2018

Competition Law Around the World from 1889 to 2010: The Competition Law Index

Anu Bradford
Columbia Law School, abradf@law.columbia.edu

Adam S. Chilton
University of Chicago Law School, adamchilton@uchicago.edu

COMPETITION LAW AROUND THE WORLD FROM 1889 TO 2010: THE COMPETITION LAW INDEX

Anu Bradford[1] & Adam S. Chilton[2]

August 17, 2018

Abstract. Competition laws have become a mainstay of regulation in market economies today. At the same time, past efforts to study the drivers or effects of these laws have been hampered by the lack of systematic measures of these laws across a wide range of years or countries. In this paper, we draw on new data on the evolution of competition laws to create a novel Competition Law Index (the "CLI") that measures the stringency of competition regulation from 1889 to 2010. We then employ the CLI to examine trends in the intensity of competition regulation over time and across key countries. We also use our data to create several alternative indexes of competition law that may be appropriate for specific research applications. In doing so, we hope to demonstrate how the CLI can facilitate new empirical research on comparative and international competition law.

Keywords: Competition Law, Antitrust Law, Antitrust, Comparative Law

JEL Codes: K21, L30, L49

[1] Anu Bradford, Henry L. Moses Professor of Law and International Organization, Columbia Law School (abradf@law.columbia.edu).

[2] Adam S. Chilton, Assistant Professor of Law and Walter Mander Research Scholar (adamchilton@uchicago.edu).

We gratefully acknowledge the outstanding work of over seventy Columbia Law School students who helped us retrieve, review, and process the data used in the construction of the CLI. We also received helpful comments from several colleagues. We are particularly grateful for the feedback we received from Cristiana Vitale and other participants of the Conference on Law, Competition & Markets in Paris in June 2017. This research was made possible by financial support from the National Science Foundation under Grants Nos. 1228453 and 1228483, which funded the first phase of the data gathering. The coding was subsequently expanded with the generous support of the Columbia Global Policy Initiative and with the help of additional financial support from Columbia Law School.

1. INTRODUCTION

Competition laws have become a mainstay of regulation in market economies. By 2010, 126 countries had adopted a competition law, most of them within the last three decades. These countries combined produce roughly 95% of the world GDP, further illustrating the significance of competition policy in regulating global markets. But despite the rise in the importance of competition law around the world, cross-national measures of competition law have remained limited. Most existing cross-national research on competition regulation relies on a binary coding of whether a competition law exists or not, which ignores significant variation in the actual content of those laws.[1] Although a few scholars have attempted to capture more detailed content of the laws,[2] the magnitude of the tasks has led most researchers to build datasets that rely on small samples of countries or years.[3] The result is that there has not been a comprehensive measure of competition laws across a wide range of countries and years, which in turn compromises efforts to reliably evaluate the origins and effects of competition law.

In this paper, we introduce a novel Competition Law Index (the "CLI") that measures the stringency of competition regulation around the world for over a century—from 1889 to 2010. The CLI quantifies the key elements of the authority granted to regulate competition and the substance of competition laws that are in force in each jurisdiction in each year since the country introduced its first competition law. These elements are aggregated into an overall index that can be used to measure the intensity of competition regulation—or, to put it differently, the magnitude of the "regulatory risk" that firms face when they compete on any given market.[4] The CLI thus

[1] *See*, *e.g.*, Jerg Gutmann & Stefan Voigt, *Lending a Hand to the Invisible Hand? Assessing the Effects of Newly Enacted Competition Laws* (Feb. 8, 2014) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2392780 (last visited Jan. 2, 2017); Hiau Looi Kee & Bernard Hoekman, *Imports, Entry and Competition Law as Market Disciplines*, 51 EUR. ECON. REV. 831, 856 (2007).

[2] *See* Keith N. Hylton & Fei Deng, *Antitrust Around the World: An Empirical Analysis of the Scope of Competition Laws and Their Effects*, 74 ANTITRUST L.J. 271, 315 (2007); Michael Nicholson, *An Antitrust Law Index for Empirical Analysis of International Competition Policy*, 4 J. COMPETITION L. & ECON. 1009 (2008).

[3] For example, Hylton & Deng restrict their analysis to years 2001-2004, and Nicholson to year 2003. Hylton & Deng, *supra* note 2, at 280; Nicholson; *supra* note 2, at 1021. Others restrict the sample size. *See, e.g.*, Joseph A. Clougherty, *Competition Policy Trends and Economic Growth: Cross-National Empirical Evidence*, 17 INT'L J. ECON. BUS. 111, 125 (2010) (drawing data from 32 countries and focusing on a single variable—number of merger notifications); Kee & Hoekman, *supra* note 1 (relying on a sample of 42 countries). *See also infra* Part 7.

[4] The CLI is not meant to serve as a ranking of competition laws in terms of quality, appropriateness, or effectiveness. Instead, the CLI suggests that, that holding enforcement levels equal, firms face higher regulatory risk when countries have wider-ranging competition laws. As a result, higher values of the CLI are associated with higher regulatory risk, but higher

will allow for cross-national time-series research on competition law to proceed with a new empirical foundation.

Our index draws on a novel dataset that we have built over the past six years.[5] Our dataset incorporates information from 123 of the 126 countries that had a competition law in place by 2010.[6] For each country, we include all competition laws starting from the year when their first competition law was adopted. In total, we coded 700 individual laws across over 100 variables.[7] While we found some relevant provisions from laws that resemble modern competition laws all the way back to England's *Statute of Monopolies* of 1623 and France's *Le Chapelier Law* of 1791, and included those into our dataset, we start our index in 1889 when Canada adopted what is widely considered to be the first comprehensive competition statute in the world. From that year on, our data provides an annually adjusted CLI score for all countries in the world until the year 2010.[8] The CLI, and the other indexes we introduce in this paper, are available for download at our project website: www.comparativecompetitionlaw.org.

We are not the first to recognize the need to quantify competition regimes around the world.[9] Yet the existing efforts to collect and aggregate these data are significantly more limited in either coverage of countries, time, or scope. While valuable, they also have certain shortcomings that prompted us to launch this effort on our own. Our CLI bears closest resemblance to the index constructed by Keith Hylton and Fei Deng, whose "Antitrust Scope Index" builds on the "Antitrust Law Index" introduced by Michael Nicholson.[10] However, while the Hylton-Deng Index is geographically expansive in that it includes 102 countries, it only covers the years 2001-2004. The specific elements included in their index also differ from those of our CLI. Similarly,

values of the CLI are not necessarily associated with "better" competition laws. For a longer discussion of the philosophy of the CLI, *see infra* Part 2.

[5] *See* Anu Bradford, Adam Chilton, Christopher Megaw, & Nathaniel Sokol, *Competition Law Gone Global: Introducing the Comparative Competition Law and Enforcement Datasets*, JOURNAL OF EMPIRICAL LEGAL STUDIES (forthcoming).

[6] The three countries where we were unable to identify the laws or analyze them for linguistic reasons are: Djibouti, Faroe Islands, and Iran.

[7] The total of 700 laws includes 24 laws from 5 regional organization. We discuss the role of regional organizations in competition law more in Part 6.3

[8] We produced a CLI score for all countries in the world, despite the fact that not all countries have competition law, by coding countries without a law as having a score of "0."

[9] We review the relevant literature in Part 7.

[10] *See* Hylton & Deng, *supra* note 2; Nicholson; *supra* note 2.

the Nicholson index covers 52 jurisdictions but focuses on a single year only, 2003. That said, those early efforts to quantify competition laws remain path-breaking contributions and a source of inspiration for a study like ours. These data collector efforts remain a resource that scholars should consult and consider using in addition to our own.[11]

We begin, in Part 2, by explaining the philosophy guiding the construction of the CLI. In Part 3, we discuss the data that provide the foundation for the index. In Part 4, we explain how we construct the index, detailing the relative significance of each component of the law and their relative weight in the overall index. In Part 5, we introduce the index by showing the CLI scores over time and by country. In Part 6, we present four alternative versions of the index that we can calculate with our data and that may serve specific research questions. In Part 7, we compare our index to other indexes that have been developed previously. Finally, in Part 8, we briefly conclude by discussing potential applications of our index and ways it can advance empirical scholarship on comparative competition law.

2. THE PHILOSOPHY GUIDING THE COMPETITION LAW INDEX

The goal of the CLI is to provide a measure of the intensity of competition regulation for as many jurisdictions and for as long a time period as possible. To do so, the CLI is based on a new coding of the elements of countries' competition laws. The more types of behaviors the law prohibits or the more extensive remedies the law entails, the higher the CLI. At the same time, the more defenses and exemptions the law provides, the lower the CLI.[12] When designing the CLI in this way, we made two important decisions: (1) focusing on law on the books and (2) coding the presence of key provisions instead of trying to measure competition policies against an optimal policy of some form. We will discuss each of these decisions below. Additionally, we will also discuss some limitations of our approach.

---

[11] The Scope Index is available at the "AntitrustWorldWiki", *available at* <http://www.antitrustworldwiki.com/antitrustwiki/index.php/Main_Page> (last visited August 13, 2018).

[12] In terms of the analytical logic guiding our index construction, the CLI is similar to those developed by Keith Hylton & Fei Deng as well as Michael Nicholson. *See* Hylton & Deng, *supra* note 2; Nicholson; *supra* note 2. These authors also measure the "scope" or the "net" of competition laws and aggregate the various prohibitions while doing so. We also follow their approach in that we deduct efficiencies from the score that reflects the prohibitions. However, as we discuss in Part 5, important differences exist between the CLI and those constructed by these other authors.

2.1. Law on The Books

The index focuses on competition laws on the books—in other words, the index is based on competition law statutes, only. More specifically, the CLI is based on the coding of general competition laws and sectoral regulations containing competition provisions or other laws such as constitutions or criminal laws to the extent they regulate competition or provide sanctions for anticompetitive behavior. Although there are other ways to measure regulations across countries, coding countries' laws is an accepted method of evaluating legal regimes that we believe has several advantages for measuring competition law.[13] The CLI thus attempts to measure the legal framework in place for regulating market competition based on formal laws.[14]

There are three things worth noting about the decision to focus on statutes. First, the CLI does not take account of case law. This might seem like a significant omission, especially for the United States competition law community. However, we believe this is a defensible and practical approach because few countries outside the United States have active courts that generate new competition rules or modify statutes to a degree that would influence our coding.[15] To verify this claim, we conducted an expert survey of competition law professors and practitioners from around the world. In total, 166 experts from 86 countries completed our survey. Of those countries, our results suggest that in only twelve jurisdictions do "courts play an extensive role" in the development of competition law (that is, "courts have the power to change the scope of competition law and frequently do so"). In another two jurisdictions, the experts described the role of courts as "large" (that is, "courts have the power to change the scope of competition statues and sometimes do so"). Thus, while our index is derived from competition statutes only, it provides a near-comprehensive proxy for the intensity of competition law in each country.

[13] For example, the OECD Market Regulatory Index is based on coding laws and regulations and not the enforcement or effectiveness of those regulations. For more information, see http://www.oecd.org/eco/growth/indicatorsofproductmarketregulationhomepage.htm (last visited August 13, 2018).

[14] We have separately collected data on competition enforcement resources that can potentially be used to complement the CLI when studying global competition policy. *See* Bradford et al., *supra* note 5.

[15] Although the United States is an outlier in the extent to which the courts play a role in developing competition doctrine, we recognize that it is an important outlier given the size of its market and its role as one of the most important competition jurisdictions in the world. We have therefore complemented our statutory coding for the US by separately coding all the key court cases that allow for the construction of an alternative index for the US, which accounts for the case law as well. This adjusted index can substitute the statutory index for the US in an analysis whenever desirable and justified.

Second, the CLI does not take account of the resources or efforts countries put into enforcing their competition laws. It is, of course, possible that countries may have a strict law on the books, but that in practice the country expends no effort enforcing the law. In these cases, relying simply on a country's law on the books may overstate the stringency of the country's competition law regime. However, we decided that focusing on the law on the books for the CLI was the only practical way to build a comprehensive cross-sectional time-series dataset of competition policies around the world. This is because enforcement data is difficult, if not impossible, to obtain for a large number of countries and years. As part of our broader data collection efforts, we tried to collect information on the enforcement activities and resources of every country with a competition law regime.[16] After extensive efforts to comb publicly available data and directly contact antitrust agencies around the world, we were able to obtain at least some data on 112 antitrust agencies from 100 countries. But these data are only available for roughly a decade (2000-2010) for most jurisdictions. This experience made us realize that developing a measure of competition policy for nearly all countries that incorporates enforcement resources directly into the index is simply not feasible (or, at least, beyond our data collection abilities). This is why we decided to focus exclusively on law on the books while developing the CLI.

Third, we elected to base our measure of competition policy on the coding of legal statutes instead of surveys. One way that the stringency of competition law around the world has been measured is through surveys of various categories of experts. For instance, the World Economic Forum has collected extensive data on companies' views as to whether the "antimonopoly law is effective" across various countries.[17] Surveys like these have the advantage of being able to provide data on a wide range of countries. Moreover, they also offer the potential of providing a holistic measure of the competition regime within a country (that is, the respondents to the survey can factor in both the law on the books and the way it is enforced into their answers). That said, surveys are not without their disadvantages. Most notably, they capture perceptions of various market actors that can be highly subjective and that may not be comparable across jurisdictions.

[16] *See* Bradford et al., *supra* note 14.

[17] *See, e.g.*, WORLD ECONOMIC FORUM, THE GLOBAL COMPETITIVENESS REPORT 2016-2017, https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1 (last visited Jan. 2, 2017).

2.2. Measuring Common Features of Competition Law

In addition to basing the CLI on coding statutes, we also elected to score countries based on whether they have common features of competition law rather than how closely the country's law resembles an "optimal law." This is because measuring the quality of countries' competition law would require us to engage in subjective assessment of what the appropriate law is, and also subscribe to an assumption that the optimal law remains constant over time and jurisdictions. Some external benchmarks for quality used by other researchers—such as OECD or ICN guidelines—would also be infeasible given the broad scope of our index across time and jurisdictions. There are no international benchmarks generated by these (or other) organizations that would allow us to measure the consistency of historical laws with internationally recognized best practices beyond the past two decades.[18]

Instead, we coded countries for whether their laws include various key provisions. While our data gathering has taught us the many varieties in which competition laws come, some standard features form the foundation of competition regimes almost universally. The CLI thus includes information on both the scope of the competition authority that the law conveys—including remedies that can be imposed if a violation is detected, the availability of the private right of action, or exemptions that shield certain sectors of the economy from competition scrutiny—as well as the substantive provisions of the law across the well-known categories of competition laws—merger control, abuse of dominance, and anticompetitive agreements. When deciding which specific features to code for in these categories, we build on the work by Hylton & Deng and Nicholson yet supplement their features with additional elements that we identify as important.[19] Here, we rely on our expertise as legal scholars—and one of our experience practicing competition law—to assess what the key elements of competition laws are.

Because of the decision to code for key provisions, the CLI is purely descriptive. We do not attach any normative judgment to the index. More law is not necessary better. Indeed, the way we construct the index reduces the overall score for many established regimes that recognize defenses (such as an efficiency defense) in their statutes. The index only measures the scope or

[18] However, our data contains many elements associated with the "quality" of competition law, such as the incorporation of "efficiency defense" as part of the law or acknowledgement of "consumer welfare" or "efficiency" as the goal of the law. Thus, our data lends itself to the construction of an alternative index that focuses on these more qualitative properties.

[19] *See* Hylton & Deng, *supra* note 2; Nicholson, *supra* note 2.

the expansiveness of competition laws and hence the magnitude of regulatory risk embedded in the legal framework. It provides no ranking or indication of the effectiveness or soundness of the regime and hence cannot be used to rank countries in terms of their capacity to promulgate optimal regulation or to act as benchmarks of "optimal" regulation that others should follow.

2.3. Limitations

Before discussing our data and the coding of the CLI, it is important to recognize that there are limitations to any index that attempts to quantify competition regulation. This is because it is difficult to produce a single metric that tells the comprehensive story of country's competition regime. For example, if a specific type of conduct is prohibited, is it prohibited always (per se) or sometimes (rule of reason)? This seems like a relevant distinction to code, but it turns out to be difficult to capture systematically in many jurisdictions. For instance, Article 101(3) of the Treaty on the Functioning of the European Union (TFEU) seems to regulate anticompetitive agreements under the rule of reason standard in the European Union, but, in practice, cartels are per se prohibited. This highlights the challenge of coding even just the law in books, let alone accounting for all the nuances of a country's competition policies.[20]

But a key principle that has guided our data gathering and coding is to not let the perfect be the enemy of the good. As a result, although we believe that the CLI provides several advancements beyond what was offered by other measures, we recognize that future data collection and coding efforts could provide an even more complete picture of competition policy around the world. We thus hope that others build on the work we have done and continue to produce more precise measures of the essence of these laws and the intensity with which they shape the regulatory environment for competition.

3. DATA

Our large-scale data collection effort began by identifying every jurisdiction that had adopted a domestic competition law by 2010.[21] Our research suggested that 126 countries had a

[20] Similar problems can exist when trying to code enforcement activities. For example, data on enforcement actions may not capture the type of evidence that the competition agency accepts, or what standard of proof the courts require. Moreover, even if you had complete data on these questions, it still may not tell the complete story if it does not capture the skill, effort levels, or ideologies of various enforcers involved.

[21] For more information on the competition law data we have gathered and our process, see Bradford et al., *supra* note 5.

competition law by then, including all 34 OECD countries. Additionally, seven regional organizations in some way regulate competition; including the EU, which exercises supranational competition jurisdiction over its 28 member states. For each jurisdiction, we identified the first year that a competition law was adopted and then tried to find every additional competition law passed thereafter until 2010. Thus, for example, for the United States, the first law we identified dates back to 1890, and for Germany, the first law we identified dates back to 1923.

We then coded the content of each of the laws we identified. To facilitate this coding, we developed a survey instrument that included questions on a large number of provisions found in competition laws. For example, the survey instrument had questions that capture the laws' stated policy goals; various substantive provisions on merger control, abuse of dominance, or anticompetitive agreements; and features such as the type of remedies authorized and exemptions embedded in these laws.

To identify and code these laws, we relied on the research assistance of over 70 students from Columbia Law School over a six-year period. This group included many international students who had relevant knowledge of foreign legal systems and required language skills. We had two students separately code each law using our survey instrument. A third coder then reviewed the original laws and resolved any discrepancies in instances where the original two coders differed on the initial coding round.[22] In the end, we managed to obtain and code 700 laws from 123 countries and 5 regional groups, leaving only 3 countries with competition laws by 2010 outside our dataset.[23]

4. CONSTRUCTION OF THE COMPETITION LAW INDEX

The Competition Law Index consists of two categories of variables: one category captures the provisions on the ***Authority*** to regulate competition while the other category captures the ***Substance*** of the law. By ***Authority***, we refer to provisions on who can enforce the laws and the limits of their application, including the availability of remedies or private litigation as tools of competition enforcement. By ***Substance***, we refer to the substantive rules regulating competition.

[22] Due to language constraints, it was not always possible to have the laws coded independently three times. For 5 countries, the laws were coded by one coder who was assisted by a project leader.

[23] As previously noted, for Djibouti, Faroe Islands, and Iran, we were unable to identify the laws or analyze them for linguistic reasons.

More specifically, ***Substance*** refers to three sub-categories of rules: merger control, abuse of dominance, and anticompetitive agreements.

Figure 1 graphically depicts the categories of variables that comprise the CLI. Table 1 lists all the variables used to construct the CLI by category and the weights assigned to each. For each variable, countries can receive positive or negative "points." For example, a country would receive 1 point in the calculation of the CLI if their antitrust regime has private right of action, but -0.5 points would be deducted if the countries' antitrust law included industry exemptions. To help illustrate these variables, Figure 2 presents the percent of countries in the world that had each policy in place in 2010.[24] As Figure 2 shows, there is considerable variation in the prevalence of each of the variables we use to construct the CLI. For instance, just 7 percent of countries in the world (13 total countries) have prohibitions on **Discounts**, but 60 percent of countries in the world (119 total countries) authorize countries to issue Fines for antitrust violations.

Below we explain the variables used to construct the CLI.[25] We start by describing the **Authority** category variables, followed by describing the variables that make up the **Substance** category. Afterwards, we explain how we aggregate all these data into the CLI.

4.1. Authority

Competition statutes typically define the scope of competition authority and, with that, the structure of the regime. These provisions include determining who can bring suits against firms alleged of anticompetitive behavior and what remedies can be imposed if a violation is found. These provisions also define the reach of competition law, including whether all industries and enterprise types fall within the scope of the law and whether behavior outside one's own territory can be targeted with a competition action.

Competition laws are typically enforced by governments, making these laws part of the administrative regulatory apparatus of the state. However, some jurisdictions also recognize the right of individuals to bring suits against companies that violate competition rules. This additional avenue for competition claims increases the risk that companies face when operating in the

[24] Figure 2 is inspired by a simillar figure used to introduce the DESTA dataset of preferential trade agreements. See Andreas Dur, Leonardo Baccini, and Manfred Elsig, *The Design of International Trade Agreements: Introducing a New Dataset*, 9 REV. OF INT'L ORG. 353 (2014).

[25] Appendix 2 provides descriptions of the variables used to construct the CLI.

marketplace. We therefore consider a competition regime that allows private parties to complement the government enforcement as more expansive than one where only the government is empowered to challenge anticompetitive behavior. Consequently, the presence of a **private right of action** in the competition regime increases the CLI by one point.

Remedies are an important element of competition regimes that significantly influence behavior of firms. If certain anticompetitive behavior is prohibited, yet no meaningful consequences are attached to violating the law, the risk associated with anticompetitive behavior is lower and, naturally, violations are more common as a result. The most common remedy embedded in competition laws is a monetary fine. Consequently, the ability to sanction the companies with **fines** increases the CLI by one point. Some jurisdictions have also criminalized anticompetitive behavior. While fines are substantially more commonly employed as a remedy around the world, many experts argue that the ability to imprison individuals can significantly increase deterrence and hence the effectiveness of a competition law. The existence of **imprisonment** as a remedy thus further increases the scope of the competition law and the risk embedded in anticompetitive behavior, further adding one point towards the CLI.

Neither fines nor imprisonment are typically employed in the context of merger control. Instead, the most common remedy is a divestiture or an injunction and hence an obligation to modify the structure of the proposed transaction or an outright prohibition of the merger. Some jurisdictions also employ behavioral remedies even though structural remedies remain more common. This structural remedy targets the anticompetitive concern directly and allows for a significant intervention into the deal structure by authorities. The presence of a **divestiture** remedy in the law hence increases the CLI by one point.[26] In some jurisdictions, private parties are also entitled to **damages**. In fact, most jurisdictions that allow for a private right of action recognize damages as a way to provide compensation for injured parties, leaving an injunction or other remedies for the government to pursue. Moreover, while damages are typically the result of a private right of action, they can also be coupled with a government suit in some jurisdictions. We hence treat damages to private parties as an independent remedy that can further strengthen

[26] Some jurisdictions recognize divestiture as a remedy in abuse of dominance contexts as well. We increase the CLI by one point if the law provides for a divestiture irrespective whether the divestiture is recognized in the context of merger control, abuse of dominance, or both.

a competition law by increasing the risk associated with anticompetitive behavior. A law recognizing the right to damages hence increases the CLI by one point.

In addition to the private right of action and remedies associated with violations, competition authority can be enhanced with the ability to pursue conduct that emanates from abroad. Many laws recognize **extraterritoriality** that allows the country to attach jurisdiction whenever their market is affected irrespective of the nationality of firms or the location of the allegedly anticompetitive conduct. The ability to engage in extraterritorial enforcement is significant as it brings within the scope of domestic competition law a wide range of foreign conduct that could otherwise remain unregulated. In our index, the recognition of extraterritoriality in the law enhances the CLI by one point.

In contrast, the CLI's authority score is reduced when legislators carve out certain industries or types of enterprises that fall outside the powers of the agency. These exemptions are common and allow certain conduct to escape competition review. Our index takes into account two types of exemptions: exemptions of a certain industry (such as agriculture or telecommunications) as well as certain types of enterprises (such as state-owned enterprises or export cartels). The presence of (any) **industry exemptions** reduces the CLI by half a point. Similarly, the presence of (any) **enterprise exemptions** lowers the CLI by half a point.[27] Throughout the construction of the Index, we consider any exemptions or defenses that reduce the intensity of the competition regulation to be worth 0.5 as opposed to a full point. This is because the law remains applicable to a range of industries and companies (in case of exemptions) and to a range of transactions and behavior (in case of defenses) where the defense outlined in the law is not applicable.

To summarize, our Authority score can range from -1 to 6, depending on the presence or absence of provisions on a private right of action (1), fines (1), imprisonment (1), divestitures (1), damages (1), extraterritoriality (1), industry exemptions (-0.5) and categorical enterprise

[27] An alternative way to construct the index would be to lower the index gradually more with each exemption. However, as we have no way of determining the economic significance of any given exemption in a systematic way, it seemed questionable to let the exemptions shift the index too dramatically, especially as the law typically remains applicable to a wide segment of the economy. Also, one could argue that agency resources can be targeted to enforce laws *vis-à-vis* included sectors all the more vigorously if some sectors or groups of enterprises are carved out of the law. However, in Part 6.2 we discuss a more nuanced way to incorporate the data on exemptions.

exemptions (-0.5). As we will explain below in Section 4.3., these values will be doubled in their weight when we construct the overall index, reflecting our view that these are essential features of the competition regime.

4.2. Substance

Most competition laws regulate three broad categories of activity: merger control, abuse of dominance, and anticompetitive agreements. The Substance category of the CLI is built around these three familiar sub-categories of rules.

Merger Control. To exercise merger control, many jurisdictions rely on a mandatory or voluntary notification system. In most cases, a notified merger is reviewed by the authority, which has to approve the merger before parties are entitled to close the transaction (**pre-merger notification**). In some jurisdictions, merger can be notified after the closing (post-merger notification). Regulatory risk is greater for firms if they have to seek approval as a condition for closing the merger. We also consider the law more invasive if the **notification obligation is mandatory** as it always imposes costs and delays on deals, whether they raise competition concerns or not. Thus, for the purposes of calculating the CLI, mandatory merger control increases the index by one point, as does the obligation to notify pre- as opposed to post-merger. Thus, a system with a mandatory pre-notification adds two points towards the overall CLI whereas, for instance, a mandatory post-merger notification or voluntary pre-merger notification adds just one point.[28]

In addition to merger notification, we add points to the CLI depending on how expansive powers the law grants with respect to the substantive merger review. Jurisdictions that restrict mergers on grounds that they lessen competition or create or strengthen dominance ("**economic reasons**") have their CLI increased by one point. Jurisdictions that additionally restrict mergers on grounds of some **public interest** similarly see their CLI increase by one point. Thus, a jurisdiction that gives the agency vast powers to restrict by mergers, whether on economic or public interest grounds, see a two-point increase in CLI. This reflects the broader risk that parties face when multiple grounds exist for prohibiting or restructuring the merger.

[28] According to this method, voluntary post-merger notification yields no points towards the CLI given the weakness of such a notification regime. However, our data shows such regimes to be rare. In fact, only 2 countries had this in 2010.

Merger control consists of a prediction of the future effects of the combined entity's behavior in the market place. Often the key question is whether possible anticompetitive effects outweigh efficiencies that the merger creates. One explicit way to acknowledge this is to include an **efficiency defense** into the competition statute. The presence of this defense reduces the competition risk as the merging parties can escape prohibition or divestiture or other remedy by showing the efficiencies that the merger generates. Consequently, this defense also lowers the CLI as the scope of prohibition is lower in the presence of the defense. Two other types of defenses are common in the merger area: the **failing firm defense** that allows a firm on the verge of bankruptcy to be acquired else the assets would disappear from the market altogether. Finally, some jurisdictions are willing to entertain a broader set of reasons that contribute towards public interest (**public interest defense**) as grounds for approving an otherwise anticompetitive merger. The presence of any of these defenses reduces the CLI by 0.5 point each, leading to a maximum of -1.5 decrease in the country's CLI.

Abuse of Dominance. Some jurisdictions simply prohibit abusive conduct by a dominant company without giving detailed guidance at the statutory level as to what kind of behavior constitutes an abuse. This kind of a general or "blanket" prohibition can give the agency vast discretion to determine what constitutes an abuse. In many ways, such a prohibition maximizes competition risk as it is unclear what type of conduct falls afoul of competition law. However, such a provision giving agencies open-ended discretion is rare. Typically, competition laws enumerate various types of conduct that count as anticompetitive abuses of a dominant position. To avoid the situation where the CLI is too sensitive to this choice between a blanket prohibition versus enumeration in any given jurisdiction, we assign 2 points for a **general prohibition of abuse of dominance** yet increase the overall dominance score by small increments with each enumerated abuse.

Specifically, our CLI separately accounts for the most common types of behaviors that are generally considered as abusive when engaged in by a dominant company. These include price and non-price related conduct, including **discriminatory pricing, resale price maintenance, unfair (or excessive) pricing, predatory pricing and anticompetitive discounts** (price-related abuses), as well as **tying** and **refusal to deal** (non-price related abuses). These are generally recognized as the most well-known categories of abusive practices in competition laws and in

competition law scholarship. However, to allow for a conduct that was not foreseen by us to contribute towards the CLI, we include an **"other abuses"** category that captures any other type of conduct recognized by country's law. The acknowledgment of any of these individual types of abuses increases the CLI by 0.25 each, amounting to additional 2 points in total. This brings the maximum intensity of abuse of dominant position to 4 points in total, reflecting the general prohibition plus the enumerated abuses. As with mergers, some competition statutes recognize the efficiencies that otherwise anticompetitive conduct by a dominant company entails. If the law recognizes such an **efficiency defense**, the CLI is adjusted to reflect this reduced competition risk by a reduction of half a point. Similar reduction follows a presence of a **public interest defense**.

Anticompetitive Agreements. The final category of substantive prohibitions is anticompetitive agreements.[29] We separately coded provisions on horizontal and vertical agreements. Our dataset confirms the intuition shared by many that cartels are the most commonly prohibited anticompetitive activity, both today and in the past. Our dataset recognizes four most common cartel practices: **price fixing, market sharing, output limitations** and **bid rigging**. The inclusion of any of these common cartel types in country's law increase the CLI by 0.5 points each, contributing the maximum of 2 points to the CLI. Notably, these are the only types of horizontal agreements that feature in our CLI. We recognize that some competition statutes also regulate other types of horizontal agreements, which may reduce competition yet fall short of being cartels. However, the status of such agreements is highly varied across the world, making it difficult to code them systematically across countries and over time.

We similarly assign the maximum of 2 points towards the CLI if the country's law prohibits the following categories of vertical agreements: **exclusive dealing, resale price maintenance, tying** as well as agreements that in some other ways **eliminate competitors.** Restrictions on exclusive dealing and resale price maintenance are common vertical provisions in competition laws. Their meaning is also generally well understood. Another common provision deals with tying, which many laws consider anticompetitive even in the absence of dominance. Our fourth type of vertical agreement category comprises agreements that aim at eliminating competitors.

[29] This is similar but not identical to the "restrictive trade practices" category created by Hylton & Deng and Nicholson.

This is a somewhat more open-ended provision, which is designed to capture prohibitions of coercive or other practices that eliminate competitors or make it difficult for them to increase their market share.[30] Each of these four categories increases the CLI by 0.5 points, contributing the total of 2 points towards the CLI. Thus, the maximum score for anticompetitive agreements—whether cartels or vertical agreements—will be 4.

As with mergers and dominance provisions, some competition statutes regulating anticompetitive agreements also recognize the efficiencies that some of the potentially anticompetitive conduct entails. These are significantly more common in case of vertical agreements than in case of cartels. If the law recognizes such an **efficiency defense**, the CLI will be reduced by half a point to reflect this reduced competition risk. The availability of a **public interest defense** similarly reduces the CLI by half a point.

Substance Summary. Our Substantive Provisions CLI score can range from -3.5 to 12, depending on whether the law contains provisions on merger control (max. 4), abuse of a dominant position (max. 4), and anticompetitive agreements (max. 4) and whether some reductions to CLI are made because of the presence of various defenses in the law (max. -3.5).

4.3. Overall CLI

As Figure 1 and Table 1 illustrate, our general approach is to treat the various key prohibitions as equal unless we have a strong reason to weigh various elements differently. For example, the rules on merger control, abuse of dominance, or anticompetitive agreements contribute equal weights to the index even though some provisions are arguably more important. Similarly, our default was to not weigh various substantive provisions within each of these three primary categories differently. We are all the more cautious to avoid imposing any such hierarchy on our index given the broad scope of our data across the time and jurisdictions. This is because we are skeptical that any hierarchy could equally make sense for the United States competition

[30] Our coding of this element captures clauses like the Art. 6(1)(6) of the Polish 2007 Consumer and competition Act, which prohibits agreements that "[limit] access to the market or [eliminate] from the market undertakings which are not parties to the agreement."

regime in 1900, the German competition regime in 1950, or the Kenyan competition regime in 2010.

The major exception to this general "equal weighing" approach is that, when combining the Authority and Substance categories into a single index, we weighted the components so that the CLI is based on 50% from the features comprising the competition authority and 50% of the CLI from the features comprising the substantive provisions. Thus, while the competition authority with all its components yields up to 6 points in total, we double their weight and count that sub-index as equivalent to 12 points. This makes competition authority provisions equally as important as substantive provisions. Built this way, substantive provisions on merger control, abuse of dominance, and anticompetitive agreements each contribute 1/6 to the overall index.

The reason we weighted the authority provisions equally with the substantive provisions is that that the authority provisions typically apply to multiple areas of substantive competition regulation and hence increase the overall competition risk in a significant way. We believe this choice is further justified because laws without the possibility of sanctions are unlikely to change behavior.[31] The CLI hence reflects the view that the elements of competition law that elevate the likelihood of violations being found and consequences being attached—like the availability of remedies or private enforcement—are critical components of the regulation of anticompetitive behavior.[32]

One other important note about how we construct the CLI is that, after calculating the overall scores from 0-24, we then normalize them to range from 0 to 1. A score of 0 is thus the score that countries receive if they do not have any competition statute in a given year, and a score of 1 is the score of the country that had the most stringent legal regime in place (*i.e.,* received the most points from Table 1).

---

[31] *See, e.g.*, Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968); JACK GOLDSMITH & ERIC POSNER, THE LIMITS OF INTERNATIONAL LAW (2005). *But see* RICHARD MCADAMS, THE EXPRESSIVE POWERS OF LAW (2015).

[32] As explained in Part 7 below, Buccirossi et al. follow Becker more directly in their attempt to measure deterrence and include information on actual levels of sanctions or likelihood of detection. *See* Paolo Buccirossi, Lorenzo Ciari, Tomaso Duso, Giancarlo Spagnolo, & Cristiana Vitale, *Measuring the Deterrence Properties of Competition Policy: The Competition Policy Indexes*, 7 J. COMPETITION L. & ECON. 165, 167 (2011).

5. RESULTS

We provide a complete list of CLI scores in 2010 in Appendix 1,[33] but here we illustrate a number of key trends across countries and over time. First, we show the overall distribution of CLI scores in 2010, and illustrate how that distribution spans across specific countries. We then examine the evolution of the CLI over time. Finally, we take a closer look at trends in CLI scores over time in a few key jurisdictions.

5.1. Results in 2010

Figure 3 shows the distribution of CLI scores for countries with a competition law in 2010. Since the CLI is normalized to fall between 0 and 1, countries without a competition law are set to have a score of 0. In 2010, the minimum CLI score for a country with a competition law is 0.14 (Benin) while the maximum is 0.95 (a score shared by Japan and Saudi Arabia). For countries with a competition law, the mean CLI score is 0.65 and the median CLI score is 0.67, which is roughly the CLI score of Italy.

Figure 4 illustrates the CLI scores for specific countries in 2010. The darkest color marks the countries that had the highest CLI score in 2010, ranging from 0.8-1. These countries include Canada and China. The second darkest color captures the countries whose CLI score ranges from 0.6 to 0.8 (including the United States and the United Kingdom), followed by lighter shade of gray denoting the countries with a score ranging from 0.4 to 0.6 (including Norway and Singapore), with the next categories with each even lighter shade of gray marking the countries with 0.2-0.4 (including Egypt and Bolivia), and 0-0.2 (the only country that scored in this range in 2010 is Benin), scores, respectively. The countries that are shown as white had no competition law and hence a score of zero in 2010. As Figure 4 shows, it is not just the established antitrust regimes in North America and Europe that have high CLI scores—there are countries in every region of the world with detailed competition laws.

5.2 Trends Over Time

Figure 5 explores the evolution of the CLI scores over time. More specifically, Figure 5 depicts the mean CLI score for countries that had a competition law in place in any given year,

[33] As previously noted, the complete dataset is available for download at our project website: www.comparativecompetitionlaw.org.

starting in 1890 and ending in 2010. It shows that the mean score has gradually increased over time, starting from 0.27 in 1890 and growing to 0.65 by 2010. The largest increase took place after 1990, which coincides with a dramatic increase in the number of countries with competition laws. In 1990, there were 51 countries with competition law (which had a mean CLI score of 0.50), but by 2010 there were 126 countries with competition law (which, as previously mentioned, had a mean CLI score of 0.65).

Figure 5 also shows that mean CLI scores—which can be understood as a measure of more stringent competition law regimes—have continually increased over time. This is the case even though various defenses (which lead to a reduction in the CLI) became more common over time as well. For example, only one country had an efficiency defense for abuse of dominance in 1950, but by 2010, 45 countries had the same defense. But despite the increase in defenses, the overall trend has still been systematically towards greater "net stringency" over time. Although it may seem obvious that regulation would have increased over time, there are reasons to think that other trends may have occurred instead. For instance, other areas of business law, such as financial regulation, have followed more of a "sine curve" over the years as the pendulum has shifted from lax to stringent and back again to lax regulation.[34] Competition law, once introduced, seems stickier. On average, countries add to its scope over time rather than repeal provisions or scale back its stringency.

5.3 Trends for Key Players

Figure 6 shows the evolution of CLI scores for six established competition law jurisdictions: Canada, the United States, the European Union, Germany, the United Kingdom, and Japan. Again, the trend towards greater stringency of competition laws over time stands out in these graphs. For Canada, the increase in competition law stringency is rather steady, with the biggest change taking place in 1975 with the adoption of private right of actions and remedies. In the United States, the index responds in particular to the following shifts in regulation: the adoption of Clayton Act that introduced merger control in 1914[35] and the passing of the Hart-

[34] John C. Coffee Jr., *Political Economy of Dodd-Frank: Why Financial Reform Tends to be Frustrated and Systemic Risk Perpetuated*, 97 CORNELL L. REV. 1019 (2012).

[35] See The Clayton Antitrust Act of 1914 (Pub.L. 63–212, 38 Stat. 730, enacted October 15, 1914, codified at 15 U.S.C. §§ 12–27, 29 U.S.C. §§ 52–53).

Scott-Rodino Act in 1976 that established pre-merger notification.[36] In the EU, competition law was introduced only in 1957 and, again here, the biggest shift in the CLI occurs when merger control regulation enters into force in 1990.[37] Overall, the EU's Index may seem surprisingly low compared to other jurisdictions given the EU's reputation as the most stringent competition regime in the world. This is largely due to the absence of features like criminal enforcement, damages and private right of action in the EU.[38] Of course, the EU's CLI score does not present the full picture of competition law in Europe, because, as we discuss more in Part 6.3, Member States of the EU also have their own competition regimes. Understanding the regulatory risk of doing business in Europe may thus require accounting for the competition policies of the EU and individual members. Turning to one such member, Germany, we do not observe notable shifts but rather a very steady increase in the stringency of the regime. The United Kingdom manifests a dip in the law's stringency in the 1970s before the passage of its Competition Act in 1980. Finally, Japan stands out with a notably and steadily high index throughout the entire period of its law's existence. This is in part to do with Japan having features like a private right of action but not having defenses that would reduce the country's score.

Next, we examine the trends in emerging competition jurisdictions that might reflect different patterns either because their economic fundamentals or broader societal and political structures differ from those that exit in more established competition jurisdictions. Figure 7 displays CLI scores for the BRIC countries: Brazil, Russia, India, and China. China and Russia adopted competition laws relatively recently, which might also affect their laws' stringency. Interestingly, the four BRIC countries exhibit very different patterns. China in particular represents a striking departure from countries whose index shifts gradually. China has some competition provisions as of 1993, but introduces its general competition law in 2008. At the outset, China adopts one of the most stringent competition laws in the world with a CLI score of 0.94 in 2008. The score reflects the broad scope of the law that includes features like authority for extraterritorial application but limited defenses. Brazil's law is the second most stringent of the BRIC countries, gaining in stringency in particular in 1991 when merger review was added to the

[36] *See* The Hart Scott Rodino Antitrust Improvements Act of 1976.

[37] *See* EEC Council Regulation No 4064 on the control of concentrations between undertakings.

[38] In addition, the perception of EU competition laws as stringent may be attributed to how often the EU deploys prohibitions it has in place and actually enforces the law rather than any unusual stringency of its laws as such.

country's antitrust authority. India has the steadiest law, with minor adjustment taking place in 2009 when merger review is added to the law. Otherwise the stringency of the law remains unchanged. Russia's competition law was adopted in 1990 following the collapse of the Soviet Union. The CLI score starts as relatively high 0.68, with a minor shift downwards in stringency with an amendment to its law in 1995 when private right of actions were removed, followed by a near imminent adjustment upwards in 1996 as Russia adopts imprisonment as a remedy. Taken together, Figure 7 illustrates how competition law is a feature of major developing economies, but that their regimes have not all followed the same pattern.

6. ALTERATIVE VERSIONS OF THE CLI

This Section offers four alternative ways that we can employ our data to quantify competition laws across countries and over time. First, we disaggregate our CLI into its sub-components, illustrating the way we can measure the stringency of competition law by focusing on a specific dimension of competition law, only. Second, we leverage the detailed information we coded on various exemptions from antitrust laws as well as sectoral laws, offering a more nuanced way to capture the stringency of competition laws in instances where provisions apply to a part of the economy, only. Third, we discuss how we can combine our data with coding on regional organizations' competition laws to create an aggregate picture of a country's competition law. Finally, we conduct a principal component analysis that employs statistical techniques to derive the weighting schemes for the CLI.

6.1. Sub-Indexes

Some research projects may focus on specific aspect of competition law as opposed to the regime as a whole. For example, if one seeks to explain the adoption and evolution of merger control laws, the CLI would be too general. Instead, an index of the merger control provisions of a country's competition law might provide a more precise dependent variable to answer this question.

The CLI has the advantage that it can be disaggregated into its components. For example, it can be used to separately measure the strength of a country's competition regime structure by only focusing on the variables comprising the "Authority" score. Moreover, the "Substantive Provisions" of CLI can be further separated into various sub-indexes to create a stringency score

for merger control, abuse of dominance provisions, or anticompetitive agreements. To illustrate this point, Figure 8 shows the trends over time across these sub-indexes and compares those trends to the overall CLI.

6.2. Accounting for Exemptions and Narrow Applications

One particularly nuanced feature of our dataset on competition law is that we coded separately *for any given coded provision of the competition law* whether the provision exempts certain industries or categories of enterprises for all or part of the country's competition law. By way of an example, if our data reveals that tying by a dominant company was prohibited under German competition law in 1986, our data also records if certain industries or enterprise types are exempted from that particular provision.

To illustrate these data, Figure 9 maps countries by the number of provisions in their competition law in 2010 that had each of four kinds of exemptions or narrow applications: Compete Category Exemptions, Partial Category Exemptions, Narrow Industry Coverage, or General Industry Exemptions. The difference between complete and partial category exemption is that the former exempts certain enterprise types—say, state monopolies—altogether from competition law whereas the latter exempts them only partially, such as only when they perform certain public functions. Narrow industry coverage refers to sectoral regulations where some industry is brought within the scope of competition law even when the rest of the economy would remain unregulated. General industry exemption does the opposite by carving out certain industries from the scope of the law while leaving the law applicable to others. As the map shows, although the majority of countries do not have any of these exemptions for any of the provisions of their antitrust regimes, other countries—like Mexico or South America—frequently have these exceptions.

This additional layer of detailed coding makes it possible to adjust the index to create an alternative version of the CLI that takes these exemptions into account (the "Exemption Adjusted CLI"). Thus, while the Authority component of the CLI includes deductions for industry and enterprise exemptions in general, in constructing the Exemption Adjust CLI, we no longer make any blanket reductions from the authority score as we did before.[39] Instead, we adjust *each provision*

[39] With respect to narrow applications, our primary CLI only assigns a point for each provision that applies to the entire economy. For example, if the German 1986 law on telecommunications sector promulgates that tying by a dominant

that contributes towards the CLI by using the following multiplier: Narrow application awards the country 0.1 times (10%) the original score, complete category or Industry exemptions 0.8 times (80%) the score, and partial exemption 0.9 times (90%) the original score that the country would otherwise obtain. Figure 10 presents the Exemption Adjusted CLI that is calculated after first re-coding the variables used in the CLI to account for these nuances.

To illustrate this, imagine a hypothetical provision from the 1986 competition law in Germany that prohibited tying for dominant countries. If the tying was only prohibited in telecommunications industry ("narrow application"), before calculating the CLI, we would adjust the German variable for tying from being coded as 1 to 0.1. Since tying receives 0.25 points in the CLI index, the new score of 0.1 would be multiplied by 0.25. Alternatively, if State Owned Enterprises were completely exempted from the tying provision, before calculating the CLI, we would adjust the coding of the tying variable from 1 to 0.8. In this scenario, the tying would only contribute 0.8 x 0.25 towards the CLE (as opposed to full 0.25 points). This adjustment methodology yields a very detailed index, which is more sensitive to the extent to which any exemption or narrow application actually affects a country's competition regime.

However, we hesitate to use this adjusted CLI as our preferred index for two reasons. First, our primary CLI is—simply put—much simpler. Our index already captures multiple elements, making us hesitant to introduce further nuance. Second, and more importantly, this adjusted index is highly sensitive to the multiplier we assign to the narrow application or the exemption. We cannot be sure that a provision applying to the telecommunications industry, only, should account as 0.1 and hence 10% of the weigh compared to that same provision that covers the entire economy. It may be that 0.05 or 0.20 would be a more defensible adjustment. Our dataset records the multiplier separately, making it easy for any researcher to re-create the index and check its robustness using any number of alternative multipliers that might be considered more appropriate. However, even then, it is doubtful that any adjustment would be "globally" correct. In other words, in some jurisdiction the sector specific regulation likely constitutes a miniscule part of the economy, whereas in others the role of the industry in question might be central. The importance of SOEs or state monopolies may also not only vary across countries but likely also changes from

company is prohibited in this industry, we would not code tying as "1" absent any provision extending this prohibition to the broader economy.

year to year even within a single country. To do justice to the varying economic significance of sectors or entities opted in (narrow application) or opted out (exemptions), we would need to account for the size of the industry or the enterprise type in the country's overall economy—something that is beyond the scope of our project given the broad scope of our dataset over time and jurisdictions.

6.3. Accounting for Regional Antitrust Regimes

One additional nuance of competition law is that there are both domestic laws and regional laws regulating competition.[40] For instance, one challenge when constructing the CLI for EU member state countries is that they have the authority to apply both national law and EU law. But for simplicity, the CLI treats the EU member states as independent nation-states whose competition law score reflects exclusively their national law. Although this approach is simpler, the tradeoff is that it ignores the additional competition law authority that countries like France or Germany derive from the EU law.

To account for this fact, we separately coded the EU competition laws. We then are able to construct a version of the CLI that adjusts each country's laws to account for the coding of provisions from the EU law. More specifically, we code the EU law and the national law separately so that we can construct a combined value for each EU member state following the guidance the EU Treaty sets in this regard. For instance, when constructing an index for Germany, we apply the German national coding (as opposed to EU level coding) for "remedies" variables where the EU treaty allows for individual states to legislate. Yet for the variables where the EU law takes precedence over German law, we allow the EU law coding to prevail over German law coding. In many instances, Germany has the option of pursuing enforcement under German law or EU law. In those cases, we count any given provision to exist in Germany as long as it can be derived from either the German national competition law index or the EU competition law index for that year.[41]

---

[40] We are aware of at least seven regional organizations that have some form of competition policy: Andean Community, the Caribbean Community (CARICOM), the Common Market for Eastern and Southern Africa (COMESA), the European Economic Area (EEA), the European Union, the Economic Community of West Africa States (ECOWAS), and the West African Economic and Monetary Union (WAEMU). But to our knowledge, only the competition laws of the EU and EEA operate in the same spheres of member states domestic laws, which is why these are the only two regional organizations for which we adjusted the CLI.

[41] We repeat the same exercise for the EEA countries that feature a similar relationship between EEA-law and member state law. This affects the coding of Iceland, Liechtenstein, and Norway, which are members of the European Economic Area. Our research suggests that the other regional regimes we coded operate in different spheres than national

As a result, given that we coded the EU law and the member state national law separately from the outset, we preserved the option of creating a national-only CLI for each EU member state or an adjusted CLI that layers on EU law onto each member state's law. The default CLI is most relevant if one seeks to measure the competition risk that purely locally operating companies face or if one tries to more accurately capture the regulatory preferences of national legislators. However, regionally adjusted CLI offers a more comprehensive measure of law's stringency, revealing the law's strength that stems from both national and regional law.

6.4. Principal Component Analysis

We have now presented several versions of an index that can be used to measure competition law around the world using the data we have collected on competition law. Although we believe that the choices we have made when constructing these indexes are reasonable, they all still are based on subjective choices. For instance, for the main CLI, we decided to weigh Authority variables equally with Substance variables. A valid concern may thus be that any results generated using these data are overly dependent on the decisions we made when creating the indexes and not the underlying data.

To assuage this concern, we follow Buccirossi et al. and also generated a measure of competition laws using our data that does not rely on subjective choices.[42] More specifically, we conducted a principal component analysis ("PCA") of the 36 variables included in the CLI. The advantage of using PCA is that it relies on statistical properties to analyze the variance among different variables, and then can be used to generate a predicted score for each country-year observation based on the values the country has for those variables. The score produced based by this process thus weights variables based on the amount of variance they explain, not the amount of weight placed on them by researchers. Table 2 reports the correlations between the CLI, the alternative indexes we discussed in Part 6.1 and 6.2, and the results generated via PCA. When using this approach, the correlation between the CLI and PCA is high—0.88 to be exact.

---

competition laws, which does not warrant combining the coding of regional and national level laws when constructing the CLI for those jurisdictions.

[42] *See* Buccirossi, *supra* note 32. We specifically conduct a PCA of the 36 variables included in the PCA, and then use the score produced by the first component as our PCA score. This departs from Buccirossi et al., who create an aggregate score by weighting all components with an eigenvalue of greater than 1 based on the proportion of the overall variance that they explain and then summing them up. When using this approach, instead of simply using the first component, the correlation between the PCA measure and the CLI increases to 0.91.

7. COMPARISON TO OTHER INDEXES

As previously noted, the CLI is not the first attempt to measure competition law regimes. We are aware of the following six indexes, which seem relevant for comparison: (1) *Antitrust Law Index* (ALI) by Nicholson; (2) *Scope Index* by Hylton & Deng*;* (3) *Competition Policy Indexes* (CPI) by Buccirossi et al.; (4) *Four Indicators* by Borrell and Jimenez; (5) *Four New Indicators* (FNI) by Stephan Voigt; and (6) *Indicators for Competition Law and Policy* (CLP) from the OECD. These indexes are summarized in Table 3 and we discuss each below in turn.

7.1. Comparisons

1. Antitrust Law Index (ALI) by Nicholson. The ALI was the first attempt to quantify competition laws across jurisdictions by providing a measure of competition statutes for 52 countries. The index is limited to a single year (2003). Given the similarity between the Nicholson ALI and the Scope Index, we only discuss the Scope Index more extensively below. That said, ALI remains an important pioneer in the field.

2. The Scope Index by Hylton & Deng. The Scope Index expanded on Nicholson's work, covering 102 countries for the years 2001-2004. Like ALI, the Scope Index quantifies the scope of the law by summing up the various prohibitions and deducting the various defenses that are embedded in statutes. The basic categories in the Scope Index comprise (1) territorial scope, (2) remedies, (3) private enforcement, (4) mergers, (5) dominance, and (6) restrictive trade practices. The only difference between Nicholson ALI and Hylton & Deng Scope Index is the inclusion of a public interest category in merger assessment by the Scope Index (both as a defense and as grounds for prohibition). Otherwise, the individual components of the indexes are identical.

The Scope Index is the closest to the CLI in that it also measures the law in the books, treating prohibitions as elements that increase the scope (or stringency) of the law and defenses as elements that reduce the scope (or stringency) of the law. Basic categories in the Scope Index and our CLI are also the same, even if somewhat differently labeled. For example, we refer to "anticompetitive agreements" where the Scope Index refers to "restrictive trade practices."

But there are elements that are different. First, the CLI includes some elements that are absent in the Scope Index. For instance, we take into account the industry exemptions and enterprise exemptions, which our data suggests that 84 countries had either or both of in 2010.

We also incorporate the following variables, which are not part of the Scope Index: (1) failing firm defense in merger control, (2) predatory pricing, loyalty discounts, tying, "other abuses," and public interest defense in the case of dominance, and (3) exclusive dealing, resale price maintenance, and public interest defense in case of anticompetitive agreements.

Second, the Scope Index includes the following elements, which we coded (to allow for replication) but decided not to include in our CLI: "Prevent entry" or "supply refusal" as part of anticompetitive agreements,[43] which we capture through eliminating competitors (we considered these categories as partially overlapping and removed the other categories to avoid double-counting), "obstacles to entry" as an abuse related to dominance (which we capture through more specific abuses that contribute towards hindering entry and, failing that, through our "other abuse" category). Regarding private enforcement, the Scope Index conflates private right of action with right of the private party to initiate an investigation by agency. We code for these separately and only include in the CLI the actual right of a private party to pursue a claim independently. Conceptually, we also treat damages as part of remedies as opposed to part of private enforcement to allow for the inclusion of damages that agency or courts can order in benefit of injured parties even as part of a government claim.

Third, the way the elements included in the Scope Index and CLI are aggregated differs. Our method for calculating the CLI is similar in that we add up the total prohibitions and obligations and deduct the defenses. The Scope Index has a scale of 0-29 whereas our scale is 0-24 (which we then normalize to fall between 0 and 1). However, our distribution ends up somewhat tighter as we include more defenses, including public interest defense across all areas of competition and the various industry and enterprise exemptions. The Scope Index also counts more substantive provisions (including, we would argue, double counts several provisions) and gives relatively greater weight to merger control.[44] Further, and most importantly, the Scope Index

[43] We do, however, include supply refusal under the abuse of dominance provisions.

[44] The Scope Index uses binary coding 0-1 except for merger notification, where there is a ranking: mandatory notification (3 points), voluntary notification (1 point), pre-merger notification (2 points), and post-merger notification (1 point). Thus, the presence of mandatory pre-merger regime would yield 5 points, whereas a mandatory post-merger regime 4 points. Similarly, voluntary pre-merger regime yields 3 points and voluntary post-merger regime 2 points. Yet *each category was reduced by 1 point when constructing the overall index* (thus e.g., mandatory premerger would be 4 and not 5). That said, this is higher than our CLI, where the maximum would be 2 points.

does not double the weight we give to remedies and other elements of competition authority and hence reflects more the substantive law in place rather than the regime structure more broadly.

The biggest difference, however, is that our CLI includes a greater number of laws—including systematically coding the laws other than general competition statutes—and adjusts the coding to reflect amendments that we detected as missing in the coding of the Scope Index. The CLI further takes advantage of our coding of sectoral regulations and our ability to distinguish if some provisions apply narrowly only to some industry or across the economy. Importantly, we always coded the entire "competition regime" in force any given year, which means that we layered together all the old and new laws that were in force in any given year. This entailed a careful review as to whether a new law replaces an old law entirely, amends it partially, or whether the old law remains fully in force while the new law simply adds to the previous statutes.[45] Finally, we only focus on statutes whereas the Scope Index purports to cover some case law, although it remains unclear if this was done in any systematic way. To avoid the risk of bias in the data, we excluded case law.[46]

3. Competition Policy Indexes (CPI). The CPI seeks to measure the quality and intensity of competition policy across a sample of 13 OECD countries over the period of 1995 to 2005.[47] The authors rely on Gary Becker's theory of deterrence and seek to measure properties of competition regimes that maximize deterrence and hence the effectiveness of competition laws.[48] They construct the CPI by comparing key features of competition policy regimes to generally agreed-upon best practices, such as OECD and ICN guidelines or the authors' judgment. In doing so, they single out the following variables: (1) the agency independence from political and economic interests, (2) the separation between adjudicator and prosecutor, (3) the quality of law in the books, (4) the scope of competition agency's investigative powers, (5) the level of expected

[45] When constructing the Scope Index, Hylton and Deng coded, for example, two surveys if there was a change in the country so that the country has two different scores. However, it is unclear whether there was any systematic effort to examine the relationship and layer the new and old laws to reflect the totality of laws in force in any given year.

[46] As previously noted, we did code the case law for the United States, which can be incorporated into an adjusted version of the CLI when it would be desirable to do so.

[47] *See* Buccirossi, *supra* note 32, at 167.

[48] More specifically, they focus on elements of competition regimes that measure the level of sanctions, the probability of detection and conviction, as well as the probability of errors.

sanctions, and (6) the activity level of competition agency as well as the quantity and quality of their resources. With these components, the authors construct a separate index for competition, mergers, institutional features and enforcement, as well as a single index that incorporates these four sub-indexes.[49]

Their component on the "quality of law in the books" would seem to resemble most our efforts to capture the substance of the laws. However, the CPI purports to measure how "good" the law is. Here, the CPI seeks to capture whether the country applies the "correct" standard of proof (rule or reason or per se) across four types of specific infringements (predatory pricing, refusal to deal, exclusive agreements and hard-core cartels) and if their assessment of the infringement is focused on economic (positive sign of quality) or non-economic goals (negative sign of quality).[50] For merger control, the quality of law is considered higher if it entails a notification obligation and if that notification obligation is based on company's turnover (revenue). Finally, the CPI's element measuring "level of sanctions" also bears some resemblance with the CLI as it includes elements that can be derived from statutes, including the range of sanctions that offending firms may face (including fines, imprisonment and damages) and whether affected parties can sue for damages.

4. Four Indicators. Borrell and Jimenez construct four indexes to measure "objective characteristics of competition policy design and enforcement."[51] They code 13 features across 47 economies, using the competition regimes in 2004 as their baseline for evaluation. Their features are grouped on four categories and capture (1) agency independence, (2) cartels, (3) dominance and (4) mergers. Their indexes resemble the efforts captured by CPI. For example, their index for cartels ask if cartels are per se illegal, if published guidelines for cartels exist, if criminal sanctions or punitive sanctions are available, and if the country has a leniency policy in place. All these features seek to measure the degree of "seriousness" of cartel policy and their presence contribute

[49] The methodology behind the CPI construction follows that used to build OECD indicators for competition law and policy (CPL). The CPL Index, calculated across all OECD countries for a single year (2003), measures policies implemented by competition agencies and sectoral regulators that seek to enhance the level of competition. The methodology is also close to the one used in building OECD's product market regulations (PMR) index, which measures restrictions to competition due to inefficient regulations.

[50] In addition, the presence of a leniency program is included as it typically increased the probability of detection.

[51] Joan-Ramon Borrell & Juan Jiménez, *The Drivers of Antitrust Effectiveness*, 185 HACIENDA PÚBLICA ESPAÑOLA 69 (2008).

positively towards the index. The indexes for dominance and mergers measure the compatibility of those areas with economic theory—focusing on whether dominance abuses are per se illegal, whether dominance is defined by market share, and what that threshold is for dominance. For instance, the per se prohibition enters negatively into the index. The indexes for mergers similarly asks if guidelines exist, whether government or the agency has the last say on mergers, and whether merger control is geared at protecting competition or public interest.

Like the CPI, the Four Indicators also seek to measure the quality of the laws, making the measure difficult to compare to our CLI. Instead of relying on surveys like the Four New Indicators that we discuss below does, or on the best practice guidelines published by international organizations like the CPI does, Borrell and Jimenez base their evaluation on their subjective assessment on the consistency of the law with economic theory, relying heavily on the choice the law makes between using a per se or rule of reason standard or on whether the law is transparent. The similarity with the CLI is limited to few features the Four Indicators capture, predominantly whether the law provides for criminal sanctions.

***5. Four New Indicators* (FNI).** Stephan Voigt's FNI measures (1) substantive content of competition law, (2) the degree to which the law incorporates economic approach, (3) de jure agency independence and (4) de facto agency independence.[52] The "substantive law indicator" reflects a higher value if (a) competition policy is mentioned in the constitution; (b) a specific law promoting competition is in place; (c) law has been in place for a long time; (d) the law mentions no or few goals beyond competition; and (e) the law prohibits a high number of practices. The "economic approach" indicator reflects a higher value with: greater reliance on the rule of reason (instead of per se rules) with regard to up to eight practices often considered to be anti-competitive; greater reliance on a number of concepts that have been promoted by economists in recent years (such as collective dominance, conglomerate effects); and greater reliance on both remedies and efficiencies in its merger policy based on the assumption that both these instruments indicate a case-by-case rather than a per se approach. In terms of methodology, the FNI is based on surveys of agencies and covers 59 countries. There is no time series component to the survey.

[52] Stefan Voigt, *The Effects of Competition Policy on Development – Cross-Country Evidence Using Four New Indicators,* 45 J. DEV. STUD. 1225 (2009).

Instead, Voigt relies on "currently valid competition law" and hence presumably on law as it exists in 2008.

Voigt's "substantive law indicator" bears some resemblance to our CLI in that the index responds to the enactment of competition law. The index is also sensitive to the number of prohibitions embedded in that law. However, beyond that, the similarities are few. Voigt's substantive law indicator blends quantitative elements (i.e., how many prohibitions) with semi-qualitative elements (i.e., fewer goals lead to higher index), alongside some structural elements (i.e., is competition mentioned in the constitution). At the same time, Voigt's "economic approach" indicator is an attempt to capture purely qualitative elements of competition law, which represents a notable departure from CLI. Beyond these substantive differences, the FNI and CLI have a very different coverage, given that FNI captures 59 countries and is limited to a single year.

***6. Indicators for Competition Law and Policy* (CLP).** Finally, the CLP Indicators measure the strength and scope of competition regimes in 49 jurisdictions in 2013.[53] Relying on a survey conducted among competition agencies, the CLP captures these agencies perception of whether various features of their domestic competition laws prevent anticompetitive behavior. These features include: (1) the scope of action (including competences, investigative powers, sanctions/remedies and private enforcement); (2) policy on anticompetitive behaviors (including horizontal agreements, vertical agreements, mergers and exclusionary conducts); (3) probability of investigation (including independence, accountability and procedural fairness); and (4) competition advocacy. Like CPI, FNI, and Four Indicators, the CLP also attempts to measure whether the competition policy reflects generally recognized "good" practices.

A few similarities with the CLI exist, including the CLP's inclusion of sanctions/remedies and private enforcement in the measurement of the strength of competition law. However, the CLP rests on a very different foundation in attempting to measure how "good" or "effective" the law is. In terms of methodology, we expect our indexes to perform very differently given that the

[53] Enrico Alemani, Caroline Klein, Isabell Koske, Cristiana Vitale, & Isabelle Wanner. *New Indicators of Competition Law and Policy in 2013 for OECD and Non-OECD Countries* 59-102 (OECD Economics Department, Working No. 1104, 2013). These new indicators build on the earlier CLP indicators developed by Jens Høj in 2007. Jens Høj, *Competition Law and Policy Indicators for the OECD Countries* (OECD Economics Department, Working Paper No. 568, 2007), http://dx.doi.org/10.1787/122166455544.

CLP relies on enforcement agencies' own assessment of the quality of their competition regimes. Finally, the CLP is more limited in scope by focusing on a single year and on 49 jurisdictions, only.

7.2. Summary

Based on the above discussion, there are three points worth making to understand the relationship between the CLI and these six prior indexes. First, the above discussion has shown that our Index builds on the work done by others, most notably Hylton & Deng (2007) and Nicholson (2008), but substantially differs in substance and scope. Most importantly, no index created to date compares to our index in terms of the number of countries and years covered, as the below table illustrates.

Second, we elected to not follow other indexes that attempted to measure "quality" of competition law. It is notable that the CPI, the FNI, Four Indicators, and the CLP indexes all attempt to measure the quality of law as one or the key feature of the index. Few would dispute that quality of the law matters—we certainly do not. However, it is not easy to objectively measure quality, which led us to choose another path and focus on the law's stringency instead. We were hesitant to rely on agencies' own perception of the quality of their regimes or to use OECD or other similar guidelines as a benchmark. No such guidelines would also allow us to benchmark law's performance over centuries. Furthermore, we were cautious not to assume that there is a single objective quality standard that would apply for all jurisdictions across very different times in economic history. That said, we find the work done by others using this method valuable and endorse the view that those studies complement that of ours.

Third, while our CLI is not a quality index as such, our dataset can be deployed and the index adjusted in ways that capture qualitative properties of the law following some of the same methods on which the CPI relies. More specifically, our data can be used to measure the extent to which economic analysis is reflected in the country's statutes by focusing on elements such as the presence of an efficiency defense and its applicability to mergers, dominance and anticompetitive agreements. The acknowledgment of an efficiency defense in the law would reflect higher compatibility of the law with economic principles, leading to a higher quality index. At the same time, this qualitative index would be lower if the law recognized the more nebulous public interest defense in case of any or all these substantive provisions. Also, the recognition that mergers can be restricted for "public interest" would lower the quality score. In addition to

capturing the various defenses, the economic quality index would incorporate the degree to which competition laws are compromised by exemptions. These exemptions often reflect protectionist interests at the expense of a view that treats all market participants equally and subjects all industries and enterprise types to the domain of competition laws. Finally, our proposed quality index can take advantage of our coding of the policy goals that are embedded in laws. Some countries only list goals that are consistent with economic analysis, such as consumer welfare, total welfare, or efficiency, whereas other list goals including development and industrial policy. Thus, we welcome the deployment of our data in ways that try to capture the quality of the laws as well.

8. CONCLUSION

This Article has introduced a new quantitative indicator—the Competition Law Index—to measure the stringency of competition law across time and jurisdictions. We have drawn on original data on competition laws to construct a measure that captures the intensity of the competition regulation around the world from 1889 to 2010. While we are not the first to pursue this effort, for the first time we have an index that comprehensively quantifies competition laws across the near-complete universe of competition jurisdictions over the entire lifetime of competition laws.

That said, the CLI is purely a descriptive measure. It does not embed any notion of the higher CLI being normatively better than a lower one—or the other way around. There is no single optimal CLI that our study would endorse. However, the CLI conveys interesting information on the regulatory choices different countries make in adopting and maintaining competition regimes. Our ability to disaggregate the CLI also enhances our understanding as to the various ways that anti-competitive activity can be deterred. For instance, some countries might have less stringent substantive provisions but make up for such leniency with robust remedies. Alternatively, countries with a low CLI score may still achieve an optimal level of deterrence if they invest resources in actual enforcement and hence increase either the probability of detection or the level of sanctions.

Finally, we remain mindful that laws in the books tell only a partial story of the stringency of the entire competition regime. It is important to also know how law is enforced. We have separately collected data on countries' enforcement resources and activity across the same categories that the CLI measures, including cartels, abuse of dominance, and mergers. These data,

together with datasets and indexes built by other researchers, complement the information that the CLI coveys. Thus, we do not suggest that the CLI alone can answer all questions about evolution of competition laws across time and countries. But we remain hopeful that this index provides a new empirical foundation for many research projects that are underway or that will be forthcoming. For instance, we are currently using the CLI to research the relationship between trade and competition law to study how competition law diffuses across countries. The CLI can also improve the measurement in studies that seek to understand the effect of competition laws on market outcomes, including the relationship between competition policy and GDP, growth, innovation, market competition, or other macroeconomic variables.

FIGURES & TABLES

Figure 1: Construction of the Competition Law Index

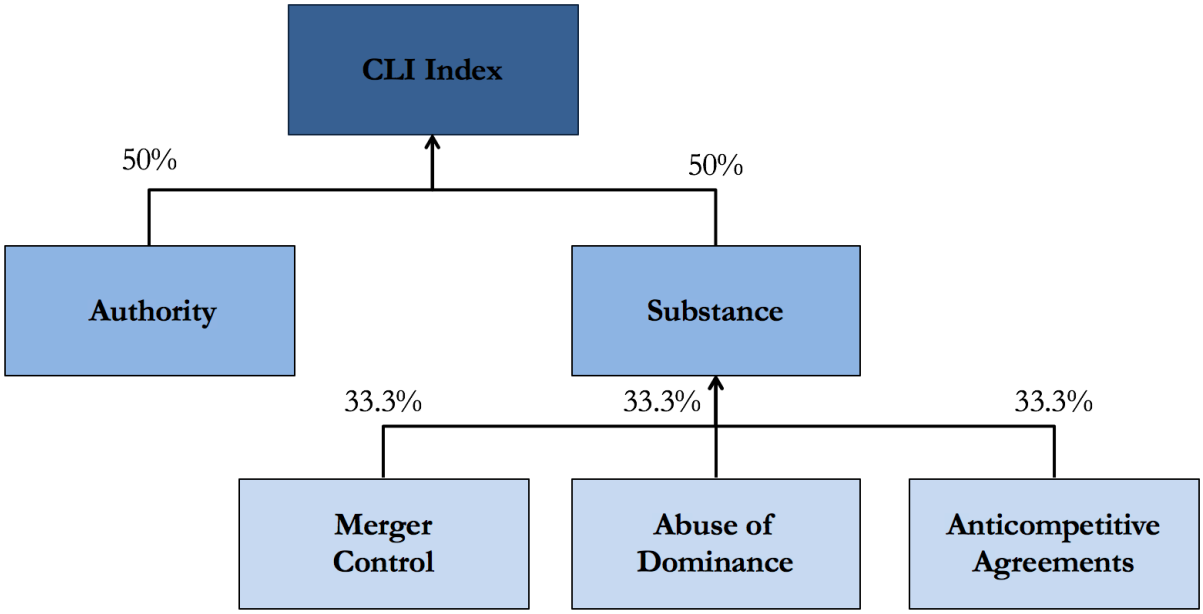

Table 1: Variables used to construct the Competition Law Index

Authority		Abuse of Dominance	
Private Right of Action	1	General prohibition	2
Fines	1	Market Access	0.25
Imprisonment	1	Tying	0.25
Divestitures	1	Discounts	0.25
Damages	1	Unfair Pricing	0.25
Extraterritoriality	1	Discriminatory Pricing	0.25
Industry Exemptions	-0.5	Predatory Pricing	0.25
Enterprise Exemptions – Categorical	-0.5	Retail price Maintenance	0.25
		Other abusive Acts	0.25
		Efficiency Defense	-0.5
		Public interest Defense	-0.5
Merger Control		**Anti-Competitive Agreements**	
Pre-merger Notification	1	Price fixing	0.5
Mandatory Notification	1	Market Sharing	0.5
Substantive Assessment: Economic	1	Output Limitations	0.5
Substantive Assessment: Public Interest	1	Bid Rigging	0.5
Efficiency Defense	-0.5	Tying	0.5
Failing Firm Defense	-0.5	Exclusive Dealing	0.5
Public Interest Defense	-0.5	Resale Price Maintenance	0.5
		Eliminate Competitors	0.5
		Efficiency Defense	-0.5
		Public Interest Defense	-0.5

Figure 2: Share and Number of Countries with Key Antitrust Provisions in 2010

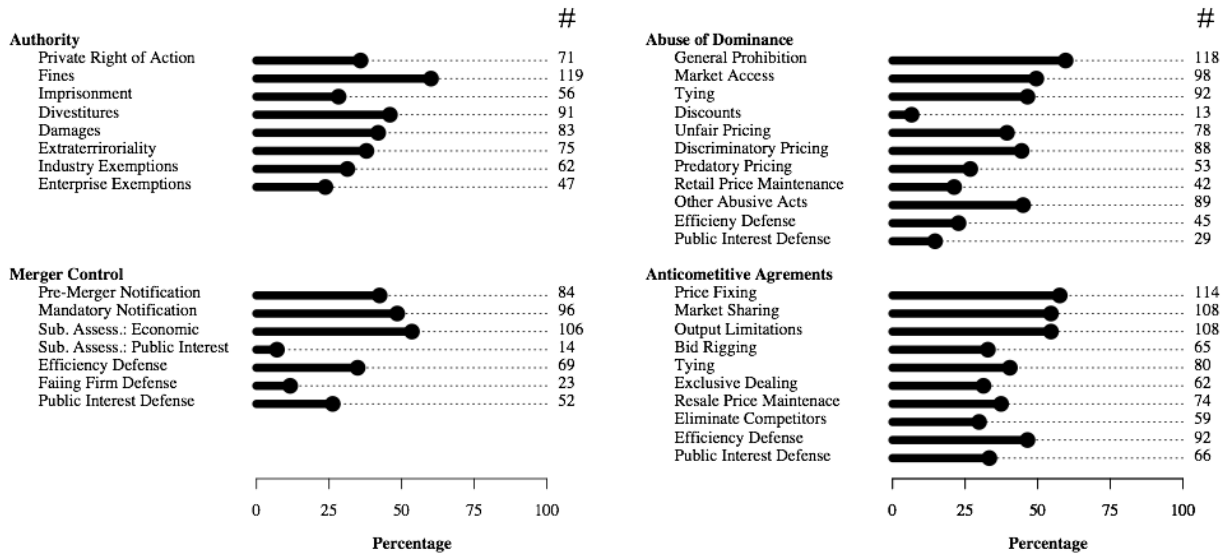

Figure 3: Distribution of CLI Scores in 2010

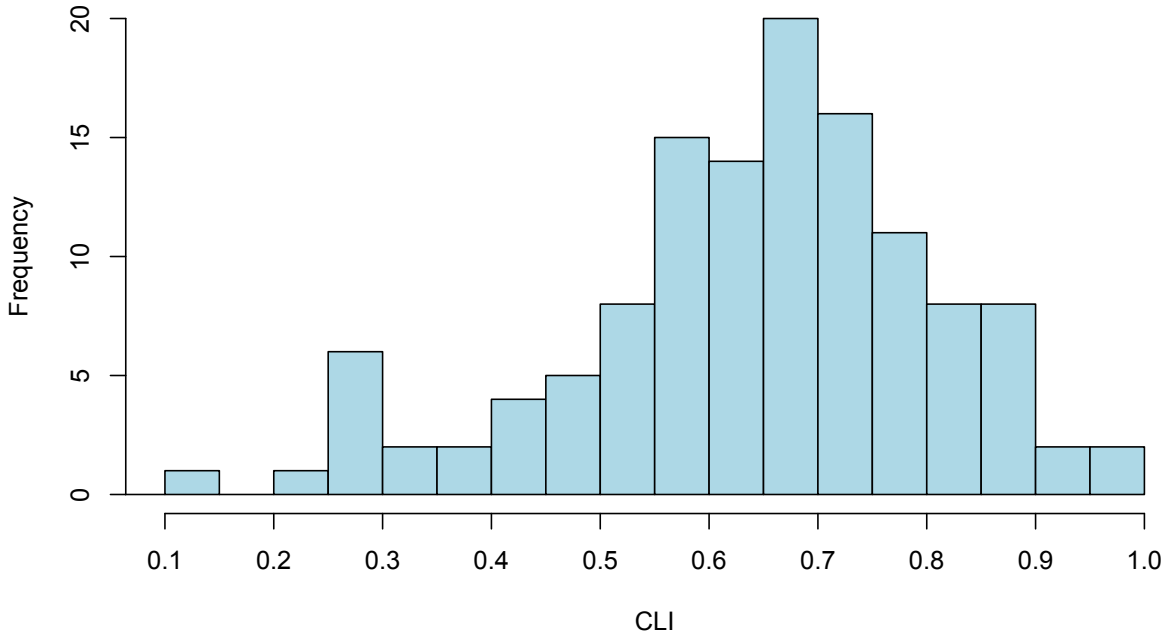

Figure 4: Competition Law Index by Country in 2010

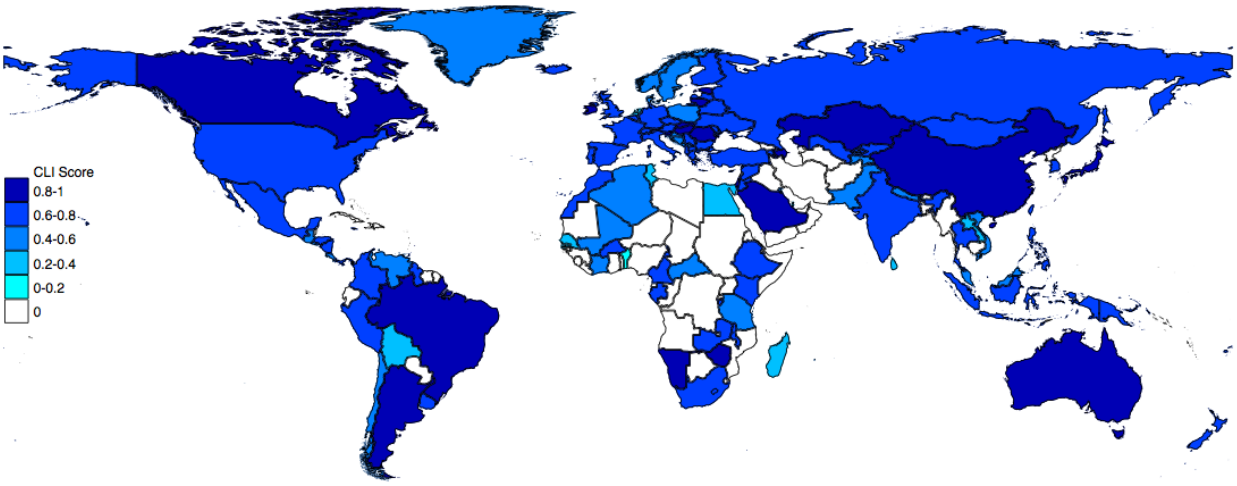

Figure 5: Average CLI Scores for Countries with Competition Laws, 1890 to 2010

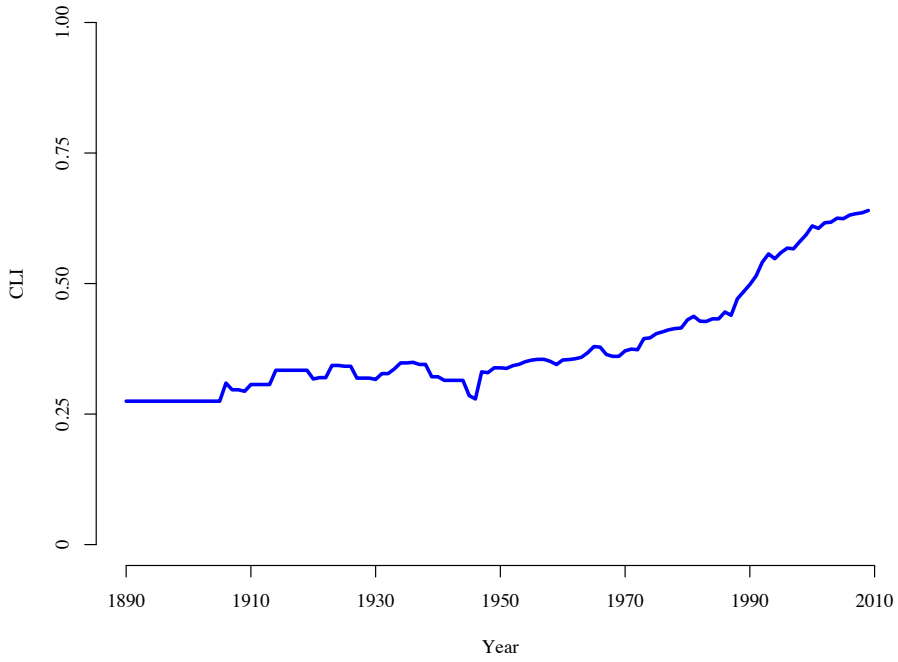

Figure 6: CLI Scores for Key Established Jurisdictions

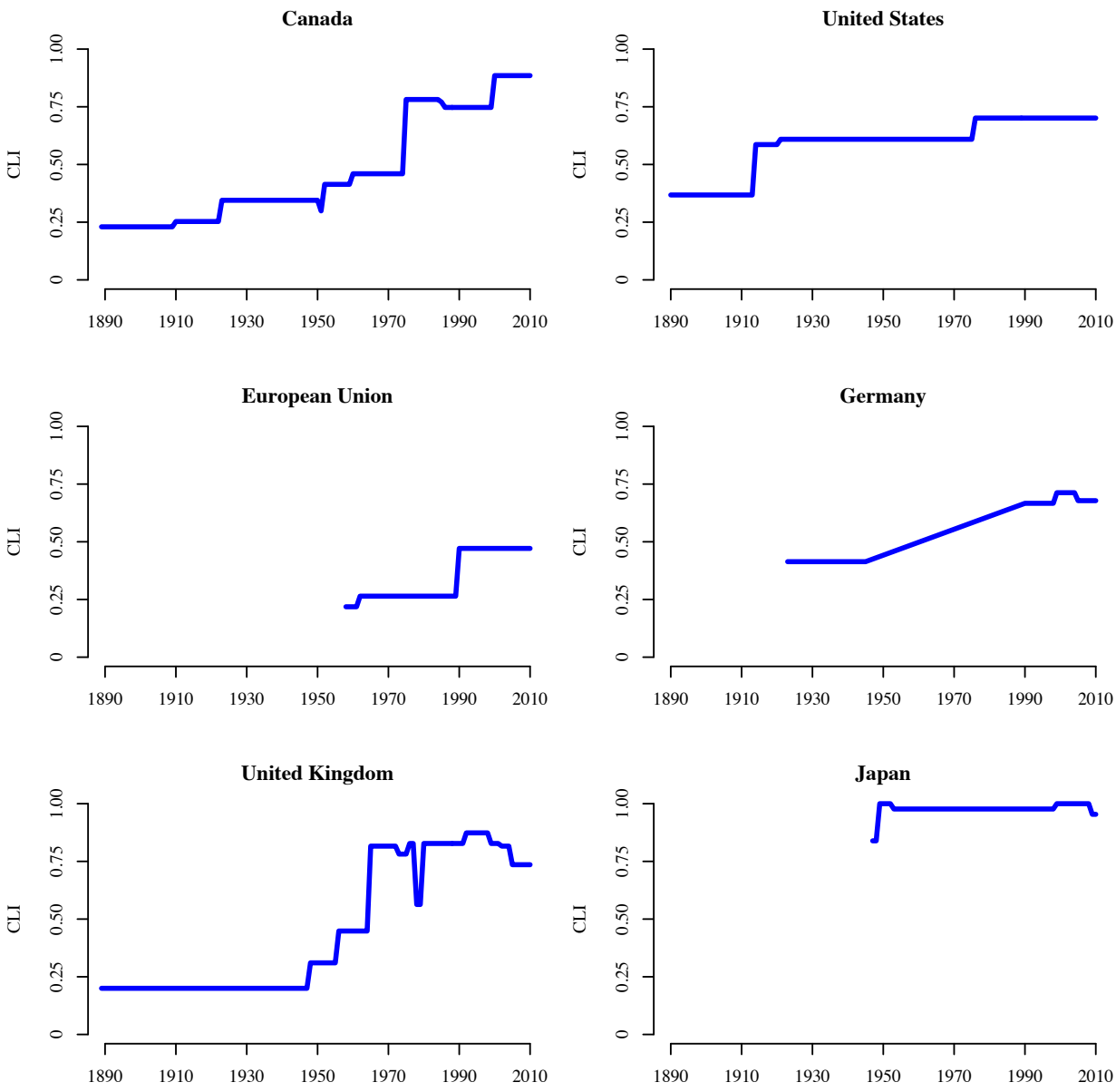

Figure 7: CLI Scores for BRIC Countries

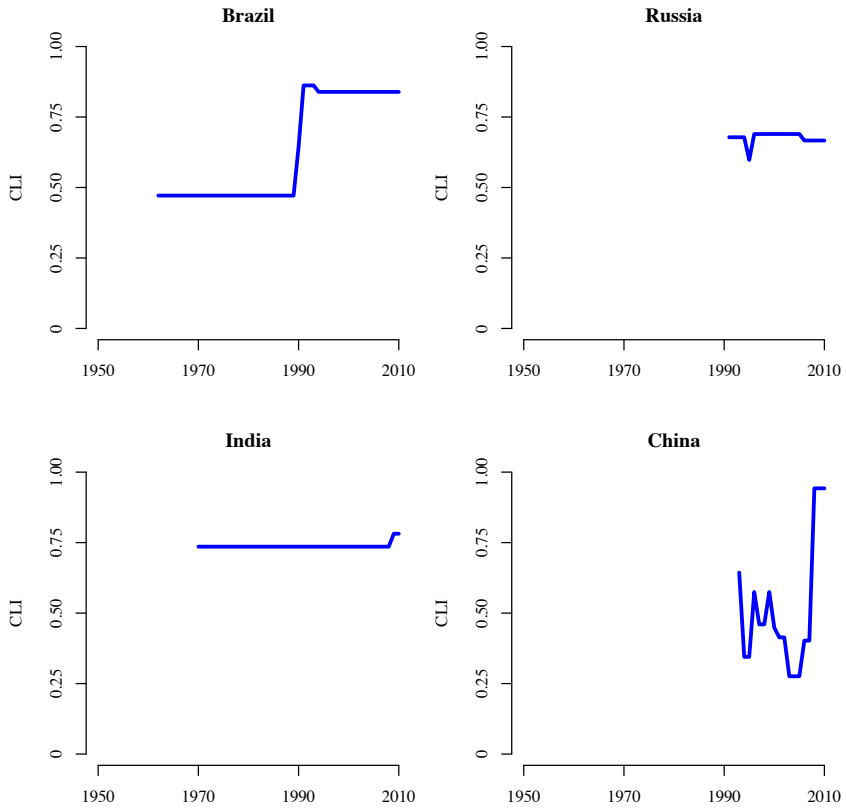

Figure 8: CLI Sub-Indexes

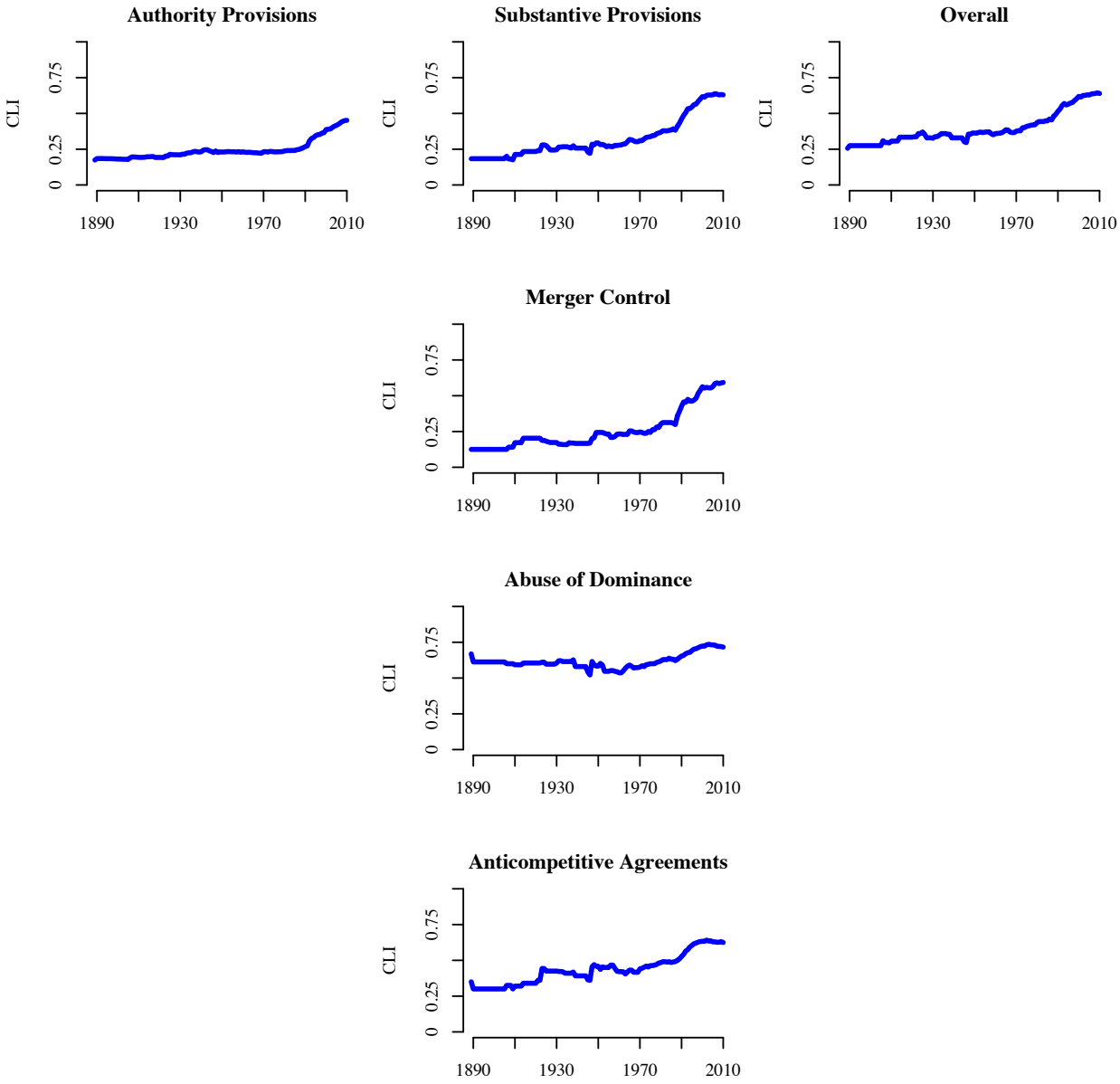

Figure 9: Number of Competition Law Provisions with Each Kind of Exemption in 2010

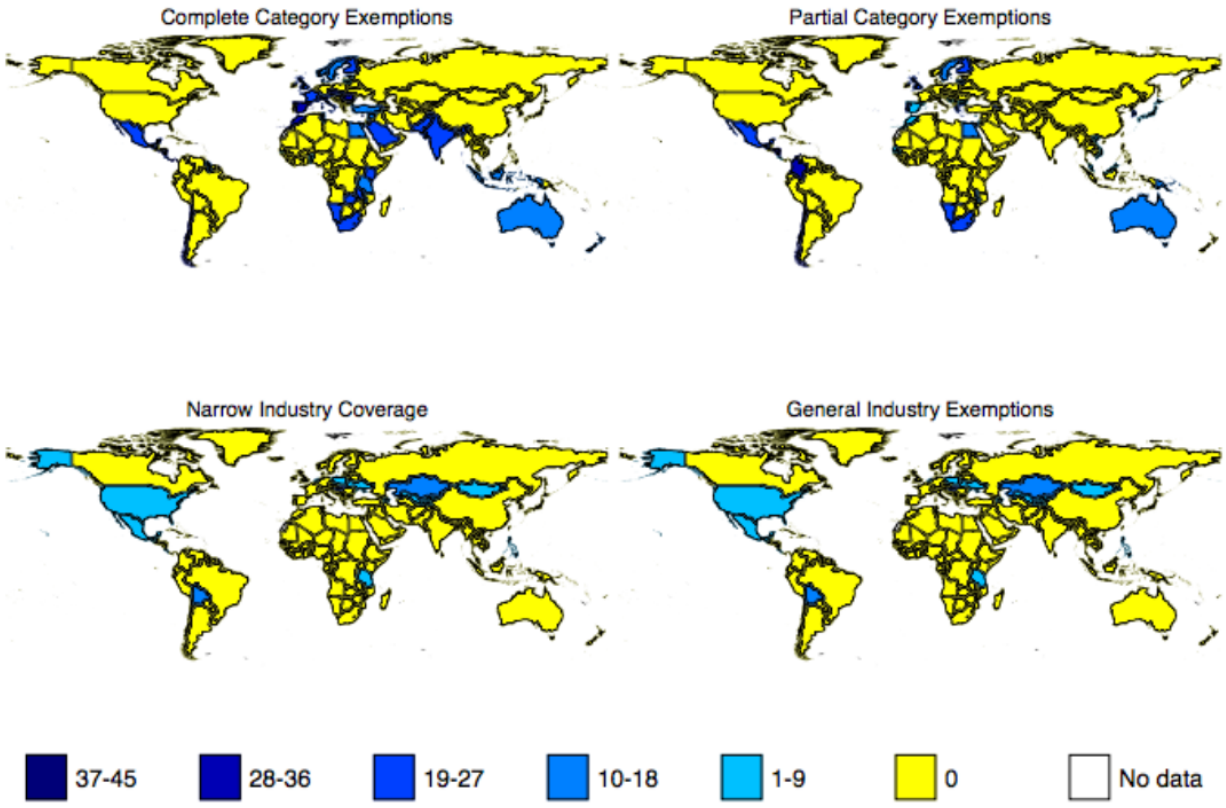

Figure 10: Exemption Adjusted Competition Law Index by Country in 2010

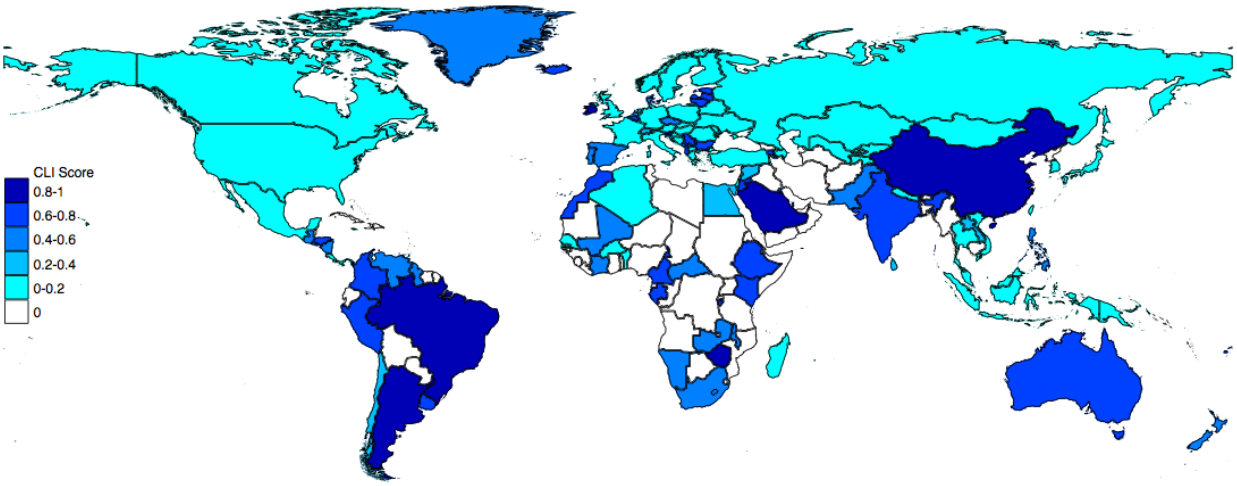

Table 2: Correlations Across Measures of Competition Law

	Competition Law Index	Authority	Merger Control	Dominance	Anticomp.Agreements	Exemption Adjusted CLI	Pricipal Component Analysis
Competition Law Index	1.00						
Authority	0.97	1.00					
Merger Control	0.78	0.67	1.00				
Dominance	0.89	0.78	0.68	1.00			
Anticomp.Agreements	0.88	0.80	0.67	0.76	1.00		
Exemption Adjusted CLI	0.72	0.72	0.49	0.63	0.58	1.00	
Pricipal Component Analysis	0.88	0.79	0.87	0.82	0.76	0.57	1.00

Table 3: Comparison of Existing Indexes

Name of the Index	Attempt to Measure	# of Countries	Years
Competition Law Index (CLI)	Stringency/scope of competition law	122	1889-2010
Antitrust Law Index (ALI)	Stringency/scope of competition law	52	2003
The Scope Index	Stringency/scope of competition law	102	2001-2004
Competition Policy Indexes (CPI)	Quality (=deterrence/effectiveness) of competition law, enforcement and institutions	13	1995-2005
Four New Indicators (FNI)	Substantive content of competition law, economic approach, de jure agency independence and de facto agency independence	59	2008
Four Indicators	Agency independence and consistency of law with economic theory	47	2004
Indicators for Competition Law and Policy (CLP)	Quality of competition law, process and institutions, including advocacy	49	2013

APPENDIX 1: CLI SCORES IN 2010 (EXCLUDING JURISDICTIONS WITH CLI SCORES OF 0)

		Sub-Indexes						
Country	CLI	Authority	Substance	Mergers	Dominance	Anti. Comp.	CLI Adjusted	PCA
Albania	0.78	0.86	0.65	0.75	0.88	0.40	0.79	10.44
Algeria	0.48	0.50	0.51	0.38	0.75	0.50	0.15	9.35
Argentina	0.94	0.86	0.98	0.88	0.88	1.00	0.95	9.08
Armenia	0.79	0.71	0.86	0.75	0.94	0.80	0.60	9.63
Australia	0.82	0.93	0.63	0.50	0.56	0.80	0.67	5.12
Austria	0.78	0.86	0.65	0.50	0.88	0.60	0.09	11.14
Azerbaijan	0.89	0.79	0.95	0.88	0.81	1.00	0.13	7.04
Barbados	0.83	0.93	0.65	0.63	0.63	0.70	0.57	9.06
Belarus	0.70	0.64	0.77	0.88	0.81	0.60	0.14	9.82
Belgium	0.61	0.57	0.67	0.63	0.81	0.60	0.62	10.35
Benin	0.14	0.36	0.00	0.13	0.00	0.20	0.10	-1.53
Bolivia	0.30	0.21	0.51	0.13	0.75	0.70	0.00	3.07
Bosnia and Herzegovina	0.56	0.50	0.67	0.63	0.94	0.50	0.11	8.68
Brazil	0.84	0.86	0.77	0.38	0.94	0.90	0.85	10.15
Bulgaria	0.74	0.86	0.56	0.63	0.75	0.40	0.73	11.66
Burkina Faso	0.68	0.79	0.53	0.13	0.81	0.70	0.06	5.21
Burundi	0.67	0.71	0.60	0.75	0.63	0.50	0.67	8.98
Cameroon	0.71	0.86	0.51	0.63	0.50	0.50	0.72	7.50
Canada	0.89	0.93	0.77	0.63	0.56	1.00	0.12	7.20
Central African Republic	0.48	0.57	0.42	0.75	0.38	0.30	0.49	3.81
Chile	0.54	0.50	0.63	0.13	0.81	0.90	0.38	2.88
China	0.94	1.00	0.79	0.88	0.88	0.60	0.95	10.94
Colombia	0.79	0.71	0.86	0.75	0.81	0.90	0.72	9.01
Costa Rica	0.60	0.43	0.84	0.63	0.88	0.90	0.05	9.28
Croatia	0.54	0.50	0.63	0.63	0.81	0.50	0.15	11.49
Cyprus	0.75	0.71	0.77	0.88	0.81	0.60	0.12	10.25
Czech Republic	0.69	0.64	0.74	0.75	0.88	0.60	0.55	9.51
Denmark	0.52	0.36	0.77	0.88	0.81	0.60	0.43	7.05
Egypt	0.33	0.36	0.40	0.38	0.56	0.40	0.23	5.47
El Salvador	0.57	0.50	0.70	0.75	0.75	0.60	0.46	8.95
Estonia	0.86	0.93	0.72	0.75	0.69	0.70	0.73	9.92
Ethiopia	0.67	0.71	0.60	0.63	0.75	0.50	0.67	9.25
Fiji	0.70	0.71	0.67	0.63	0.56	0.80	0.71	2.80
Finland	0.63	0.57	0.72	0.88	0.69	0.60	0.05	8.78
France	0.78	0.86	0.65	0.63	0.75	0.60	0.15	10.53
Gabon	0.69	0.57	0.84	0.88	0.75	0.80	0.70	6.34

Gambia	0.30	0.57	0.05	0.13	0.00	0.30	0.13	4.26
Germany	0.68	0.79	0.53	0.63	0.81	0.30	0.14	9.71
Greece	0.61	0.64	0.58	0.38	0.81	0.60	0.07	8.83
Greenland	0.46	0.43	0.56	0.38	0.75	0.60	0.47	7.83
Guatemala	0.44	0.57	0.33	0.13	0.50	0.50	0.44	-0.30
Guyana	0.64	0.79	0.47	0.13	0.63	0.70	0.50	3.20
Honduras	0.71	0.86	0.51	0.63	0.00	0.90	0.65	6.81
Hungary	0.80	0.79	0.79	0.88	0.88	0.60	0.02	10.76
Iceland	0.61	0.57	0.67	0.63	0.81	0.60	0.62	9.62
India	0.78	0.64	0.93	0.88	0.88	0.90	0.66	8.23
Indonesia	0.66	0.57	0.77	0.50	0.69	1.00	0.01	3.68
Ireland	0.87	0.86	0.84	0.88	0.88	0.70	0.88	8.34
Israel	0.89	0.93	0.77	0.88	0.94	0.50	0.18	8.88
Italy	0.66	0.57	0.77	1.00	0.81	0.50	0.07	9.70
Ivory Coast	0.56	0.71	0.40	0.25	0.56	0.50	0.57	4.29
Jamaica	0.70	0.79	0.58	0.13	0.69	0.90	0.07	4.34
Japan	0.95	0.93	0.91	0.75	0.94	0.90	0.11	9.93
Jersey Channel Islands	0.64	0.71	0.56	0.75	0.63	0.40	0.65	9.82
Jordan	0.64	0.71	0.56	0.63	0.50	0.60	0.65	10.72
Kazakhstan	0.85	0.79	0.88	0.88	0.88	0.80	0.13	9.06
Kenya	0.78	0.64	0.93	0.88	0.75	1.00	0.64	8.29
Kosovo	0.59	0.57	0.63	0.63	0.81	0.50	0.58	8.02
Kuwait	0.51	0.36	0.74	0.75	0.63	0.80	0.40	8.06
Kyrgyzstan	0.68	0.79	0.53	0.38	0.56	0.70	0.08	7.51
Laos	0.39	0.43	0.42	0.13	0.50	0.70	0.40	5.34
Latvia	0.66	0.57	0.77	0.88	0.81	0.60	0.66	9.59
Lithuania	0.82	0.86	0.72	0.88	0.81	0.50	0.77	10.08
Luxembourg	0.25	0.21	0.42	0.13	0.75	0.50	0.01	3.87
Macedonia	0.70	0.71	0.67	0.50	0.94	0.60	0.20	11.76
Madagascar	0.32	0.36	0.37	0.63	0.25	0.40	0.03	5.22
Malawi	0.61	0.64	0.58	0.38	0.44	0.90	0.43	5.35
Malaysia	0.52	0.64	0.40	0.13	0.81	0.40	0.03	5.18
Mali	0.45	0.57	0.35	0.13	0.44	0.60	0.45	0.14
Malta	0.57	0.50	0.70	0.63	0.88	0.60	0.60	9.96
Mauritius	0.56	0.57	0.58	0.63	0.44	0.70	0.03	5.99
Mexico	0.78	0.71	0.84	0.75	0.75	0.90	0.02	9.67
Moldova	0.68	0.64	0.72	0.75	0.81	0.60	0.10	8.64
Mongolia	0.66	0.50	0.86	0.63	0.94	0.90	0.12	9.72
Montenegro	0.56	0.43	0.77	1.00	0.81	0.50	0.57	8.49
Morocco	0.78	0.86	0.65	0.63	0.63	0.70	0.62	9.94

Namibia	0.80	0.93	0.60	0.63	0.50	0.70	0.58	10.31
Nepal	0.51	0.50	0.56	0.38	0.50	0.80	0.14	4.21
Netherlands	0.29	0.29	0.40	0.75	0.56	0.10	0.28	4.26
New Zealand	0.71	0.93	0.42	0.50	0.50	0.40	0.56	3.94
Nicaragua	0.64	0.79	0.47	0.25	0.75	0.50	0.46	9.92
Norway	0.54	0.50	0.63	0.88	0.56	0.50	0.01	9.12
Pakistan	0.57	0.50	0.70	0.63	0.88	0.60	0.47	8.60
Panama	0.68	0.71	0.63	0.38	0.69	0.80	0.03	9.24
Papua New Guinea	0.61	0.71	0.49	0.63	0.56	0.40	0.03	2.11
Peru	0.64	0.71	0.56	0.13	0.63	0.90	0.65	5.67
Philippines	0.70	1.00	0.30	0.25	0.56	0.30	0.52	4.78
Poland	0.56	0.50	0.67	0.63	0.81	0.60	0.08	10.74
Portugal	0.63	0.57	0.72	0.75	0.69	0.70	0.58	8.58
Qatar	0.28	0.21	0.47	0.50	0.63	0.40	0.20	6.58
Romania	0.84	0.86	0.77	0.63	0.94	0.70	0.06	10.32
Russia	0.67	0.64	0.70	0.88	0.63	0.60	0.10	8.44
Saudi Arabia	0.95	0.93	0.91	0.88	0.81	0.90	0.82	8.64
Senegal	0.22	0.21	0.35	0.13	0.56	0.50	0.00	-0.76
Singapore	0.57	0.50	0.70	0.75	0.75	0.60	0.47	7.32
Slovakia	0.84	0.86	0.77	0.88	0.81	0.60	0.10	8.92
Slovenia	0.87	0.93	0.74	0.50	1.00	0.70	0.88	11.99
South Africa	0.75	0.93	0.49	0.25	0.81	0.50	0.53	8.85
South Korea	0.69	0.64	0.74	0.63	0.88	0.70	0.09	7.87
Spain	0.62	0.50	0.79	0.88	0.88	0.60	0.49	9.67
Sri Lanka	0.25	0.43	0.14	0.00	0.38	0.30	0.26	1.18
Sweden	0.56	0.57	0.58	0.50	0.81	0.50	0.04	9.71
Switzerland	0.69	0.71	0.65	0.75	0.75	0.50	0.27	9.97
Syria	0.67	0.71	0.60	0.63	0.50	0.70	0.30	9.75
Taiwan	0.74	0.79	0.65	0.75	0.63	0.60	0.11	6.49
Tajikistan	0.55	0.64	0.47	0.88	0.50	0.20	0.10	3.76
Tanzania	0.53	0.71	0.33	0.50	0.25	0.40	0.00	6.56
Thailand	0.68	0.57	0.81	0.88	0.81	0.70	0.06	6.84
Trinidad and Tobago	0.67	0.64	0.70	0.88	0.63	0.60	0.13	7.46
Tunisia	0.38	0.43	0.40	0.38	0.56	0.40	0.00	6.16
Turkey	0.68	0.57	0.81	0.88	0.81	0.70	0.11	8.48
Ukraine	0.78	0.79	0.74	0.63	0.88	0.70	0.16	12.70
United Kingdom	0.74	0.79	0.65	0.63	0.75	0.60	0.11	9.51
United States of America	0.70	0.79	0.58	0.88	0.56	0.40	0.17	4.85
Uruguay	0.78	0.71	0.84	0.75	0.75	0.90	0.79	9.88
Uzbekistan	0.62	0.64	0.60	0.63	0.63	0.60	0.13	10.59

Venezuela	0.57	0.57	0.60	0.63	0.50	0.70	0.58	7.33
Vietnam	0.59	0.50	0.72	0.50	0.94	0.70	0.16	11.10
Yugoslavia	0.75	0.86	0.58	0.50	0.81	0.50	0.76	8.68
Zambia	0.71	0.79	0.60	0.50	0.63	0.70	0.57	9.74
Zimbabwe	0.89	1.00	0.67	0.63	0.69	0.70	0.90	7.19

APPENDIX 2: DESCRIPTION OF VARIABLES USED TO CONSTRUCT THE CLI

Authority Provisions	
Private right of action	This variable indicates whether private parties are entitled to file lawsuits to seek remedies.
Fines	This variable indicates whether the law provides for fines as a remedy for violating the law.
Imprisonment	This variable indicates whether the law provides for imprisonment as a punishment for violating provisions of the law.
Divestitures	This variable indicates whether the law allows for divestitures as a remedy. These may entail 1) selling of assets or division of the company as a remedy for non-merger-related antitrust violations or 2) for the merger control authority to make the approval of a merger conditional on divestiture (or allow it to force divestiture if the firms proceed with the merger without it).
Damages	This variable indicates whether the law allows injured parties to obtain damages. Remedies available for third parties may include either monetary damages or injunctions.
Extraterritoriality	This variable indicates whether the law applies extraterritorially (i.e., it applies to foreign companies and citizens as long as the activity has some effect in the country applying its law).
Industry exemptions	This variable indicates whether any industries or economic sectors or types of economic activities are excluded from the application of this antitrust law.
Enterprise Exemptions – categorical	This variable indicates whether this law categorically or completely exempts any of the following categories of enterprises from the application of this law categorically (i.e., completely as opposed to partially or conditionally): - export cartels - state-owned enterprises - state-operated or state-designated trading companies - designated monopolies - other categories of enterprises

Substantive Prohibitions	
Merger Control	
Pre-merger notification	This variable identifies whether the law provides for a pre-notification of mergers (i.e., where the notification must take place before the closing).
Mandatory notification	This variable indicates if the law provides for a mandatory merger notification.
Substantive assessment: economic	This variable identifies whether the law directs the agency to consider the effect of the merger on market competition, such as anti-competitive consequences for the structure of the market or possible barriers to entry or, alternatively, the resulting dominant position or market share of the merged entity.
Substantive assessment: public interest	This variable identifies whether the law grants the agency the power to prohibit a merger if the merger runs contrary to public interest.
Efficiency defense	This variable identifies whether an otherwise impermissible merger may be allowed if it will contribute sufficiently to economic efficiency.
Failing firm defense	This variable identifies whether an otherwise impermissible merger may be allowed if it prevents a business failure.
Public interest defense	This variable identifies whether an otherwise impermissible merger may be allowed because it is in the public interest.
Abuse of Dominance	
General prohibition	This variable identifies if the law prohibits the abuse of a dominant position, either generically or by specifying actions that would constitute an impermissible abuse of a dominant position.
Market Access	This variable identifies if the law prohibits a dominant firm from limiting the supply of goods to the market or from restricting sales to certain purchasers or consumers (refusal to supply).
Tying	This variable identifies if the law prohibits a dominant firm from conditioning the sale of products or services on the sale or acquisition of another product or service that is not directly connected (tying).
Discounts	This variable identifies if the law prohibits a dominant firm from offering discounts that incentivizes the buyer to deal exclusively or predominantly with the dominant firm (loyalty discounts).

Unfair pricing	This variable identifies if the law prohibits a dominant firm from taking advantage of its dominant position when setting its prices (unfair pricing).
Discriminatory pricing	This variable identifies if the law prohibits a dominant firm from imposing different prices for the same goods or services for different customers (discriminatory pricing).
Predatory pricing	This variable identifies if the law prohibits a dominant firm from engaging in predatory pricing.
Resale Price Maintenance	This variable identifies if the law prohibits a dominant firm from setting the price at which retailers will ultimately sell their product to consumers (resale price maintenance).
Other abusive acts	This variable identifies if the law prohibits a dominant firm from engaging in any acts—other than those specified in the preceding questions—as constituting an impermissible abuse of a dominant position, or indicates that the acts that are specified in the law do not constitute a comprehensive list of impermissible acts.
Efficiency defense	This variable indicates if an otherwise impermissible act by a dominant company is excused if it substantially contributes to economic efficiency.
Public interest defense	This variable indicates if an otherwise impermissible act by a dominant company is allowed if it contributes significantly to the public good.
Anticompetitive Agreements	
Price fixing	This variable identifies whether the law prohibits attempts to set the market price for a products (price fixing).
Market sharing	This variable identifies whether the law prohibits agreements to divide or allocate the market by a particular geographic, demographic, price- or otherwise-defined characteristic (market sharing).
Output limitations	This variable identifies whether the law prohibits agreements to limit the overall rate of production or amount of products made available to the market (output restraint).
Bid rigging	This variable identifies whether the law prohibits agreements not to bid on a tender for a certain product or to bid at or above a certain price (bid rigging).
Tying	This variable identifies whether the law prohibits companies from conditioning contracts on buying additional products that are not directly connected to the product that is the subject of the contract.
Exclusive dealing	This variable identifies whether the law prohibits agreements not to sell/buy their products to/from certain other companies or groups of companies.

Resale price maintenance	This variable identifies whether the law prohibits producers setting the price at which retailers will ultimately sell the product to consumers.
Efficiency defense	This variable identifies whether the law allows for an impermissible practice if it contributes significantly to economic efficiency.
Public interest defense	This variable identifies whether the law allows for an impermissible practice if it contributes significantly to the public good.