

Testing the convergence of legal standards in antitrust investigations in BRICS

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Abstract

The content of national competition laws is quite similar throughout the world while the interpretation of such norms and de facto enforcement across countries appears to vary significantly. In order to estimate the variation in enforcement we calculate Legal Standard indicators to measure the level and coherence of economic analysis in antitrust cases in leading developing countries, namely, Brazil, Russia, India, and South Africa (4 of 5 BRICS countries). The indicator reflects case-specific economic analysis undertaken by the competition authority when deciding a case (under administrative enforcement) or presented before judges (under prosecutorial enforcement). The indicator ranges from a pure object-based to an effects-based standard. Using this antitrust case by case indicator we explore the level, dynamics and convergence of legal standards in antitrust investigations in BRICS countries. Our results indicate that the countries differ in the legal standard used, even in the same type of conduct under investigation. There is no evidence of increasing trend or convergence in legal standard in antitrust investigations either between case types or between countries investigated. Resources may matter for the legal standard dynamics as more funding is associated with a higher legal standard in some countries and the consistency of the analysis decreases with workload.

Key words: antitrust governance, competition law enforcement, legal standards, BRICS

1. Introduction

Competition law enforcement differs between countries in terms of scale, focus on specific types of conduct, toughness of penalties and overall effectiveness (however it is measured¹). Researchers try to explain the differences by considering aspects of the practice and details of competition policy, such as specific characteristics in the written competition laws (Bradford et al,

¹ Some measure of the 'effectiveness of competition legislation' is developed by IMD (results are published in the World Competitiveness Yearbook); a measure of the 'effectiveness of antimonopoly policy' is developed by World Economic Forum (results are published in the Global Competitiveness Report);

2019²), and the organizational structure and experience of the competition authority (Jenny, 2016³), motivation and goals including key performance indicators (Kovacic, Hyman⁴, 2016; Avdasheva et al, 2019⁵), budget available (Ma, 2008⁶; Dalkir, 2007⁷), in a non-exhaustive list. The main content of national competition laws is quite similar throughout the world while the interpretation of the same norms and de facto enforcement variation across countries appears to be much larger. Thus, specifics of law on the books do not explain particularities of competition enforcement in a given country. The governance of competition law enforcement may differ across countries beyond legal text variation. The key determinants of the enforcement differences are still an open question.

An answer to this question is important to discuss a more general issue: the divergence of competition practice in the world. Conventional wisdom is that competition laws as they appear ‘in the books’ are very similar over the world in principles and infringement types. During the last two decades, adoption of new competition laws is complemented by the efforts of international expert communities and international organizations such as International Competition Network⁸, OECD and the Competition Working Group within WTO to support the exchange of authorities’ experiences and best practices in order to promote enforcement. At the same time, there is evidence that there are large differences in enforcement approaches that competition authorities in the world apply⁹.

As enforcement of competition law develops over the globe, differences in approaches to enforcement become more evident not only between US and EU¹⁰, and between mature and

²Bradford, A., Chilton, A. S., Megaw, C., & Sokol, N. (2019). Competition Law Gone Global: Introducing the Comparative Competition Law and Enforcement Datasets. *Journal of Empirical Legal Studies*, 16(2), 411-443.

³ Jenny, F. (2016). The Institutional Design of Competition Authorities: Debates and Trends. In *Competition law enforcement in the BRICS and in developing countries* (pp. 1-57). Springer, Cham

⁴ Kovacic, W. E., & Hyman, D. A. (2016). Consume or invest: What do/should agency leaders maximize. *Wash. L. Rev.*, 91, 295.

⁵ Avdasheva S., Golovanova S., Katsoulacos Y. (2019a). The Impact of Performance Measurement on the Selection of Enforcement Targets by Competition Authorities: The Russian Experience in an International Context // *Public Performance & Management Review*. Vol. 42. No. 2. P. 329-356

⁶ Ma T. Legal transplant, legal origin and antitrust effectiveness, *Journal of Competition Law and Economics*, 2008, 9(1), 65–88.

⁷ Dalkir, S. 2007. A Quantitative Evaluation of Effectiveness and Efficacy of Competition Policies across Countries. Presented at CRDF conference Political Economy Constraints in Regulatory Regimes in Developing Countries, New Delhi, March 22–24, 2007

⁸ Hollman, H. M., & Kovacic, W. E. (2011). The international competition network: its past, current and future role. *Minn. J. Int'l L.*, 20, 274.

⁹ Geradin, D. (2009). The Perils of Antitrust Proliferation: The Globalization of Antitrust and the Risks of Overregulation of Competitive Behavior. *Chi. J. Int'l L.*, 10, 189.

¹⁰ Fox, E. M. (2006). Monopolization, Abuse of Dominance, and the Indeterminacy of Economics: The US/EU Divide. *Utah L. Rev.*, 725.

developing jurisdictions¹¹, but also among relatively young jurisdictions, such as BRICS¹². The issue is that competition authorities apply in principle similar legal rules differently. They might use different combinations of presumptions on the effects of particular business practices on competition and welfare and vary depth of economic analysis of the effects of each particular conduct. This generates what are known as competition policy legal standards (Katsoulacos et al, 2016¹³, Katsoulacos, 2019¹⁴) that prescribe what precisely should be proven in order to make the decision on liability. The differences in legal standards provide a direct and effective way to understand competition policy differences across countries, as it focuses on the decision making process and not on inputs (such as budget, agency size) or outcomes (effectiveness). It allows a rare glimpse inside the ‘black box’ of competition policy enforcement.

Legal standards to a large extent reflect different targets and different outcomes of competition investigations in different countries. The legal standards cover the two polar cases in decisions, the strict *per se* (or object based) and the *full rule-of-reason*. In *per se*, the competition authority follows the presumption that harm to welfare outweighs gains for welfare (Katsoulacos et al, 2016). It means that there is no need to prove anticompetitive effects and analyze possible positive efficiency effects. The latter would be highly unlikely and the former certain to justify a *per se* standard. The legal analysis reduces to characterizing the business practice (the object) that took place. A logical unavoidable outcome of the practice is taken to be the competition harm and harm to consumers. The full rule of reason is the other extreme. It includes markers that would point to the situations, as indicated by economic theory, where the practice may actually improve consumers positions or not generate a significant loss to competition. This approach would extend the analysis to the development of a theory of harm and the assessment of possible benefits to consumers.

Until recently, the legal standard in competition enforcement had not been empirically analyzed, because it had not been never systematically measured. The methodology of measuring legal standard was developed by Katsoulacos (2019)¹⁵. The indicator ranges decisions from object based to effects based.

¹¹ Van den Bergh, R. J. (2017). *Comparative competition law and economics*. Edward Elgar Publishing.

¹² See for instance Katsoulacos, Y., & Jenny. (2016). *Competition law enforcement in the BRICS and in developing countries*. Springer International Publishing; Katsoulacos, Y., & Jenny, F. (Eds.). (2018). *Excessive Pricing and Competition Law Enforcement*. Springer.

¹³ Katsoulacos Y., Avdasheva S., Golovanova S. (2016). Legal standards and the role of economics in Competition Law enforcement, *European Competition Journal*, 12:2-3, 277-297

¹⁴ Katsoulacos Y. (2019). On the choice of legal standards: a positive theory for comparative analysis. *European Journal of Law and Economics* (2019) 48:125–165

¹⁵ Katsoulacos Y., Avdasheva S. B., Golovanova S. (2019). A Methodology for Empirically Measuring the Extent of Economic Analysis and Evidence and for Identifying the Legal Standards in Competition Law Enforcement, in: *Frédéric Jenny Liber Amicorum: Standing Up for Convergence and Relevance in Antitrust* Vol. 1. Concurrences, P. 131-150

The legal standards measurement has been applied to four competition jurisdictions – European Commission, Greece, France (mature jurisdictions), and Russia (a relatively young jurisdiction) (Katsoulacos et al, 2021)¹⁶. In this paper we apply the legal standard methodology and try to empirically explain the legal standards that competition authorities apply on investigations of allegedly anticompetitive conducts in 4 of 5 BRICS countries – Brazil, Russia, India, South Africa (BRIS below). We assess impact of different factors on the legal standards that the authorities applied, therefore explaining de facto variation in the enforcement.

Our paper expands on the literature in two ways. First, it expands the legal standard analysis to a larger set of developing countries, comparing Brazil, India, Russia and South Africa. The expanded set of large, developing countries allows a better understanding of the legal standards in relatively young agencies. Second, we use a rich empirical specification with interactions across characteristics for a flexible analysis.

The data is used to provide evidence on a number of hypotheses on the dynamics of the legal standards, taking into account that there may be significant heterogeneity across countries and conduct types. First, we test whether the legal standards average levels have increased, i.e., if there has been a change towards more effects-based analysis. Second, we evaluate if there has been an increase in consistency of economic analysis applied in antitrust investigation. In other words, whether the increase in legal standards has been followed by a more complete and thorough analysis of economic and logic steps. Third, we test if there has been country convergence of the legal standards over time. This convergence may be within country (reducing the variation in legal standards across case types) or between countries. Last but not least, we provide evidence of the association between resources and the legal standard level.

The paper is organized as follows. Section 2 contains a short literature review. Section 3 explains the construction of the aggregate legal standard indicator. Section 4 describes the competition authorities and their institutional design and information used. Section 5 collects initial descriptive statistics on legal standards in our dataset. Section 6 is devoted to the empirical analysis where we test determinants of dynamics of legal standards. Section 7 concludes.

2. Measuring the difference between competition law enforcement: a short literature review

In the modern literature on the difference between competition rules enforcement two streams are important for us: the development of the quantitative indicators to measure differences

¹⁶ Katsoulacos Y., Avdasheva S. B., Benetatou K., Golovanova S., Makri G. (2021). Comparing the Role of Economics/Effects-Based in Antitrust Enforcement and Its Relation to the Judicial Review in the EC to Other Countries // *Journal of European Competition Law and Practice*. Vol. 12. No. 2. P. 122-142

in the enforcement practice of competition agencies and the attempts to explain the differences of the approaches to enforcement.

Alternative metrics for competition law and policy developed have been constructed on the basis of characteristics including substantive provisions, goals and scope of competition law (Nicholson, 2008¹⁷; Bradford et al, 2019¹⁸), competition agencies' resources, investigations and remedies (see OECD Indicators of Competition Law and Policy, GCR Global Competition Review (GCR) Rating Enforcement).

All these indices carry substantial limitations. They measure only the difference of the competition legal rules as they are prescribed 'in the book'. They focus on ex-ante differences in case analysis. They are unable to reflect the actual difference of legal standards, from per se to rules of reasons.

Comparative studies have attempted to overcome this limitation. Borrell and Jimenez (2008) first attempted to take economic analysis that competition authorities undertake under enforcement into systematic comparisons. Borrell and Jimenez (2008) measure economic analysis in the enforcement (in contrast to formalistic application of rules) as a share of conducts which are subject to rule of reason. Their approach is close to ours with one significant difference. The authors consider per se and rule of reason as binary variable, while we construct the legal standard as a continuous between extremes. Not only it allows a more detailed learning of the actual evidence and analysis carried out, but also it avoids the arbitrary classification of the legal analysis in one of two only exclusionary categories.

In another strand of the literature, there were several attempts to explain enforcement practice instead of content of law in antitrust. Ma (2008) describes the effectiveness of enforcement as assessed by expert and legal community. The effectiveness is explained by legal origins for particular country. Following Shleifer (2002) arguments on the impact of difference between legal models in the country of origin and in the country that borrows the law on the further development of legal rules and their enforcement, the author tries to track the influence of 'model law' and legal origin in the host country, on the one hand, and effectiveness of enforcement, on the other.

In our earlier work (Avdasheva et al, 2016; Avdasheva et al, 2019a) we provide empirical evidence that the organizational structure and system of motivation affects enforcement targets in the way, that the authority motivated on a large number of decisions with low annulment rate avoids to take the cases that are likely to be subject of judicial review. This is a strong incentive for shifting of the enforcement structure to per se illegal actions, from the cases that should be

¹⁷ Nicholson, Michael W. 2008. An Antitrust Law Index for Empirical Analysis of International Competition Policy. *Journal of Competition Law and Economics* 4(4):1009-1029

¹⁸ Bradford, A., Chilton, A., Megaw, C., Sokol, N. 2019 see footnote 2.

decided using rule of reason, as prescribed by the law. At the same time, once certain type of economic analysis becomes to be demanded by judges, the authority undertakes it more often (Avdasheva et al, 2019b¹⁹). However, in these works we did not provide a coherent measure of legal standards.

In this paper we focus on the legal standards themselves applied by competition authorities when investigating antitrust cases.

3. The legal standard indicator (LSI)

The methodology first proposed in the paper of Katsoulacos et.al (2018) begins with the assumption that variations in the LSs reflect a *continuum* of which are at the extremes *Strict Per Se* (or object based) and the full Rule of Reason (or *Effects-Based*) standards. The progression towards LSs closer to full effects-based requires that additional “blocks” or components of economic analysis are applied. These are associated with markers such as the definition of the relevant market, the assessment of market power, the assessment of whether market power raising or exclusionary effects are present, the articulation of a theory of harm from the business practice to consumer welfare, the assessment of efficiency effects from the practice and the assessment of what is, ultimately, the net welfare impact of the conduct. These components can be identified by analyzing the documents on particular decisions made by CA.

We consider exclusionary but not exploitative conducts. The reason is twofold. First is that steps of effect-based analysis for exclusionary and exploitative conducts after product and geographical market delineation are different. Generally exploitative abuse does not imply C1 (the analysis undertaken to identify whether conduct has market power enhancing or exclusionary effects, - see below). Therefore, further comparison is impossible. Second, there is much more consensus among academics, lawyers and enforcers about how effect-based analysis should be done for exclusionary conducts. This issue is less clear for exploitative ones and may lead to differences across countries and cases. Last, but not least, there are no such cases in the Brazilian data, as the Brazilian antitrust authority analyzes exploitative conduct as the product of the exclusionary conducts.²⁰

The methodology identifies four broad components or categories of economic analysis (A, B, C and D in Table 1) that must be performed for the investigation of the CA to constitute a full

¹⁹ Avdasheva S. B., Golovanova S., Katsoulacos Y. (2019b). Optimal Institutional Structure of Competition Authorities Under Reputation Maximization: A Model and Empirical Evidence from the Case of Russia. *Review of Industrial Organization*. Vol. 54. No. 2. P. 251-282.

²⁰ Mattos, C. and Ribeiro, E.P. Hello, Goodbye Exploitative prices in antitrust analysis in Brazil. Katsoulacos, Y., & Jenny. (2016). *Competition law enforcement in the BRICS and in developing countries*. Springer International Publishing; Katsoulacos, Y., & Jenny, F. (Eds.). (2018). *Excessive Pricing and Competition Law Enforcement*. Springer

effect-based (or rule-of-reason) analysis. One or more variables (sub-components) make up every one of these main components of economic analysis (e.g. sub-components C.1, C.2, C.3 etc).

Table 1: Types of economic analysis taken into account in the construction of the legal standard indicator

A. <i>Conduct analysis</i>	A. Discussion of the nature and characteristics of the conduct
B. <i>Market analysis</i>	B1. Basic analysis of market characteristics based on available market statistics OR B2. Formal market delineation and market share determination
C. <i>Evidence on restrictions of competition/ harm imposed</i>	C1. Analysis undertaken in order to identify whether conduct has market power enhancing (e.g. through agreements) or exclusionary effects (e.g. in monopolization practices)
	C2. Articulation of theory of harm to consumer welfare (without taking into account of efficiencies)
	C3. Analysis of potential efficiency defense
D. <i>More effects-based analysis to support robustness of C</i>	D. Balancing of potential anticompetitive effects of conduct with all the potential efficiencies and determination of the final impact on total welfare.

Source: Revised from Katsoulacos et.al, (2019)

A straight aggregation of scores across different conduct types will not provide indicators which can be used to undertake meaningful empirical analysis of the extent of economic analysis and type of LSs adopted. Such aggregate indicators cannot be used to measure meaningfully whether economic analysis is used “optimally” – since optimal LSs can only be defined at the level of each conduct. Furthermore, such aggregate indicators cannot be used to make comparisons between different countries and over time – since the level of the aggregate indicator will depend on the composition of conduct types that will be different for different countries and will change over time. Moreover, such aggregate indicators cannot be used to examine how changes in the economic analysis, if measured by changes in the value of the aggregate indicator, affect the annulment rate of the CA’s decisions, since the latter is expected to be influenced by what “type” of economic analysis²¹ is utilized and how this changes, while a given value of the aggregate indicator cannot reflect what “types” of analysis are utilized and, when the value of the indicator changes, what “type” of economic analysis is responsible for the change in the indicator’s value.

To avoid these problems, we consider only the decisions in which coherent economic analysis is present, namely, that each step of economic analysis requires all the previous steps to be made. For example, identification of whether conduct has market power enhancing or

²¹ For example, different types of economic analysis can lead to a score 3 and different ways of increasing economic analysis can increase the score from 3 to 4 but the implications of each case for the rate of annulment may not be the same.

exclusionary effects (the statement C.1) cannot be made without market analysis which is a necessary preceding stage; articulating theory of harm to consumer welfare the authorities (C.2) requires market analysis and identification of the conduct's effects etc. We identify legal standards according to the *last step* CA made under analysis of the case, distinguishing between Strict Per Se ($LSI=1$) and Full Effects-Based ($LSI=6$), corresponding to the level of LSI (see Table 2).

Following this methodology of legal standard assessment, the indicator is not calculated for decisions with missing steps of economic analysis (for instance, assessing market power enhancing effect without proper analysis of the market or developing theory of harm without proper analysis of exclusionary or market power enhancing effects). As an alternative, and not to miss such cases in the data base, we measure legal standards by the maximum level of economic analysis undertaken by competition authority in its investigation. It is indicated by $MaxEA$. This measure can be calculated for all cases.

The cases where the LSI and $MaxEA$ indicators differ convey relevant information. We also consider these cases when modeling the 'gaps' in the analysis carried out by the Competition Authority.

Table 2: Legal standards classification

Value of LSI indicator (components of economic analysis applied in assessment)	Legal Standards
LSI = 1 (A)	<i>Strict Per Se (SPS)</i> LS. The CA makes inferences about effects (on welfare) from the formal characteristics of the conduct.
LSI = 2 (A, B1 or B2)	The <i>Modified Per Se (MPS)</i> LS can be considered as a Per Se rule <i>subject to</i> a Significant Market Power requirement. Under MPS LS the CA makes inferences about effects (on welfare) from the formal characteristics of the conduct, detailed analysis of market characteristics and, depending on the type of conduct, the implications of these on incentives for achieving sustainable collusion and/or on the size of extant market power.
LSI = 3 (A, B1 or B2, C.1)	<i>Truncated Effects Based (TEB)</i> . Under a TEB LS the CA decides that there is liability by inferring adverse welfare effects from the potential of the conduct to distort the competitive process by disadvantaging rivals (i.e. through exclusionary effects) or by enhancing market power (as in a concerted practice case).
LSI = 4 (A, B1 or B2, C.1, C.2)	<i>Intermediate</i> between Truncated and Full Effects Based LS (ITFEB)
LSI = 5 (A, B1 or B2, C.1, C.2, C.3) or	<i>Full Effects Based (FEB)</i> represents the LS under which a finding of liability relies on all potential anticompetitive (exclusionary or market power enhancing) and also all potential pro-competitive effects of the specific conduct being assessed and compared and a showing of

LSI = 6 (A, B1 or B2, C.1, C.2, C.3, D)	adverse effects on <i>welfare</i> (consumer ²² or total ²³) of this specific conduct be then established.
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Source: Revised from Katsoulacos et.al (2019)

4. Competition authorities of BRIS: institutional structure, resources, and the data on competition law enforcement

Competition agencies of Brazil, Russia, India and South Africa are often considered as ‘young’ in contrast to ‘mature’ jurisdictions. The ‘oldest’ recent competition law in force (South African) is less than quarter century old. However, in all the countries recent competition laws replaced previous that were in force before. An important reason for new competition law adoption in all the countries was desire to take into account the advances of competition enforcement in ‘mature’ jurisdictions²⁴.

Table 3. Resources and outputs of competition authorities under comparison (annual average)

	Brazil	Russia*	India	South Africa
Competition authority	Administrative Council of Economic Defense (CADE)	Federal Antitrust Service (FAS)	Competition Commission of India (CCI)	Competition Commission of South Africa (CCSA)
Recent competition law adopted	2011	2006	2007	1998
First competition law adopted	1994	1991	1970	1955
Years covered by the sample	2013-2020	2008-2018	2011-2020	2006-2020
Annual budget, mln USD	6.8-11.2	26,3-60,6	6,3-26,8	3,9-31,8
Number of staff	215-268	1455-2453	97-125	66-275
Annual number of investigations opened	5-3	2395-11431	60-151	82-441
Annual number of mergers applications submitted	377-442	1019-6097	0-113	190-513

²² LSI=5. FEB LS under a Consumer Welfare Substantive Standard. That is, when the criterion about whether or not there is violation of law is whether or not there is an adverse effect on consumer welfare.

²³ LSI=6. FEB LS under a Total Welfare Substantive Standard. That is, when the criterion about whether or not there is violation of law is whether or not there is an adverse effect on total welfare.

²⁴ In Russia, adoption of new competition law (2006) was explicitly promoted as unification of Russian with European competition legislation (see Bradford, A., Chilton, A., & Linos, K. (2021). Dynamic Diffusion. Available at SSRN 3911538.). In Brazil the legislative change was influenced by the OECD Peer Review of competition policy in 2005 and 2010.

*For Russia, as an authority with diversified policy portfolio, we report 70% of annual budget, according to the assessment of (Global Competition Rating Enforcement)

Source: Annual reports of the authorities

On one hand, the list of prohibited anticompetitive conducts in all the countries is very much the same (see Avdasheva et al, 2020)²⁵. On the other, the organization of competition enforcement is different. South Africa uses a prosecutorial model of enforcement. Competition Commission investigates and prosecutes the case before Competition Tribunal. Under administrative enforcement model, Brazil and India differ from Russia. In the former countries, investigation and prosecution, on the one hand, and adjudication, on the other, are divided within one authority. In the latter, investigation, prosecution and adjudication are not separated. There is evidence (see Golovanova, Ribeiro, 2022)²⁶ that division of adjudication and prosecution, even if takes place within the same authority, increases the quality of investigation.

Considering the scale of enforcement, the Russian competition authority the Federal Antimonopoly Service (FAS) outperforms almost every competition agency in the world. Decisions are made by central office as well as regional subdivisions, responsible for enforcement over all-Russian and regional markets respectively. Large part of FAS decisions represents what we call ‘*non-proper antitrust*’ – decisions on abuse of market power that does not restrict competition and harm not the consumers/counterparty as a group but particular consumer/counterparty or small number of them. Share of *non-propre antitrust* decisions exceeds 80% of the overall number of FAS decisions (Avdasheva et al, 2019b)²⁷, and this is second important explanation of large number of investigations and decisions by FAS.

Coding of legal standards applied in antitrust investigations is made for datasets of infringement decisions made by competition authorities of Brazil, Russia, India and South Africa.

The Brazilian dataset on competition enforcement

The Administrative Council for Economic Defense (CADE) is the Brazilian antitrust agency. It is an independent agency reporting to the Ministry of Justice. The authority has jurisdiction over the national territory and performs its legal functions determined by Law N° 12.529/2011 (Competition Act). CADE’s mission is to ensure free competition and avoid harm to the ‘economic order’, a Constitutional concept. CADE is the agency responsible for investigating and deciding, ultimately, on competition issues under the Competition Act. The functions are

²⁵ Competition laws substantially differ in the rules of exploitative abuses of dominance. Fortunately, this does not matter for our study, since our dataset consists only from conducts which restrict competition. Minor difference arises in stronger or weaker presumptions of illegality (Avdasheva et al, 2020). This fact should not affect our results directly, but is important for the interpretation of the results.

²⁶ Golovanova, S. and Ribeiro, E. (2022) Journal of Competition Law and Economics (forthcoming)

²⁷ Avdasheva et al, 2019b - see footnote 19

separated between specialized bodies within the authority which are General Superintendence and Administrative Tribunal of Economic Defense, correspondingly. The decisions are final at the administrative level. CADE's decisions on anticompetitive practices can be appealed in Federal courts.

The information needed for the construction of our dataset was extracted from texts of CADE's infringement decisions issued from 2013 to 2020, when the competition law 12.529 was in effect. The texts of all decisions made are available in CADE's web site. The total number of observations (excluding exploitative abuses) in our dataset is 134. However, LSI indicator can be constructed for 94 cases only as decisions in which "gaps" in economic analysis are present cannot be taken into account.

The Russian dataset on competition enforcement

Russian antitrust enforcement is relatively young. The national competition authority, the Federal Antitrust Service (FAS), which is organized as a system of relatively independent regional sub-departments, was established in 1990. However, the influence of decisions made by competition authorities began to increase rapidly following the introduction of turnover penalties for violations of Russian law "On protection of competition" (up to 4 percent of the violator's turnover in the market affected) in 2007. Since then, several "antitrust legislative packages" (sets of changes and amendments in substantive and procedural rules of competition legislation and enforcement) aimed to implement the best world practiced entered into force.

Competition policy in Russia is organized in the framework of an administrative model. FAS, including the Central Office and relatively independent regional subdivisions, investigates cases and makes decisions on infringements. A company found violating competition law has the right to make a commercial court claim to annul the FAS decision. Court access costs are relatively low in Russia (negligible fees, rule of cost indemnification, no restrictions of representation). All instances examine cases on the merits.

The Russian dataset is based on decisions following the judicial review of the Russian CA's (the Federal Antimonopoly Service, FAS) antitrust infringement cases for the period 2008-2018. The first year of observation is the year following the new law 'On protection of competition' (that was better harmonized with European rules than the previous version was). The observations are claims to appeal infringement decisions made under art. 10 and 11 (including 11.1)²⁸ of the law. We use the content of judicial decisions instead of a FAS dataset. The main reason for this is that in Russia, commercial courts present the data on judicial review for all

²⁸ That concern agreements and abuse of dominance practices.

instances²⁹ in a very systematic and user-friendly manner. And, the dataset of courts' decisions covers all of the decisions made by commercial courts. For the dataset of FAS decisions, this is not a case. This is a serious limitation given that the judicial review outcome forms a crucial part of our analysis.

The total number of observations for all antitrust cases (excluding exploitative abuses) in the dataset is 1287. The number of observations in our dataset on which we rely for the empirical analysis of the LSIs drops to 792.

The Indian dataset on competition enforcement

The Competition Commission of India (CCI) is competition agency of India. It is responsible for enforcing the Competition Act, 2002, "to prevent anti-competitive practices, promote and sustain competition, protect the interests of the consumers and ensure freedom of trade in markets in India."³⁰ . The Commission was established in 2003 and became fully functional in 2009. The Commission is a body of the Ministry of Corporate Affairs.

As in Brazil and Russia, competition law enforcement model in India is administrative which means that CCI makes final decisions on antitrust cases. Investigative and adjudicative functions are separated within a single institution. The CCI's decisions on anticompetitive practices can be appealed at the Company Law Appellate Tribunal.

The information needed for the construction of Indian dataset was extracted from published texts of CCI infringement decisions issued from 2011 to 2020. Texts of the decision ruling at the Commission was downloaded from the CCI website. The total number of observations (excluding exploitative abuses) in our dataset is 85. Following the methodology described in previous Section LSI indicator can be constructed for 46 of them.

The South African dataset on competition enforcement

South Africa is the only BRICS country which follows prosecutorial antitrust enforcement model. The Competition Commission of South Africa (CCSA) is the government agency with investigative functions while decision making is the function of the Competition Tribunal. Both organizations were established in 1999 under the Competition Act, No 89, of 1998. Competition Appeals Court in South Africa is a specialized institution for judicial reviewing of decision on antitrust cases.

²⁹ In Russia, there are four instances in commercial courts: first instance, appellate instance, cassation instance and highest (Supreme) court. Supreme Court has the discretion to consider or not consider cases. Supreme and cassation courts can send cases back to the first instance court. The same decision can result in a cassation instance. As a result, the number of instances regarding a case can be large (the maximum number in our dataset is 10).

³⁰ Competition Commission of India, FAQ.

https://www.cci.gov.in/sites/default/files/advocacy_booklet_document/FAQ.pdf

South African dataset includes all antitrust cases on exclusionary conducts considered by Competition Tribunal in 2002-2021 irrespective of the final decision made. Thus, CCSA and its conclusions on the presence of violation of competition law are in the focus of our study. The total number of observations for all antitrust cases (excluding exploitative abuses) in the dataset is 36. Competition Tribunal decisions are contravened for 23 of them. LSI indicator can be constructed for 34 of them.

South African dataset includes all antitrust cases on exclusionary conducts. The information is collected from case documents at the Competition Tribunal referring to the decision of the CCSA in 2002-2021. The total number of observations for all antitrust cases (excluding exploitative abuses) in the dataset is 36. LSI indicator can be constructed for 34 of them.

5. Cross-country and cross-conducts comparisons of legal standards

We provide descriptive statistics on the original data set used. As legal standards are expected to vary between different types of conducts, we use the classification of conduct groups to control for structural differences in national databases presented on Table 3.

Table 4 – Antitrust violations conduct groups

Group code	Description	Types of conducts
G1	Price fixing and market sharing (cartels)	Price fixing Bid rigging Boycott Market sharing
G2	Concerted practice	Concerted practice Coordination
G3	Vertical agreements	RPM_min RPM_max Vertical exclusionary agreements Exclusive territories
G4	Exclusionary abuse of dominance	Tying Nonprice discrimination

Table 4 presents the number of cases by Competition Authority (CA) and by conduct groups. The total number of observations is 1542. Infringement decisions made by the Russian competition authority make up much of the database (83,3%). The group of cases from South Africa is the smallest one (2,3%). The most numerous conduct group is G1 (price fixing and market sharing). It dominates in all the countries. The relative importance varies, from 86% of cases in

Brazil to 44% in Russia. There is no clear pattern of antitrust violations group cases across countries, as for example, G4 cases are 20% of cases in Russia, but only 3% in South Africa.

Table 5. Country and Conduct group case numbers in the database

Conduct group	Brazil	Russia	India	South Africa	Total
G1	115	554	60	25	754
G2	0	170	6	2	178
G3	9	308	5	8	330
G4	10	255	14	1	280
Total	134	1,287	85	36	1,542

LSI and *MaxEA* are calculated following the methodology described on section 3. The *MaxEA* is the maximum level of economic analysis undertaken by the competition authority and the associated legal standard, while *LSI* is the legal standard that can be identified from the case text, when the analysis is coherent, i.e., the exact sequence of steps on table 2 are observed in the case. When some of the steps are not taken, up to the last observed step, we mark this case as one with a gap. Table 6 provides an overview of such cases across jurisdictions. The coding shows that competition authorities are not always coherent applying different types of economic analysis. For example, in some cases studied, identification of whether conduct has market power enhancing or exclusionary effects (the statement C1) is made without market analysis (B1 and B2) which is a necessary preceding stage; As another example, when articulating theory of harm to consumer welfare (C2) the CA decision sometimes omit market analysis (B1) and/or identification of the conduct's effects. Table 5 presents information on these inconsistencies, that we denote 'gaps' in the economic analysis. The gaps can be identified when *LSI* differs from *MaxEA*.

Table 6. 'Gaps' in economic analysis in case decisions

Competition authority	Indicator	The highest level of economic analysis which is present in the decision					
		A	B	C1	C2	C3	D
Brazil	Total number of decisions (<i>MaxEA</i>)	19	13	25	66	7	4
	No. of decisions without gaps (<i>LSI</i>)	19	13	15	38	7	2
	% of decisions with gaps	-	-	40%	42%	0%	50%
Russia	Total number of decisions (<i>MaxEA</i>)	322	198	652	113	2	0
	No. of decisions without gaps (<i>LSI</i>)	322	198	235	37	0	0
	% of decisions with gaps	-	-	64%	67%	100%	-
India	Total number of decisions (<i>MaxEA</i>)	17	1	55	9	3	0

	No. of decisions without gaps (<i>LSI</i>)	17	1	25	2	1	0
	% of decisions with gaps	-	-	55%	78%	67%	-
South Africa	Total number of decisions (<i>MaxEA</i>)	6	19	6	4	0	1
	No. of decisions without gaps (<i>LSI</i>)	6	19	5	4	0	0
	% of decisions with gaps	-	-	17%	0%	-	100%

The share of decisions in which ‘gaps’ in economic analysis are present is an indicator of the quality of reasoning of the competition authority. The share of decisions based on non-coherent economic analysis for the competition authorities are: 30% for Brazil, 38% for Russia, 46% for India, 6% for South Africa.

The table also indicates that it is rare to see cases with a Full Effects Based (*LSI*=6 or up to *D*=1) analysis. At the other extreme, most of the decisions do not apply a Strict Per Se rule (only *A*=1 or *B*=1, i.e., *LSI*=1 or 2). Some conducts are more prone to a Strict Per Se rule, such as a cartel (*G1*). This may be seen on table 7, where we have the joint distribution of cases in the conduct group and *LSI* in our database.

The above result may obscure the actual legal standard across countries if the composition of the cases differs across countries, as seen on Table 7. To provide a more complete picture of the legal standard in each country, considering country specificities, such as case types, we pursue two empirical strategies. First, a more detailed table with the three dimensions, as in Table 8. Second, regression analysis, where one can simultaneously consider the relative effect of each country and case characteristic on legal standards.

Table 7 – Conduct groups and Legal Standards

	G1	G2	G3	G4		G1	G2	G3	G4
<i>LSI</i> =1 (Strict Per Se)	176	31	121	36	<i>MaxEA</i> =1	176	31	121	36
<i>LSI</i> =2	76	41	29	85	<i>MaxEA</i> =2	76	41	29	85
<i>LSI</i> =3	111	76	32	61	<i>MaxEA</i> =3	381	98	136	123
<i>LSI</i> =4	39	2	21	19	<i>MaxEA</i> =4	115	8	36	33
<i>LSI</i> =5	4	0	3	1	<i>MaxEA</i> =5	4	0	5	3
<i>LSI</i> =6 (Full Eff. Based)	0	0	2	0	<i>MaxEA</i> =6	2	0	3	0

5.1. Typical legal standards in the infringement decisions

Our indicators allow, first, to evaluate the legal standards that competition authorities apply under competition investigation. At the same time, we can explore the variation of legal standards

within conduct groups. This informs about the certainty of legal standards authorities try to achieve and manage to achieve.

We report first the average values of legal standards measured by the highest stage of economic analysis authorities apply *MaxEA*. The value for Brazil (3.31) means that CADE in typical investigation analyzes the market and identifies the theory of harm to competition, reaching criteria C1 in the table above, on average. In Russia, India and South Africa we may expect market delineation in typical case (B1), but there is only fraction of cases where the competition authorities try to develop theory of harm, i.e., few cases with $B1=1$.

In addition to characterizing what is the usual legal standard that the countries use, our data allows us to investigate how coherent the case specific analysis is. The share of gaps in competition analysis reflects the level of coherence and consistency (see Table 7). Overall, this level is not very high. In Brazil and Russia competition authorities skip a step of analysis in about every third decision. With high probability the theory of harm to competition stated does not rely on market analysis; and the harm to consumers might be analyzed without development of the theory of harm to competition. At this step CCSA looks as the most coherent authority, with few skips in the steps of analysis up to the largest investigation criteria used.

Considering legal standard uncertainty, the variation in legal standards (measured by standard deviation) is very high in all the countries. If we treat the average legal standard as expected, deviation of competition agencies from these expected standards is large. In part this may reflect the different LSI used for each type of case, in a composition effect. In part it may reflect actual differences in LSI used for the same case type. Yet looking at the within conduct group variation the variability is comparable to the whole sample variation.

We find even larger differences in the depth of case-specific analysis, if this analysis is consistent and coherent (LSI). In Brazil we expect that in typical case analysis completes at theory of competition harm ($LSI = 3.07$). In contrast, in Russia in typical case we expect only market analysis ($LSI = 1.98$). India and South Africa are between these points.

The analysis of legal standard across different conducts groups allows to explore the differences in LSI across countries. Group 1 consists from the conducts which are illegal *per se* (by object) in all the jurisdictions analyzed. One may be surprised that we observe relatively high level of economic analysis for the cases from group 1. However, we observe *MaxEA* and *LSI* values for *per se illegal conducts* which are high enough. In Russia competition authority even reaches higher legal standards, that is, deeper economic analysis, when investigating horizontal agreements in contrast to vertical. The puzzle of higher *MaxEA* and *LSI* for horizontal agreements is resolved when we consider the nature of evidence. First, the investigation of horizontal agreements requires market boundaries delineations as other conducts do. Second, among

investigations of horizontal agreements, which are presented in the dataset, there are many instances of using and interpreting indirect evidence of collusions. For instance, most of bid rigging conducts in Russia were identified using different types of screening procedures. When indirect evidence is used to establish the fact of bid rigging in procurement, case-specific economic analysis leads to higher legal standard (in fact, to theory of harm elaboration, or $LSI = 3$). At the same time, specific feature of investigations of first group is that in some cases steps of the analysis might be missing. Consider procurement again. In principle, no specific analysis of the market is necessary to identify bid rigging strategies. Last but not least, step C2 (establishing harm for consumers), is not necessary for the conduct group at all. *Per se* illegality assumes presumption of negative welfare impact of the conducts.

In contrast to conduct group 1 (explicit horizontal agreements), investigations in other conduct groups (tacit collusion, vertical restraints, exclusionary abuse of dominance) do not follow *per se illegal* approach. For these types of conduct, both insufficient analysis and missing steps in economic analysis substantially increase the probability of error. Therefore, we also compare average values of legal standards by countries excluding group 1 (see Table 7). Using this approach, the difference between competition authorities becomes more pronounced. In Brazil, in average investigation CADE achieves $MaxEA = 4.05$; that is in a typical case one sees subsequent analysis of a market, theory of competition harm and then theory of consumer harm. There are investigations where analysis goes further – to welfare-enhancing effects and weighing negative and positive effects. Only every twentieth investigation (5%) contains missing step of analysis. Therefore, $LSI = 4$ (analysis up to consumer harm) is achieved, and variation of legal standard is lower, in comparison to investigations of horizontal agreements, *illegal per se*.

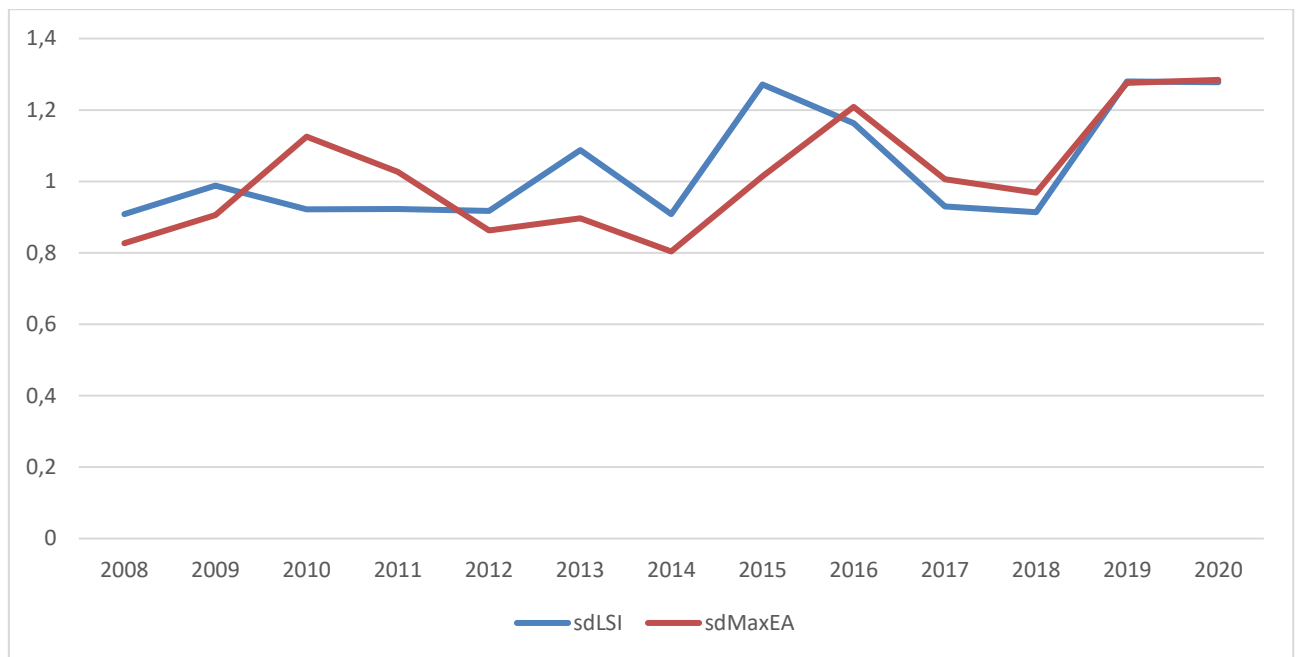
The analysis of different conduct groups allows us to identify, where the approaches of ‘lagging behind’ authorities differ the most from ‘most advanced’. In our case (see Table 7) the source of difference are vertical agreements (Group 3). Development of law and economics and best practice accumulated imply that enforcement towards vertical agreements should be effect-based. According to our dataset, only Brazil is on the way to achieve this standard ($LSI > 4$). In contrast, in Russia typical analysis of vertical agreement doesn’t even include the proper delineation of market affected ($LSI < 2$). India and South Africa do not always achieve the stage of the analyzing the effects on consumer welfare ($LSI < 4$).

Table 7. Indicators of legal standard and legal (un)certainty

	<i>MaxEA</i> – maximum level of economic analysis								Gaps in the analysis (share of observations)				<i>LSI</i> – legal standards authorities achieve							
	Mean				Standard Deviation								Mean				Standard Deviation			
	BR	RU	IN	SA	BR	RU	IN	SA	BR	RU	IN	SA	BR	RU	IN	SA	BR	RU	IN	SA
Group 1 (explicit horizontal agreements)	3.18	2.53	2.52	1.88	1.24	0.97	0.97	0.53	0.34	0.50	0.55	0.00	2.84	1.89	1.78	1.88	1.33	0.96	0.97	0.53
Group 2 (tacit collusion)	-	2.45	3.17	2.00	-	0.81	1.17	1.41	-	0.15	0.50	0.00	-	2.32	2.67	2.00	-	0.80	1.53	1.41
Groups 3 (vertical agreements)	4.44	2.22	4.00	3.63	1.13	1.08	1.00	1.19	0.00	0.38	0.40	0.25	4.44	1.66	3.67	3.33	1.13	0.99	1.15	0.82
Group 4 (abuse of dominance)	3.70	2.49	3.21	4.00	0.82	0.87	0.58	-	0.10	0.30	0.07	0.00	3.67	2.19	3.08	4.00	0.87	0.84	0.28	-
All cases	3.31	2.44	2.76	2.33	1.25	0.97	1.01	1.07	0.30	0.38	0.46	0.06	3.07	1.98	2.33	2.21	1.36	0.94	1.10	0.88
Cases excluding group 1	4.05	2.37	3.36	3.36	1.03	0.96	0.86	1.29	0.05	0.30	0.24	0.18	4.06	2.03	3.11	3.11	1.06	0.93	0.74	1.05

Figure 1 presents the standard deviation of the legal standards indicators *LSI* and *MaxEA*, considering all countries and groups over time. The data suggest that there has not been a decrease in aggregate LS variation. The trend is similar across the two indicators. The increase may have different explanations. It may be the case that countries are diverging in the legal standards used. Alternatively, the proportion of cases across countries or across different types is changing towards more cases with higher variation in LSI, a composition effect. An empirical model is required to take into account these factors simultaneously.

Figure 1. Trends in LS standard deviations



Note – sdLSI (blue line): standard deviation of the *LSI* across all countries and cases, per year. sdMaxEA (red line): standard deviation of the *MaxEA* across all countries and cases, per year.

6. Testing the determinants and evolution of legal standards in BRIS

A central issue for our analysis is cross-BRIS comparison of levels, variation and dynamics of legal standards. We also explore a possible within-country and cross-BRIS convergence of the legal standards, given learning by doing over time from case handling and the intense exchange of experiences across countries, by looking at the standard deviation of our indicator.

6.1. Empirical hypotheses and methodology

We explore the fundamental LSI differentials across the basic characteristics of the analysis, namely, country, type of conduct and time, as well as differences that can be associated with inputs such as the allocated budget. The analysis is done using two types of regression models.

Regression analysis is required to conditionally understand the role of each characteristic on the LSI indicator. This would allow us to provide conclusions about (i) the legal standard differentials applied in antitrust investigations across infringement types. (ii) cross-country differentials of the legal standard, considering the composition effect of the type of infringement cases; and (iii) the role of experience and resources in the level of legal standards.

The latter explores a variable that indicates the number of cases in the specific jurisdiction investigated by the specific time (experience). It informs about learning by doing or the construction of a jurisprudence. Yet the effect of this variable may be positive or negative. Positive if the cumulative number of cases imposes a more careful approach to handling such cases, as well as more experience in setting and applying a legal analysis methodology for the case. On the other hand, the effect may be negative in that after a number of cases, the jurisdiction becomes confident that detailed analysis is less required as the outcome of such cases would be expected. It is an empirical issue to see what is the actual effect of the variable.

We can summarize our analysis in the form of testable empirical hypothesis to be evaluated from the regression analysis output:

Hypothesis 1: There is an increase in the average legal standard applied in antitrust investigations over time.

Hypothesis 2: There is a cross-country convergence of legal standards over time

Hypothesis 3: There is a decrease in within-country variations of legal standards applied in cases on a particular conduct.

Hypothesis 4: There is an increase in consistency of economic analysis applied in antitrust investigations (i.e., the probability of ‘gaps’ decreases).

Hypothesis 5: Resources of competition authorities contribute to increased average legal standards and more consistent economic analysis.

Hypotheses 2 and 3 break down the possible sources of the cross-country convergence (if any), i.e., a reduction in the standard deviation of legal standards. This variation may reduce because average standards across countries are becoming more similar or because within each country the variation of legal standards is decreasing.

We use standard regression tools. It provides coefficients that generate average differentials of LSI across observations and characteristics³¹.

³¹ See for example, Wooldridge, J. (2010). Introductory Econometrics: a modern approach. 6th Ed. Cengage. We also considered the ordered logit model. This method recognizes that the LSI variable is ordinal and the level of analysis or underlying effort or quality across LSI levels may not be constant, as the coding, LSI=1,2,3...6 would suggest. The method predicts the chance of a specific LSI level, given the explanatory variables. It would provide more information than the OLS estimates. As the results, available with the authors, are qualitatively the same for ordered and least squares we focus on the second to ease the exposition. For the ordered logit see, e.g. Cameron, C. and Trivedi, P. (2005) Microeconometrics: Methods and Applications. Cambridge University Press.

The empirical models are as follows. The dependent variable is legal standard applied in the particular case i of conduct type c in jurisdiction j at time t . This is contrasted with a flexible specification with dummies and interactions between categorical case characteristics and with continuous variables. The general form of the regression model is:

$$LS_{icjt} = \alpha + \sum_c \beta_c I\{\text{conduct group} = c\} + \sum_j \gamma_j I\{\text{country} = j\} + \sum_{c,j} \zeta_{cj} [I\{\text{country} = j\} * I\{\text{conduct group} = c\}] + \rho \text{time}_t + \sum_j \eta_j [I\{\text{country} = j\} * \text{time}_t] + \sum_c \delta_c [I\{\text{conduct group} = c\} * \text{time}_t] + \varepsilon_{icjt} \quad (1a)$$

$$LS_{icjt} = \alpha + \sum_c \beta_c I\{\text{conduct group} = c\} + \sum_j \gamma_j I\{\text{country} = j\} + \sum_{c,j} \zeta_{cj} [I\{\text{country} = j\} * I\{\text{conduct group} = c\}] + \rho \text{experience}_{jt} + \theta X_{cjt} + \sum_j \eta_j [I\{\text{country} = j\} * \text{experience}_{jt}] + \sum_c \delta_c [I\{\text{conduct group} = c\} * \text{experience}_{jt}] + \sum_j \mu_j [I\{\text{country} = j\} * X_{cjt}] + \varepsilon_{icjt} \quad (1b)$$

where $c=[1,4]$ is the conduct group as in Table 4, $j=\{\text{Brazil, Russia, India, South Africa}\}$ is the jurisdiction/country, LS is the legal standard (measured by LSI or $MaxEA$) applied in the particular decision, $I\{A\}$ is the indicator of the event A (1 if true, zero if false), time reflects a yearly linear trend and experience is measured by the (logarithm of) number of cases on a particular conduct decided by a particular competition authority in the past. The vector of explanatory variables includes the variables *funding* and *workload*. *Funding* is measured by the budgeted in thousand dollars divided by the number of cases and *workload*, the number of employees divided by the number of cases. These explanatory variables are in logs, so that their effect is from a percentage change.

The first specification is simpler, where only a time trend is used, in addition to country and conduct dummies. The time trend may provide information on the direction of the average legal standards, but may confound the effects of different variables, such as experience and budget that tend to grow over time. The second specification sheds light on the effect of resources and experience over time.

A central part of our analysis is to understand cross-country differences across LSI . This is why we interact conduct group, experience, funding and workload with country. Their statistical non-significance would mean that competition authorities have similar vision on what type of conduct requires application of higher legal standard in antitrust investigation. The interaction of the explanatory and conduct group variables with country allows us to statistically test the hypothesis that countries do not differ in their legal standards for antitrust investigation.

The model uses one less coefficient for each category, to avoid the dummy trap. The omitted categories are Conduct Group=G1 (Cartel) and Country=Brazil. The estimated coefficients must be interpreted as differential of the country and conduct group with respect to Brazil and G1.

Hypothesis 1 suggests the trend coefficients are positive in model (1a). To test the hypotheses 2 and 3 we calculate standard deviation of *LSI* and *MaxEA* (a) for each combination of country-conduct-year (*sdLS_{cjt}*); and (b) for each combination of conduct-year (*sdLS_{ct}*). Then the indicators of inter-country (a) and within-country (b) variation in legal standards are used as a dependent variable in a regression aimed to assess the presence of convergence in legal standards trend:

$$sdLS_{cjt} = \alpha + \sum_c \beta_c I\{\text{conduct group} = c\} + \sum_j \gamma_j I\{\text{country} = j\} + \rho \text{time}_t + \sum_j \eta_j [I\{\text{country} = j\} * \text{time}_t] + \sum_c \delta_c [I\{\text{conduct group} = c\} * \text{time}_t] + \varepsilon_{ij} \quad (2a)$$

$$sdLS_{ct} = \alpha + \sum_c \beta_c I\{\text{conduct group} = c\} + \rho \text{time}_t + \sum_c \delta_c [I\{\text{conduct group} = c\} * \text{time}_t] + \varepsilon_{ij} \quad (2b)$$

Regarding hypothesis 4 (and 5), the relative impact of the explanatory variables on the probability of ‘gaps’ is estimated by the following Probit regression model.

$$P(\text{gap}_{icjt} = 1|Z) = \Phi_{ij} [\alpha + \theta \text{MaxEA}_{icjt} + \sum_c \beta_c I\{\text{conduct group} = c\} + \sum_j \gamma_j I\{\text{country} = j\} + \sum_{c,j} \zeta_{cj} [I\{\text{country} = j\} * I\{\text{conduct group} = c\}] + \rho \text{time}_t + \sum_j \eta_j [I\{\text{country} = j\} * \text{time}_t] + \sum_c \delta_c [I\{\text{conduct group} = c\} * \text{time}_t]] \quad (3a)$$

$$P(\text{gap}_{icjt} = 1|Z) = \Phi_{ij} \left[\alpha + \theta \text{MaxEA}_{icjt} + \sum_c \beta_c I\{\text{conduct group} = c\} + \sum_j \gamma_j I\{\text{country} = j\} + \sum_{c,j} \zeta_{cj} [I\{\text{country} = j\} * I\{\text{conduct group} = c\}] + \rho \text{experience}_{jt} + \sum_j \eta_j [I\{\text{country} = j\} * \text{experience}_{cjt}] + \sum_c \delta_c [I\{\text{conduct group} = c\} * \text{experience}_{cjt}] + \theta X_{cjt} + \sum_j \varphi_j [I\{\text{country} = j\} * X_{cjt}] \right] \quad (3b)$$

where $P(\text{gap}_{icjt}=1|Z)$ indicates the probability that a ‘gap’ appears in economic analysis applied by competition authority in the jurisdiction/country *j*, when investigating an antitrust case on the conduct *c*. One more control variable we use here is *MaxEA*. It is included in the regression model (3) based on the fact that the higher the maximum level of economic analysis the greater the probability of gaps. For example, is *LSI*=1, there are no gaps by construction. If *MaxEA*=3, there

can be one gap ($B=0$), but if $MaxEA=5$, where can be gaps due to $B=0$ or $C1=0$ or $C2=0$ or any combination.

6.2. Econometric analysis results

Regression models (1a) and (1b) estimates are presented in the Appendix. The estimates consider the two specifications, one with trend only and another with the vector of control variables X . The results are presented for both measures of legal standard, LSI and $MaxEA$. As the LSI measure does not allow for gaps in the analysis, the number of observations is only 3/5 of the $MaxEA$ estimates. As the model is nearly saturated, with many dummies' interactions and control variables, the country and group fixed effects as well as their cross effects are not directly interpretable from the regression output, thus we do not discuss specific coefficient estimates.

Effects of explanatory variables (time, experience, funding and workload) are expected to be country- and/or group-specific. They can be found as a combination of the baseline country-group combination (taken alphabetically, so Brazil and G1) and the corresponding cross effect. Table 9 presents the estimates and the results of Wald tests for their statistical significance. Our specifications do not consider funding or workload effects by group as it is not possible to segregate the resources by type of conduct or case. On the other hand, the experience variable is calculated by country and conduct and the time variable is a general variable that controls all trending factors that may influence either country or group legal standards.

According to the results of specification 1 of the regression model estimation both LSI and $MaxEA$ LS indicators decrease with time in Brazil and India. In Russia LSI does not appear to have any statistically significant trend while $MaxEA$ decreases. This means that the level of consistent economic analysis stays stable and the frequency of gaps decreases. In South Africa we observe a negative trend in LSI and stable $MaxEA$. This suggests that the quality of economic analysis in South Africa decreases as the level of consistent analysis becomes lower with higher probability of gaps. Results show as well that both LS indicators decrease and in all conduct groups but G3 (vertical agreements). Thus, in general, we reject the hypothesis 1 as there is no evidence that the average legal standard applied in antitrust investigations increases over time.

To test the effects of resources and workload of competition agencies on LS they apply we estimate specification 2 of the regression model. The effect of experience on both LS indicator is either negative or not significant depending on the particular country and conduct group. It is negative for India and for G2 and non-significant for the other countries and conducts. This reflects that learning by doing, if present, does not contribute to the application of higher LS by competition authorities. This conclusion is consistent with the revealed time trends described above.

The estimated effects of resources are not clear, although the effects have the same signs comparing LSI and MaxEA. It was expected to reveal that better funding supports deeper economic analysis. This positive effect is significant in Russia for both LS indicators and in India for MaxEA. On the other hand, funding provides negative effect on both LS indicators in Brazil which is counter-intuitive. The effect of workload is found to be statistically not significant but for MaxEA in Russia which is, again, the opposite to what could be expected. It appears that a larger volume of cases opened per year for a given set of staff does not lead to a lowering of legal standard. In all, the findings on the selected resources and congestion suggest that these resources are not key factors that determine LS applied by CA, given the recent experience of BRIS countries.

Table 9. Calculated country and group effects of explanatory variables and Wald tests for their statistical significance – LSI and MaxEA

LS	variable	Estimated effects of explanatory variables (Prob>F)							
		By countries				By groups			
		BR	RU	IN	SA	G1	G2	G3	G4
Model 1a									
LSI	Time	-0.11* (0.064)	-0.01 (0.568)	-0.13*** (0.005)	-0.05** (0.036)	-0.11* (0.064)	-0.23*** (0.001)	-0.04 (0.558)	-0.13* (0.054)
MaxEA	Time	-0.14*** (0.007)	-0.08*** (0.000)	-0.09** (0.011)	-0.01 (0.782)	-0.14*** (0.007)	-0.18*** (0.002)	-0.07 (0.196)	-0.14** (0.013)
Model 1b									
LSI	Experience	-0.44 (0.136)	-0.02 (0.762)	-0.66*** (0.000)	0.03 (0.876)	-0.44 (0.136)	-0.65** (0.042)	-0.40 (0.202)	-0.43 (0.174)
	Funding	-1.70*** (0.009)	0.40* (0.076)	1.61 (0.321)	1.70 (0.319)				
	Workload	0.79 (0.435)	0.07 (0.497)	-0.84 (0.440)	-0.41 (0.498)				
MaxEA	Experience	-0.38 (0.126)	-0.02 (0.727)	-0.66*** (0.000)	-0.05 (0.771)	-0.38 (0.126)	-0.54** (0.043)	-0.43 (0.101)	-0.47* (0.073)
	Funding	-1.29*** (0.008)	0.43** (0.015)	1.55** (0.026)	1.69 (0.122)				
	Workload	0.78 (0.378)	0.45*** (0.000)	-0.57 (0.138)	-2.09 (0.516)				

Focusing on hypotheses 2 and 3, we explore the standard deviation of the LSI indicators. The dependent variable is now the standard deviation calculated for each country-conduct-time cell. The models are based on a smaller combination of all conduct-jurisdiction-period cell and the standard deviation can only be calculated if there are at least two cases per cell (see Table 10). In addition, the standard deviation may be zero, which is informative. There are a good number of country-conduct-year combinations with no variation in LSI (13 out of 70), yielding a zero standard deviation, and 34 combinations country-conduct-year with only one case. As for *MaxEA*, we have 12 out of 78 country-conduct-year combinations with the same *MaxEA* and 26 with only one case.

Table 10. Number of years for which standard deviation can be calculated by country, by conduct group

	sdLSI					sdMaxEA				
	G1	G2	G3	G4	Total	G1	G2	G3	G4	Total
Brazil	8		2	3	13	8		2	4	14
Russia	10	9	11	11	41	10	11	11	11	43
India	6			3	9	9		1	3	13
SA	6	1			7	6	1	1		8
Total	30	10	13	17	70	33	12	15	18	78

The results of regression models (2a) and (2b) estimation are presented in the Appendix. In Table 11 we summarize the time effect estimates by countries and groups and the results of Wald tests for their statistical significance.

The results of the model (2a) estimation do not yield the convergence of LS within country/group over time as the time trends are not negative. The time trends in both LS indicators by countries are either non-significant (Brazil and Russia) or positive (India and South Africa). The trends by groups are non-significant excepting for LSI for the group of abuse of dominance cases (G4) which is negative. This is the only evidence in favor of hypothesis 2.

The results of estimation of regression model (2b) do not yield the inter-country convergence of LS within conduct groups over time as well. The only statistically significant time trend in LSI for G3 conduct group (vertical agreements) is positive. Thus, we reject the hypothesis 3 as well.

Table 11. Calculated country and group effects of time and Wald tests for their statistical significance – Standard Deviation of LSI and MaxEA

LS	variable	Estimated effects of explanatory variables (Prob>F)							
		By countries				By groups			
		BR	RU	IN	SA	G1	G2	G3	G4
Model 2a									
LSI	Time	-0.06 (0.201)	-0.01 (0.193)	0.13*** (0.005)	0.10*** (0.000)	-0.06 (0.201)	-0.06 (0.264)	-0.04 (0.467)	-0.11** (0.030)
MaxEA	Time	-0.00 (0.969)	-0.03 (0.369)	0.13*** (0.001)	0.10*** (0.000)	-0.00 (0.969)	0.02 (0.779)	0.01 (0.830)	-0.01 (0.824)
Model 2b									
LSI	Time					-0.01 (0.642)	0.02 (0.280)	0.05** (0.014)	-0.01 (0.494)
MaxEA	Time					-0.01 (0.617)	0.03 (0.241)	0.02 (0.105)	0.01 (0.560)

Last, when considering our hypothesis 4, an increase in consistency of economic analysis, we turn our attention to regression models (3a) and (3b), where the dependent variable is the gap in the logic of economic analysis, a binary indicator of differences between *LSI* and *MaxEA*. Results of the Probit estimation are presented in the Appendix as well. In Table 12 we summarize the effects of explanatory variables by countries and groups and the results of Wald tests for their statistical significance.

Table 12. Calculated country and group effects of explanatory variables and Wald tests for their statistical significance – Gaps in economic analysis

variable	Estimated effects of explanatory variables (Prob>F)							
	By countries				By groups			
	BR	RU	IN	SA	G1	G2	G3	G4
Model 1a								
Time	0.02 (0.741)	-0.03 (0.159)	0.02 (0.720)	0.01 (0.886)	0.02 (0.741)	0.04 (0.725)	-0.11 (0.206)	-0.17* (0.055)
Model 1b								

Experience	-0.04 (0.917)	0.73*** (0.000)	0.51* (0.079)	-7.62 (0.213)	-0.04 (0.917)	-0.72* (0.099)	-0.80* (0.053)	-1.10*** (0.009)
Funding	-0.17 (0.826)	-0.47 (0.145)	-0.53 (0.187)	7.18 (0.252)				
Workload	-0.02 (0.988)	1.68*** (0.000)	-0.58 (0.468)	-9.42 (0.245)				

From the table in the appendix, as expected, the probability of gap increases with *MaxEA* which is the highest level of economic analysis applied by competition authority. From table 12 it is possible to see that there is minor evidence that probability of gaps decreases over time. The trend is statistically significant for abuse of dominance cases (G4).

The most interesting result is that the probability of gaps decreases with experience for most conduct groups of cases (G2, G3 and G4). This should reflect increase in consistency of economic analysis. At the same time, we observe the opposite effect on the level of some countries. The probability of gaps increases in Russia and India and does not change in Brazil and South Africa. One possible explanation of the result given the groups' trends is that the relative number of cases of the types that require higher LS accompanied with higher probability of gaps increases.

Looking at the bottom part of table 12, it seems that more funding is not associated with an increase in the consistency of economic analysis, i.e., fewer gaps in cases legal standards indicators. The workload of the staff of a competition authority increases the probability of gaps for Russia, but not for other countries. Conversely, better staffed (less work loaded) agencies over time may experience an improvement in the consistency of economic analysis. Overall, the evidence does not suggest that resources explain gaps in economic analysis applied on cases across authorities.

Concluding comments

In this paper we present an empirical analysis of legal standards across several developing countries. The analysis exploits a recently developed analytical tool that enables quantitative assessment and cross-country comparisons of legal standards applied by competition authorities (Katsoulacos et al. 2019).

Following the methodology described in this paper two Legal Standard indicators – *LSI* and *MaxEA* – are constructed relying on information extracted from infringement decisions reached by the competition authorities of Brazil, Russia, India and South Africa. The suggested method to measure the scale of effect-based enforcement overcomes the limitations of competition

law indices which assess competition law ‘from the book’. The study of actual economic analysis and logic used to provide arguments in antitrust investigations sheds light on the actual workings of competition policy institutions in the selected developing countries.

The analysis empirically contributes to important discussions on the scope of effect-based enforcement, evidentiary standards, and the demand for economics in competition investigation, particularly to comparative competition law and economics. Our rich data set, covering about a decade of cases across jurisdictions allows us to obtain several important conclusions.

First, LS levels seem to be higher in Brazil and India compared to Russia and South Africa. A possible explanation of the result is related to differences in institutional design of competition law enforcement. South Africa is the country with prosecutorial model. Thus, the competition authority being the prosecutor is not motivated in analysis of efficiencies (C3 and D economic analysis) which is aimed to justify companies’ business practice. Such analysis is to be provided by the accused violators during the adversarial process in Competition Tribunal. The specificity of administrative competition enforcement model in Russia is the absence of separation between investigative and decision-making functions. This demotivates the authority to apply comprehensive economic analysis and results in accusatorial bias. To protect their interests, companies appeal the CA decisions in commercial courts, thus judicial review is the predominant stage of an antitrust case consideration at which efficiencies are analyzed. In contrast, in Brazil and India the adversarial process takes place within the competition authorities as investigative and decision-making functions are separated, they are performed by different sub-divisions of the institutions. This reinforces the need to consider all aspects of the case, including efficiencies and balancing.

Second, there is a reduction in one or both LS indicators over time in all countries and for all conduct groups but vertical agreements (G3). LS does not increase with experience of competition authorities as well. Rather, the effect is negative for India and concerted practice (G2). Thus, we reject the hypothesis 1 and conclude that there is no increase in the average legal standard applied in antitrust investigations over time.

Third, the results of analysis do not yield the cross-country or within-country convergence of LS within conduct groups over time (hypotheses 2 and 3). There is no catching up effect, or convergence towards ‘internationally recognized best practice’ or ‘optimal legal standard’ within or between countries. The variation of LSI within a jurisdiction and for a specific antitrust case does not appear to be decreasing over time, it may even be increasing in India and South Africa. There is no cross-country convergence either. The choice of legal standard under investigation of a particular case stays an important source of divergence of competition enforcement between jurisdictions.

Fourth, there is some evidence in favor of the hypothesis 4. We observe an increase in the coherence of economic analysis (less chance of gaps) over time for abuse of dominance cases (G4) and decrease in the probability of gaps with experience for all conduct groups but cartels (G1). At the same time, the effect of experience on country level goes in another direction and suggest an increase of gaps with experience. This might be related to the change in the focus of antitrust authorities in favor of types of cases that are associated with higher chance of gaps in economic analysis. This statement, however, requires further investigation.

Fifth, there are several findings that reflect the role of resources of competition agencies. The effect of funding on the LS level is not clear across countries. It is found to be positive for Russia and India, which is reasonable. At the same time more funding results in lower LS in Brazil which is counter-intuitive. The estimated effect of workload on LS is found to be statistically not significant but for MaxEA in Russia which is, again, the opposite to what could be expected. Thus, resources are not the key factors that determine the level of LS. However, they might affect the quality of economic analysis. It is revealed that the workload of competition authority officers increases the probability of gaps in Russia. This suggests that multitasking does not support consistency of economic analysis.

Table A1. Results of OLS estimation of regression models (1a) and (1b)

	Dependent variable:			
	<i>LSI</i>		<i>MaxEA</i>	
	Model 1a (a)	Model 1b (b)	Model 1a (c)	Model 1b (d)
Constant	4.54*** (0.93)	-1.60 (2.15)	5.20*** (0.73)	-0.23 (1.40)
Conduct group fixed effects	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes
Cross country-group effects	yes	yes	yes	yes
Time trend				
time	-0.11* (0.06)		-0.14*** (0.05)	
time*Russia	0.10 (0.06)		0.06 (0.06)	
time*India	-0.02 (0.08)		0.04 (0.06)	
time*SA	0.06 (0.06)		0.13** (0.06)	
time*G2	-0.12*** (0.03)		-0.04 (0.03)	
time*G3	0.07*** (0.03)		0.06** (0.02)	
time*G4	-0.01 (0.03)		0.00 (0.02)	
Experience				
experience		-0.44 (0.30)		-0.38 (0.25)
experience*Russia		0.42 (0.31)		0.36 (0.26)
experience*India		-0.22 (0.33)		-0.28 (0.29)
experience*SA		0.47 (0.35)		0.33 (0.30)
experience *G2		-0.21* (0.11)		-0.16* (0.10)
experience *G3		0.04 (0.10)		-0.05 (0.08)
experience *G4		0.01 (0.10)		-0.09 (0.08)
Funding (ln budget/staff)				
funding		-1.70*** (0.65)		-1.28*** (0.49)
funding*Russia		2.10*** (0.69)		1.72*** (0.52)
funding*India		2.06*** (0.74)		1.92*** (0.57)
funding*SA		2.14*** (0.79)		2.06*** (0.70)
Workload (ln cases/staff)				
workload		0.79 (1.01)		0.78 (0.88)
workload*Russia		-0.72 (1.02)		-0.32 (0.88)
workload*India		-0.40 (1.13)		-0.19 (0.96)
workload*SA		0.03 (1.58)		-1.71 (1.68)
Number of observations	966	966	1542	1542
R2-squared	0.2288	0.2274	0.1456	0.1761

Standard deviations in parentheses. Statistical significance: * - 10%, ** - 5%, *** - 1%

Table A2. Results of OLS estimation of regression model (2a)

	Dependent variable	
	sdLSI	sdMaxEA
Constant	1.80** (0.71)	0.89 (0.82)
Conduct group fixed effects	yes	yes
Country fixed effects	yes	yes
Time trend		
time	-0.06 (0.05)	-0.00 (0.05)
time*Russia	0.05 (0.05)	-0.03 (0.06)
time*India	0.18*** (0.05)	0.13* (0.06)
time*SA	0.16*** (0.05)	0.11* (0.06)
time*G2	0.00 (0.03)	0.02 (0.04)
time*G3	0.02 (0.03)	0.02 (0.04)
time*G4	-0.05*** (0.01)	-0.01 (0.03)
Number of observations	70	78
R2-squared	0.4904	0.3161

Standard deviations in parentheses. Statistical significance: * - 10%, ** - 5%, *** - 1%

Table A3. Results of OLS estimation of regression model (2b)

	Dependent variable	
	sdLSI	sdMaxEA
Constant	1.10*** (0.20)	1.09*** (0.33)
Conduct group fixed effects	yes	yes
Time trend		
time	-0.01 (0.01)	-0.01 (0.02)
time*G2	0.03 (0.03)	0.04 (0.03)
time*G3	0.06** (0.02)	0.03 (0.02)
time*G4	-0.00 (0.02)	0.02 (0.03)
Number of observations	44	47
R2-squared	0.3218	0.3196

Standard deviations in parentheses. Statistical significance: * - 10%, ** - 5%, *** - 1%

Table A4 – Results of probit models (3a) and (3b) estimation

	Model 3a	Model 3b
Constant	-4.82*** (1.08)	-4.81** (2.22)
MaxEA	1.14*** (0.06)	1.13*** (0.06)
Conduct group fixed effects	yes	yes
Country fixed effects	yes	yes
Cross country-group effects	yes	yes
Time trend		
time	-0.02 (0.02)	
time*Russia	-0.06 (0.07)	
time*India	-0.00 (0.09)	
time*SA	-0.01 (0.12)	
time*G2	0.01 (0.08)	
time*G3	-0.13*** (0.05)	
time*G4	-0.19*** (0.05)	
Experience		
experience		-0.04 (0.39)
experience*Russia		0.78* (0.41)
experience*India		0.55 (0.49)
experience*SA		-7.58 (6.12)
experience *G2		-0.68*** (0.19)
experience *G3		-0.76*** (0.13)
experience *G4		-1.06*** (0.15)
Funding (ln budget/staff)		
funding		-0.17 (0.75)
funding*Russia		-0.30 (0.82)
funding*India		-0.49 (0.90)
funding*SA		7.22 (6.21)
Workload (ln cases/staff)		
workload		-0.02 (1.44)
workload*Russia		1.70 (0.46)
workload*India		-0.54 (1.63)
workload*SA		-9.38 (8.21)
Number of observations	1539	1539
Pseudo R2	0.3946	0.4305

Standard deviations in parentheses. Statistical significance: * - 10%, ** - 5%, *** - 1%

Notes: Dummies Country*G2 omitted as Brazil nor India have such cases and all South African cases (2 cases) have gaps. South Africa*G4 omitted as there is only a single case.