justice,* 2007 (On file with the author). See also: Siems, Mathias M., "Numerical Comparative Law - Do We Need Statistical Evidence in Law in Order to Reduce Complexity?" *Cardozo Journal of International and Comparative Law.* Vol. 13, pp. 521-540, 2005.

institutions. For example, *convergence* of antitrust institutions can be measured with a number, given a certain standard model, and such number could represent, for example, how close such economy from the optimal model is. In addition, the number becomes valuable as a transnational policy tool seeing that it refers to the "consistency in antitrust law, policy, processes and economic theory across jurisdictional lines"[9]. Most policymakers and legal economists argue for consistency in procedures, fairness in legal treatment and reduction of transaction costs[10], and, therefore, a numerical measure of such qualities of the institutional arrangements helps to develop policy with an objective quality standard and a single purpose and aim.

How is numerical comparative law applicable to Competition Law? The quality of legal institutions can be numerically measured and such measure of antitrust institutions has been in the competition policy research agenda for several years[11] being there different approaches to determine quality indexes or the relationships between indexes and institutions.[12] Several empirical studies have used different kind of methods and techniques to quantify competition legislation quality or competition law efficiency[13]. Some authors use subjective survey methods[14], *dummy* variables or combinations of hard and soft datasets to determine the quality of a policy or the efficiency of an institutional

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[9] See Einer Elhauge & Damien Geradin, GLOBAL ANTITRUST LAW AND ECONOMICS, Foundation Pr, 2007; Ignacio De Leon, LATIN AMERICAN COMPETITION LAW AND POLICY, Kluwer Law International, 2002.

[10] See Edward T. Swaine, The Local Law of Global Antitrust, 43 William & Mary L. Rev. 627, 641-46 (2001). William E. Kovacic, *Getting Started: Creating New Competition Policy Institutions in Transition Economies*, 23 Brook. J. Int'l L. 403, 403-08 (1997) (describing creation of competition policy systems as element of law reform in transition economies). Timothy J. Muris, *Competition Agencies in a Market-Based Global Economy* (Brussels, Belgium, July 23, 2002) (Prepared remarks at the Annual Lecture of the European Foreign Affairs Review), *available at* http://www.ftc.gov/speeches/muris/020723/brussels.

[11] See: Li Way Lee, Some Models of Antitrust Enforcement, *Southern Economic Journal*, Vol. 47, No. 1, pp. 147-155, 1980; Daniel Kaufmann, Aart Kraay, and Pablo Zoido-Lobaton. Aggregating Governance Indicators. World Bank Policy Research Working Paper No. 2195, 1999; Mark Dutz & Maria Vagliasindi, Competition Policy Implementation in Transition Economies: An Empirical Assessment. *European Economic Review,* Vol. 44, 2000, pp. 762-772; Ketevan Lapachi, An Examination of the Present Competition Law of Georgia Using Pittman's Criteria. *Antitrust Bulletin*, Vol. 187, 2002; Rapp, Richard and Richard Rozek. 1990. Benefits and Costs of Intellectual Property Protection in Developing Countries. *Journal of World Trade* 24: 75-90; Michael W Nicholson, Quantifying Antitrust Regimes, *Erasmus Law and Economics Review*, Vol. 3, No. 1, 2007, pp. 41-62, Simon Evenett. *How Much Have Merger Review Laws Reduced Cross Mergers and Acquisitions?* Mimeo, World Trade Institute, 2002.

[12] Marquez, Pablo. *Indexing: Uses and Abuses in Numerical Comparative Competition Law,* 2009 (on file with the Author)

[13] See: Frederic Jenny, Competition and Efficiency, in Barry Hawk, ed., *International Antitrust Law & Policy: Annual Proceedings of the Fordham Corporate Law Institute.* Vol. 20, 1995; William Landes, Optimal Sanctions for Antitrust Violations, in *University of Chicago Law Review*, Vol. 50, No. 2, pp. 652-678, 1983; Richard Posner. A Statistical Study of Antitrust Enforcement. *Journal of Law and Economics*, Vol. 13, No.2, pp. 365-419, 1970;

[14] See: Daniel Kaufmann, Aart Kraay, and Pablo Zoido-Lobaton. Aggregating Governance Indicators. World Bank Policy Research Working Paper No. 2195, 1999; Ketevan Lapachi, An Examination of the Present Competition Law of Georgia Using Pittman's Criteria. *Antitrust Bulletin*, Vol. 187, 2002;

arrangement. Such measure is usually taken as an independent or a dependent variable to show causal relationships within the index or from the index to third variables.

What is the effect of different structures for regulating competition in competition intensity? This question requires some explanation. Empirical evidence has been erratic when determining what the effects of competition law are in markets and competition intensity.[15] Part of the literature has empirically shown that the role of competition law in competition –intensity levels- is not straight forward, but highly determined by both legal origins and relative market depth and size structures.[16] Students of these issues have also claimed that, in addition to the aforementioned determinants, trade policy and institutional strength might also be considered as determinants of competition levels in market economies and not necessarily competition law and its enforcement.[17] However, no one has made an assessment of the effects of CL in markets concentration isolating the effect and giving weights to different pillars of policy.

2. Indices of Competition Law

As was said before, this paper goal is to define a method to measure the Latin American *index of competition law structure and policies*, according to the pattern and characters of statutory law and to determine what the incidence of the legal arrangement of competition law institutions in agent's perceptions of the institutional environment of competition is. Before getting there, it is necessary to review the different uses of indexes in competition law.

The most cited index is the Antitrust Law Index (hereinafter ALI) designed by Nicholson.[18] The author proposes a method to measure antitrust law in terms of its relation with outcomes as finds a gap regarding the measures of antitrust law.[19] Nicholson's first goal is to quantify 'the presence of antitrust laws in

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[15] AE Rodriguez, 'An Empirical Examination of Competition Policy Performance' (2006) 22 Boletin Latinoamericano de Competencia 163 ; M Nicholson, 'An Antitrust Law Index for Empirical Analysis of International Competition Policy' (2008) 4 Journal of Competition Law and Economics 1 ; KN Hylton and F Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' (2007) 74 Antitrust Law Journal 271 ; S Miroudot, E Pinali and N Sauter, *The Impact of Pro-Competitive Reforms on Trade in Developing Countries* (OECD, Paris 2007); M Krakowski, *Competition Policy Works: The Effect of Competition Policy on the Intensity of Competition* (Hamburg Institute of International Economics, Hamburg 2005); F Kronthaler, *Effectiveness of Competition Law: A Panel Data Analysis* (Institut für Wirstchaftsforschung Halle, Halle (Saale) 2007) (provisional paper).

[16] See: R La Porta, F Lopez-de-Silanes and A Shleifer, 'Economic Consequences of Legal Origins' (2008) 46 Journal of Economic Literature 285 ; Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' ; R Pittman, *Competition Law in Central and Eastern Europe: Five Years Later* (EconWPA, 2001).

[17] MS Gal, *Competition Policy for Small Market Economies* (Harvard University Press, Cambridge, Mass. ; London 2003).

[18] Nicholson, 'Antitrust Law Index'

[19] Ibid., ,1

different countries to serve as foundation towards rigorous empirical research on international competition policy'.[20] This quantification later served him to conclude that 'the laws measured in this index show little (or even negative) correlation with survey estimates of actual effectiveness of competition regimes'.[21]

Variations of this index and other indices have been proposed. Hylton and Deng, for example, use Nicholson's ALI to produce and index based on a binary method of codification, where the existence of a rule of competition is graded with 1, and its inexistence with 0. As the ALI, the index is the simple addition of factors regarding territorial scope, remedies, private enforcement, merger notification, merger assessment, dominance, and restrictive trade practices[22] the index is a large number that seems to qualify law quality by number of prohibitions, as the more prohibitions the higher score. The ALI in Hylton-Deng and Nicholson's version does not say anything about restrictive or flexible application of competition law.[23]

Other measures of competition laws are much more precise. For example Hoj, defines a set of indicators to determine a final indicator on Competition Law and Policy.[24] The indicator is based on 27 base indicators which are built in two sets: the first is the Antitrust framework Indicator (hereinafter AFI) and the second is the Network Policies Indicator (NPI). The AFI is built by 2 indicators: the Scope of law and enforcement Legal framework (hereinafter SLE) and the Independence of the competition authorities (hereinafter ICA). The SLE, measures competition laws in statutes and captures the restrictiveness of policy. It is based on 4 criteria: Legal framework, merger regimes, exemptions and enforcement. Finally, the Independence of the competition authorities (ICA) is formed by Institutional design indicators and Accountability indicators.[25]

The coding makes conclusions of Hoj and Hylton-Deng different as Hoj codes based on criteria such as rule of reason and *per se* legality and then assigns a score on real restrictiveness of the law. Hylton and Deng associate the scope and extent of prohibitions with 'antitrust law risk' assuring that countries with higher scores are riskier for undertakings business strategy.[26] In addition, Hylton-Deng index is not weighted giving the same score and value to rules such as the public interest tests in mergers assessment and price fixing in

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[20] Ibid., ,2
[21] Ibid., ,11
[22] Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' ,274-5
[23] P Marquez. *Indexing: Uses and Abuses in Numerical Comparative Competition Law,* 2009 (on file with the Author),12
[24] J Hoj, *Competition Law and Policy Indicators for OECD Countries* (OECD, Paris 2007),1
[25] Ibid.,3
[26] Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' ,314

restrictive trade practices. This is the first problem of the index, as the index is not formed by components their weight in the total index is biased in favour of recently regimes as the Barbadian whose law has just passed (2006) and therefore had included in their regulation every item that current competition law has defined as important.[27]

3. A Competition Law Structure Index: Restrictiveness of Competition and the Weight of the Competition Policy

Departing from the limitations exhibited by the literature, in this section we will define an index to show what the relationships between competition intensity and competition law structures are. A few words are required to explain the index's structure and coding method.

Every jurisdiction has to define a structure of its competition law. Such structure involves the decision and the combination of a set of institutions that include at least an enforcement system, a set of remedies and prohibitions of unilateral and multilateral conduct that are seen as harms of competition. Such structure may be linked to legal origins, market size or trade policy. The function of competition law is defined by such structure that combines two sides of the equation of sanctions in traditional theories of law and economics: the probability to

Regarding systems of enforcement of Competition Law, Gerber[28] says that there are two repetitive models of enforcement of competition laws: a judicial/jurisdictional model and an administrative model. As the author says, 'the first is "basically 'juridical', where competition law is seen as part of 'normal' substantive law... competition law is understood to be a matter of application and enforcement of generally applicable norms by neutral decision makers'.[29] On the other hand, there is the administrative model in which the author finds that 'competition law is seen as the execution of economic policy decisions by administrative officials'.[30]

Regarding remedies and its structure, the simplest classification distinguishes among orders, damages, fines and prison sentences. Remedial structures depend on the prohibition and the enforcement system which grants the competition authority the powers to enforce the law. In addition, prohibitions define the scope of action of enforcement institution and limit undertakings'

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[27] Ibid., ,274-75
[28] See DJ Gerber, 'Two Models of Competition Law' in H Ullrich, W Fikentscher and U Immenga (eds), *Comparative Competition Law : Approaching an International System of Antitrust Law* (1. Aufl. edn, Proceedings of the Workshop, Bruges, College of Europe, July 3-5, 1997 Nomos, Baden-Baden 1998) ,107
[29] Ibid.,107
[30] Ibid.,108

conduct. The structure of antitrust prohibitions is regularly divided into three categories: anticompetitive agreements, abuse of market power and control of mergers.[31] Some authors classify the prohibitions as structural or behavioural but the legislative technique has developed common descriptions of typically prohibited acts that may be used for cross-jurisdictional comparison.[32] For example, Nicholson and Hylton-Deng's approaches for indexing competition divide prohibitions into abuse of dominance and anticompetitive practices. Other authors such as Hoj[33] divide the system of prohibition using the Treaty of Rome classification of abuse of dominance and anticompetitive agreements. Theoretically this is the most acute division since it splits competition policy in the issues of cartelization and the problem of dominance and allows showing different perspectives to different market phenomena.

The question is what is the dynamics of the structure of competition law? At one end, prohibitions limit competition authority's power to intervene. At the other end, remedies and remedial structures define the mechanism to internalize ex post undertaking's harmful activity. Enforcement systems may smooth or impede that the process of internalization of harm be effective. Figure 1 may be able to understand the relationship.
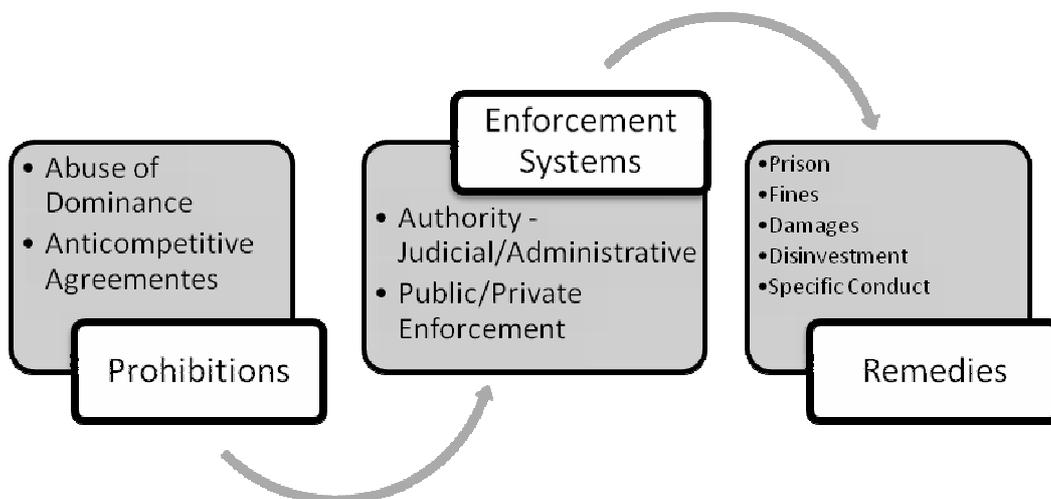
This relationship has different consequences for the definition of an index: First, assumes that mere prohibitions are not enough to measure a competition law system's quality to restrict anticompetitive activity. Second, it assumes that remedies are important in internalizing and comparing competition policies and;

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[31] R Whish, 3

[32] GB Doern and S Wilks, 'Conclusions: International Convergence and National Contrasts' in GB Doern and S Wilks (eds), *Comparative Competition Policy: National Institutions in a Global Market* (Clarendon Press, Oxford 1996), 342

[33] Hoj, *Competition Policy Indicators* ,1

third, allows comparison on individual policies regarding abuse of dominance and anticompetitive agreements, enforcement system and remedies efficiency.

Then, if the latter is correct, just adding binary scores may lead to grant a high score to countries that do not despite having an enforcement system do not have an organization to enforce and blame competition law as not performing its function.

Coding is probably the most important part of the index. This index is aimed to measure how restrictive competition law and its enforcement are in a cross-country perspective. Then, to code for restrictiveness it is necessary that the code displays differences on the prohibitions itself. That is design the code to be able to indicate if prohibitions absolute –*per se*- or relative. Absolute or per se prohibitions are more restrictive as such do not allow further defense nor can be regarded as pro-competitive and therefore not prohibited. To code for restrictiveness only per se prohibitions will be coded 1, rule of reason prohibitions will be coded 0,5 and no prohibition or per se legal practices will be coded 0.

A similar numerical coding will be used for coding enforcement systems. Administrative enforcement systems are regularly inquisitorial and therefore more restrictive that juridical models where the judiciary rules on the merits. Therefore, juridical systems will be coded with 1 and administrative systems with 0. In case of no organization defined to enforce, the code is 0. This last coding decision is relative to the goal of the index. If the index's goal is to compare legal systems the effect of not having a competition authority is not relevant understanding countries differences. However, it must be clarified that such measure is only workable for comparison of the law. If the goal is to evaluate outcomes, the law in action must be represented in the index. Two ways may be useful to achieve such goal: first, representing the effect of not having established a competition authority assuming that antitrust legislation could not be enforced and therefore the index score is 0; or second, weighting the index with a measure of competition policy enforcement efficiency.

Remedial structures and remedies are regularly included in indexes since they may reveal the strength of the competition authority or the judiciary for deterring anticompetitive activity.[34] Coding remedies is difficult as no every remedy can be weighted the same. Theoretically prison is more restrictive than fixed or variable fines and fixed monetary fines are less restrictive than fines attached to the firm's financial results, as percentages of turnover or revenues. Damages and punitive damages have deterrent effects that may be coded and orders of

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[34] Nicholson, 'Antitrust Law Index' and Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects'

behavior may also help constraint undertaking's anticompetitive action. Then remedies will be coded as follows: statutory fixed fines are scored 0,5, orders, flexible fines and damages will be scored 1 point, and prison and treble damages will be coded 2. The scores then will range from 0 to 6.

The results of the four dimensions of the index are shown in Annex 1. All results were normalized in a 0-1 scale to ease calculation and readability of the final index. The non-weighted index shows, for example, that the most restrictive competition law system in the region is the Brazilian as it has an extensive number of prohibitions and a public legal prosecution system that restricts business. El Salvador's and Colombia's systems are also restrictive according to the statutory index since such systems have an extensive number of prohibitions. However, such regimes are not as statutory strict as the Brazilian due to a low number on the structure of remedies. Bolivia, Jamaica and Guyana's regimes are the least strict according to the index. This is due to their lack of a system of merger review and a poor remedial structure which is characterized by orders and fixed fines, granting no direct access to damages or prison sentences.

4. Competition Law Indices and Competition Outcomes: Effects of Competition Law Structures on Policy Perceptions in Latin America and the Caribbean

As was said before, most functional comparative competition law studies have focused on the effect of competition law in domestic competition intensity.[35] The recent most relevant studies are Nicholson's and Hylton-Deng's. Nicholson develops a method to quantify antitrust laws (AL), defining is as a measure of the 'presence' of AL in a set of laws across a large set of countries and translating such quantification into a number to allow comparison.[36] Nicholson's functional analysis, however, finds that "strong laws" do not represent effective antitrust policy[37] and that there is a non linear relation between the adoption AL and size of national economies.[38] Such approach has several limitations that are not going to be highlighted here but most of them are related to coding method, causality and the sole concept of the function of competition law.[39]

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[35] P Marquez. *Indexing: Uses and Abuses in Numerical Comparative Competition Law,* 2009 (on file with the Author),18

[36] Nicholson, 'Antitrust Law Index' ,2

[37] Measured with the subjective effectiveness antitrust policy developed by the World Economic Forum. See Ibid.,

[38] Ibid.,

[39] P Marquez. *Indexing: Uses and Abuses in Numerical Comparative Competition Law,* 2009 (on file with the Author),1-4

Hylton and Deng[40] develop as study similar to Nicholson's. Despite the fact the authors assume that their study is just provisional as empirical studies might always improve the ways to measure the effect of antitrust law in competition, their conclusions are straight forward: there is no statistical evidence that competition laws help to reduce prices or to reduce the intensity of competition.[41] In addition the authors, using empirical analysis, suggest that their study is innovative as it shows that it is possible to measure an 'antitrust risk', which they find is high in the European Union and low in South and Central America.[42] Their empirical estimations of the effect of the law yielded "mix results" suggesting that there is a positive impact of law on perceived competitive intensity.[43] Besides, measure of the impact of law in the "real" intensity of competition is not that robust and the analyses performed by the author using an instrumental variable do not show any incidence of competition law indexes in local competition.[44] Hylton and Deng's approach is, however, much more refined than Nicholson's and their paper is probably the most rigorous work in the field. The study unfortunately bears some of the problems of Nicholson's coding for ALI as their study base.[45]

Other studies are worth to mention. Rodriguez develops an analysis of the effectiveness of AL by means of an empirical examination of competition policy performance testing if competition law -as mechanism aimed at disciplining prices- has had any effect on prices.[46] The author concludes that the existence of AL -measured as a dummy variable- of does not have any statistical impact in on prices -non tradable when other factors are controlled.[47] Dalkir[48] on the other hand, evaluates the competition policy effectiveness and outcome efficacy in a set of sample countries. The author assumes that competition policy efficacy increases with the extent of competition laws and to find if systematic gaps in implementation effectiveness exist between groups of countries that cannot be attributed to differences in resource use.[49] Gaps between the developed and the developing countries, find the author, cannot be bridged merely by increasing the size of competition agencies as such does not have incidence in effectiveness. The author finds that number of staff members and budget do not explain WEF variations when controlled by development

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[40] Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' ,301
[41] Ibid., ,310-311
[42] Ibid., ,308
[43] As measured by the World Economic Forum.
[44] Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' ,308
[45] P Marquez. *Indexing*,1-4
[46] Rodriguez, 'An Empirical Examination of Competition Policy Performance'
[47] The author finds evidence in the first analysis, but once the author corrects the error biases by a Bootstrap Corrected Fixed Effects procedure the evidence seems to disappear.
[48] S Dalkir, *A Quantitative Evaluation of Effectiveness and Efficacy of Competition Policies across Countries* (CRDF, New Delhi 2007)
[49] Ibid., 6

levels or competition agency age.[50] In addition, the author uses competitiveness or competition intensity as a variable to show if there is a positive relationship between effective implementation of CL and policies and the final outcomes.[51] Foreign Direct Investment (FDI) inflows are used as a measure of policy efficacy. Using FDI as independent variable and WEF's competition intensity measure, population and EU membership explain 'policy effectiveness'.[52]

Sounder models are Krakowski's[53] and Dutz-Vagliasindi's[54] whom using different approaches try to determine the effect of the law for competition policy. Krakowsky –in a working paper- explores the relationship between competition policy, the experience in the application of competition policy, the intensity of local competition and the standard of living.[55] The author finds that experience and overall Government effectiveness are the determinants of the perception of the effectiveness of antitrust policy.[56] The author finds that effectiveness of antitrust policy has a robust relationship with the intensity of local competition. The author also tests market size and finds that size has an impact on intensity of competition and, counter intuitively, external protection does not have impact at all.[57] Dutz and Vagliasindi have as aim to 'assess the effectiveness of competition policy across transition economies'.[58] The authors claim as novel their method to measure 'competition policy implementation' and their exploration of a 'robust' relationship between the enforcement, competition advocacy, and institutional effectiveness- and the intensity of competition.[59] The authors analyse the timing of competition law adoption in transition economies and the implementation experience in such countries and the impact on intensity of competition defined objectively.[60] The authors find that institutions – competition law- make a difference in explaining the objective measure of intensity competition law.

5. Effects of Competition Law Structures on Policy Perceptions in Latin America and the Caribbean and Competition Intensity

All the aforementioned shows that two are the most pervasive problems when studying functional comparative competition law or quantitative/numerical

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[50] Ibid., 24

[51] Ibid., 7

[52] Ibid., 29

[53] Krakowski, *Competition Policy Works*

[54] MA Dutz and M Vagliasindi, *Competition Policy Implementation in Transition Economies: an Empirical Assessment* (Europena Bank for Reconstruction and Development, London 1999)

[55] Krakowski, *Competition Policy Works*

[56] Krakowski uses two methods: Ordinary Least-Squares and a three stage Least-Squares (3SLS)Ibid.,

[57] Ibid.,

[58] Dutz and Vagliasindi, *Competition Policy Implementation in Transition Economies: an Empirical Assessment* ,1

[59] Ibid.,3

[60] Ibid.,3

competition law studies. First, the measure of competition law must measure not only the existence of the law but also its restrictiveness. *A priori* one may say that competition law is a determinant of competition intensity if competition law is restrictive: *ceteris paribus*, the more restrictive the system of protection of competition the more intensity of competition in the market. Any measure of competition law that does not measure restrictiveness is just numbering items not measuring the law. Second, the dependent variable must measure the aim of the law. In the case of competition laws, several aims have been defines as the ends of competition law such a protect consumers, incentive free competition or change market concentration.

The major problem then is to find appropriate variables to measure the effect of the law on competition. Most authors have used the Subjective Competition Intensity Index developed by the World Economic Forum.[61] Other authors have used objective variables to measure local competition intensity.[62] The second major problem is to assess such effects on competition in a longitudinal perspective; that is, to assess what the effect on competition of competition law taking into account variation of several variables over time.

5.1. The Data

With respect to the economic data on market structure, we already have data for 18 of the 30 Latina American and the Caribbean countries, but we are expecting to have full data for at least 23 countries. As this will be a panel data econometric analysis, we are studying the functional relationships for the years 1995, 2000 and 2005, in order to have a better assessment of the inter-temporal effects of institutions on perceptions and concentrations[63]. The data comes from WDI, Global Competitiveness Report, Global Competition Review, Economist Intelligence Unit and other sources. The source of such data for 1995 and 2005 come from different sources, as OECD, ECLAC, and individual authors as Coloma, De Leon and others[64] (The data sets cannot be added to this abstract because of its complexity).

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[61] See World Economic Forum, *The Global Competitiveness Report* (Oxford University Press, New York 2008)

[62] Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' , Dutz and Vagliasindi, *Competition Policy Implementation in Transition Economies: an Empirical Assessment*

[63] World Bank, WORLD DEVELOPMENT INDICATORS. In: http://www.worldbank.org, 2006; The Economist, EIU, at: http://www.eiu.com; World Economic Forum. *Global Competitiveness Report 2000-2001* and *2005-2006*. New York: Oxford University Press for the World Economic Forum.

[64] Ignacio De Leon. *LATIN AMERICAN COMPETITION LAW AND POLICY: A POLICY IN SEARCH OF IDENTITY,* Kluwer Law International, 2001; German Coloma, *DEFENSA DE LA COMPETENCIA: ANÁLISIS ECONÓMICO COMPARADO.* Editorial Argentina, 2003; Global Competition Review, at: http://www.globalcompetitionreview.com/; OECD, LATIN AMERICAN COMPETITION FORUM, at: http://www.oecd.org.

5.2. *A priori* model, Hypotheses and Expected Results

The use of competition intensity index as calculated by WEF is useful to show if agents' perception of antimonopoly policy is related with the restrictiveness of competition law institutions. The aim of the *index* is to define if there is a relation of legal institutions with subjective perceptions of antitrust policy. The *a priori* functional form of such model is $CI_{j,t} = f\left(\underset{+}{RCLIndex}, \underset{-}{MD}, \underset{-}{Size}\right)$, which in a linear functional form[65] could be defined as:

$$CI_{j,t} = a + \beta_1 RCLindex_{j,t} + \beta_2 MD_{j,t}' + \beta_3 Size_{j,t} + u_t \quad (1)$$

Where, $B_1...B_3$, are the parameters of the independent variables and:

$CI_{j,t}$ is the competition intensity perceptions index for the country *j*, on time *t*,

$RCLindex_{j,t}$ is the restrictiveness of competition law index *j*, on time *t*,

$MD_{j,t}$ is the aggregate measure of market structure/dominance country *j* and, time *t*,

$Size_{j,t}$ is the size of sanctions matrix for the LATAM country *j*, on time *t*, and

u is the error.

5.3. Mixed Results: Empirical Analysis

Results are displayed in Table 1. Results were controlled by market size to account for differences of development and population density to account for

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[65] In order to define the best model, we found that the simplest functional form could give us a better idea of the way the independent variables are relates with the dependent variable. We have two options, the lineal form, this is $y_i = \beta_1 + \beta_2 x_{2i} + \beta_3 x_{3i} + \cdots + \beta_i x_{Ki} + u_i$, where *i=1,2,...,n; k=1,2,...K*, or a function of the form (Greene, 2000, p. 214) $y_i = e^{\beta_1} x_{i2}^{\beta_2} x_{i3}^{\beta_3} ... x_{iK}^{\beta_K} e^{u_i}$, where *i=1,2,...,n; k=1,2,...K*, which can be expressed as $y_i = e^{\beta_1} \prod_{k=K}^{K} X_{ik}^{\beta_k} e^{u_i}$, where *i=1,2,...,n; k=1,2,...K*, and which could be transformed to the implicit linear form with the properties of logarithms to $\ln y = \beta_1 + \beta_2 \ln x_{i2} + ... + \beta_k x_{ik} + u_i$, *i=1,2,...,n; k=1,2,...K*. The simplest form of these is the linear form.

differences on demand.[66] A first model includes, in addition to the restrictiveness of competition law index –CLSEI- a control variable for market structure, ExDo, which accounts for the extension of dominance in the country as such phenomenon, facilitates collusion and the exercise of abuses of dominant position. Results show no statistical incidence of the restrictiveness of competition law index in subjective definition of competition intensity.

Results of the second model show little or no incidence of competition law restrictiveness index on competition intensity. The controlling variables – population density, gross domestic product and market dominance index- have no significant statistical incidence in subjective measures of competition intensity. These preliminary results are consistent with the results shown by Hylton-Deng and Nicholson whom using a different index and data set, found no statistical evidence of the incidence of competition law scope –or competition law risk- in the subjective measure of competition intensity.

Table 1. Competition Law Restrictiveness and Subjective Competition Intensity

Results

Dependent Variable: CI-WEF

Variables	<1>	<2>	<3>
Constant	7,45852 (11,08***)	7,52408 9,72***	6,76557 (7,473)***
CLSEI	0,226057 0,8836	0,336509 (1,119)	
ESI			.-0,150116 (-0,2659)
RI			.-0,123936 (-0,1438)
ADI			1,15589 (1,360)
AAI			.-0,532635 -0,5876
MRI			.-0,102579 (-0,3329)
ExDo	.-0,795843 (-4,605)***	-0,822758 (-4,263)***	.-0,612442 -2,613**
PopDens		0,0001854 (0,3086)	
GDP		.-4,24 e-13 (-0,6744)	
R2	57%	61%	63%

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[66] See Gal, *Competition Policy for Small Market Economies*

A third model to allow identification of differences among different policies is also unsuccessful to identify statistical significance of the relation between different legal policies on competition law and competition intensity. Neither enforcement structures, ES, remedies extension, RI, abuse of dominance restrictions, ADI, anticompetitive agreements, AA, nor merger regulation, MR, seem to have statistical impact on subjective competition intensity.

Using an objective variable makes no difference on results. Hylton-Deng, following Dutz, uses the Purchase Power Parity as an objective measure of cross-jurisdictional competition intensity as it captures to some degree the effects of market power on prices.[67] Despite criticism that might arise using such variable,[68] results are also unsuccessful to evidence any statistical effect of competition law restrictiveness on competition intensity. Not a single one of the tested models gives robust results.

Table 2. Competition Law Restrictiveness and Objective Competition Intensity

Results			
Dependent Variable: PPP			
Variables	**<1>**	**<2>**	**<3>**
Constant	0,0888714 (0,07615)	0,907546 (0,7460)	.-0,415663 (-0,2660)
CLSEI	.-0,204303 (-0,4605)	.-0,416510 (-0,8815)	
ESI			0,805327 (0,8265)
RI			- 0,448066 (-0,3012)
ADI			0,875857 (0,5970)
AAI			-1,27160 (-0,8127)
MRI			- 0,355240 (-0,6679)
ExDo	0,629053 (2,099)*	0,494449 (1,630)	.-0,612442 -2,613**
PopDens		.- 0,00189701 (-2,008)*	
GDP		.-3,347e- 13 (-	

[67] Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' , 312
[68] P Marquez. *Indexing: Uses and Abuses in Numerical Comparative Competition Law,* 2009 (on file with the Author),19

0,3387)

R2	22%	39%	32%

6. Conclusions

With great accuracy Hylton and Deng say that 'every empirical study is tentative or provisional in the sense that its results are valid, at best, until the next empirical study upends its conclusions'.[69] The nature of this paper is provisional and its results are too. Two claims where maid before: First, any measure of competition law must be a measure not only existence but also restrictiveness. Any measure of competition law that does not measure restrictiveness is just numbering items not measuring the law. Second, several aims have been defined as ends of competition law such a protect consumers, incentive free competition or change market concentration. No single empirical analysis will be accurate unless such variables are rightfully defined.

These two characters of the practice of *indexing*[70] competition laws are the most pervasive and erroneous patterns of numerical comparative competition law. Results are never reliable as indexes do not take into account every element of the dynamics of the law and most assume that the law in books – statutory law- is enough to represent the effects of the law in action. Competition policy goals are also difficult to measure and usually biased and therefore, robust causal relationships are not easy to determine.

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[69] Hylton and Deng, 'Antitrust Around the World: An Empirical Analysis of the Scope of Competition Law and their Effects' , 314

[70] See P Marquez. *Indexing: Uses and Abuses in Numerical Comparative Competition Law,* 2009 (on file with the Author)

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