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## **ANTITRUST AROUND THE WORLD: AN EMPIRICAL ANALYSIS OF THE SCOPE OF COMPETITION LAWS AND THEIR EFFECTS**

KEITH N. HYLTON

FEI DENG

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# Antitrust Around the World: An Empirical Analysis of the Scope of Competition Laws and Their Effects

Keith N. Hylton\*

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December 2006

(forthcoming, *Antitrust Law Journal*, 2007)

**Abstract:** This paper investigates a dataset that codes key features of the competition laws of 102 countries. It first compares the scope of the laws overall, and of various subcomponents such as the law governing dominance, collusive conduct, and mergers. The second question examined in this paper is whether competition law has any effect on the intensity of competition within a nation. We find, in ordinary least squares regressions, that the scope of a country's competition law is positively associated with the perceived intensity of competition in the country's economy. However, we find no evidence that the scope of competition law is positively associated with an objective proxy of the intensity of competition. Moreover, instrumental variables regressions, though preliminary, do not indicate that the scope of competition law affects the perceived intensity of competition.

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## I. Introduction

Since the early studies of Harberger,<sup>1</sup> Stigler,<sup>2</sup> and Posner<sup>3</sup> there has been an interest in empirical evidence on the effectiveness of antitrust law in securing its goals.<sup>4</sup> That there have been relatively few such studies is attributable to the lack of useful statistical information on the law, enforcement policies, and penalties.

This paper presents an effort to use information on competition laws around the world to assess the scope and effectiveness of the law. The foundation of this study is a dataset that codes key features of the competition laws of 102 countries.<sup>5</sup> The paper first compares the scope of the laws overall, and for various subcomponents such as the law governing dominance, collusive conduct, and mergers. The second question examined in this paper is whether a nation's competition law has any effect on the intensity of competition within its borders.

Coding information on the law permits us to compare competition law regimes according to a fixed though somewhat arbitrary metric. Moreover, it allows us to summarize a rich array of information from more than 100 countries in compact form. Key to our approach is the construction of "scope indexes" to measure the breadth of the overall competition law and that of various subparts, such as the law on dominance or on mergers. The indexes provide quantitative measures of the size of the overall "competition law net" in a country, or the various smaller nets designed to cover specific

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<sup>1</sup> Arnold C. Harberger, *Monopoly and Resource Allocation*, 44 AM. ECON. REV. 77 (1954).

<sup>2</sup> George J. Stigler, *The Economic Effects of the Antitrust Laws*, 9 J.L. & ECON. 225 (1966).

<sup>3</sup> Richard A. Posner, *A Statistical Study of Antitrust Enforcement*, 13 J.L. & ECON. 365 (1970).

<sup>4</sup> For a single volume that contains many empirical studies of antitrust see THE CAUSES AND CONSEQUENCES OF ANTITRUST: THE PUBLIC-CHOICE PERSPECTIVE (Fred S. McChesney & William F. Shugart II eds., 1995) [hereinafter McChesney]. In 2003, the *Journal of Economic Perspectives* published a debate on the effectiveness of antitrust law. See Jonathan B. Baker, *The Case for Antitrust Enforcement*, 17 J. ECON. PERSP. 27 (2003); Robert W. Crandall & Clifford Winston, *Does Antitrust Policy Improve Consumer Welfare? Assessing the Evidence*, 17 J. ECON. PERSP. 3 (2003). For additional commentary on the JEP debate see GREGORY J. WERDEN, THE EFFECT OF ANTITRUST POLICY ON CONSUMER WELFARE: WHAT CRANDALL AND WINSTON OVERLOOK, (AEI-Brookings Joint Center For Regulatory Studies ed., Apr. 2004) (available <http://aei.brookings.org/admin/authorpdfs/page.php?id=933>). The most recent empirical studies attempt to assess the impact of competition law using data from a broad sample of countries. See Bernard Hoekman & Hiau Looi Kee, *Imports, Entry and Competition Law as Market Disciplines* (Feb. 2003) (unpublished manuscript, on file with Social Science Research Network) (available <http://ssrn.com/abstract=392682>); Michael Krakowski, *Competition Policy Works: The Effect of Competition Policy on the Intensity of Competition - An International Cross-Country Comparison* (Sept. 2005) (unpublished manuscript, on file with Social Science Research Network) (available <http://ssrn.com/abstract=854908>); Stefan Voigt, *The Economic Effects of Competition Policy - Cross-Country Evidence Using Four New Indicators* (Sept. 2006) (unpublished manuscript, on file with Social Science Research Network) (available <http://ssrn.com/abstract=925794>). For region-specific empirical studies see Russell W. Pittman, *Abuse-of-Dominance Provisions of Central and Eastern European Competition Laws: Have Fears of Over-Enforcement Been Borne Out?* 27 WORLD COMP. 245 (2004); Maria Coppola Tineo & Russell W. Pittman, *Abuse of Dominance Enforcement under Latin American Competition Laws* (March 2006) (unpublished manuscript on file with Social Science Research Network) (available <http://ssrn.com/abstract=888186>).

<sup>5</sup> Keith N. Hylton, Sean Miller, and Nicola Leiter, *Antitrust Around the World Database*, Boston University Law School, August 2006.

subject matters. The quantitative measures could be treated as measures of “antitrust risk” within each country and region examined.

These comparative assessments would be quite difficult to do using a purely descriptive approach toward the law. Indeed, we are inclined to argue that the primary goal of this paper is to encourage the gathering of statistics on the law of competition, its enforcement procedures, and its penalty provisions. As a theoretically and doctrinally top-heavy field, the time has long passed for antitrust law to be subjected to empirical analysis.

The first part of this study examines the variation in the scope of competition laws around the world. With 102 countries, we have presented much of our comparative analysis on the basis of regions (North America, South America, EU Europe, etc). In terms of overall scope, the strongest regions are predictably North America and EU Europe. If the scope of EU competition law is determined on the basis of national competition statutes, EU Europe follows closely behind the North America region. If, on the other hand, the scope of EU law is determined on the basis of EU Treaty law, EU Europe is by far the strongest region in the world. The weakest regions are South America and Central America. However, there are detailed results that sometimes go against predictions based on intuition or common information. For example, Central America, while overall weak, is one of the stronger regimes in terms of collusive practices – the parts deemphasized there are mergers and monopoly abuse.

The second part of the paper uses a measure of the overall scope of the country’s competition law (*Scope Index*) to determine whether the size of a country’s competition law net is associated with the intensity of competition in that nation’s economy. We use two variables as proxies for the intensity of competition. One, a subjective measure, is the World Economic Forum’s survey measure of the perceived intensity of local competition.<sup>6</sup> The WEF’s survey measure runs from a low of 1 (perception that competition is limited) to 7 (competition is perceived as intense). The other variable, an objective proxy, is the Purchasing Power Parity exchange rate.

We find evidence, in ordinary least squares regressions, that the scope of a country’s competition law is positively associated with the perceived intensity of local competition. Specifically, a one point increase in the Scope Index, our measure of the law’s scope, is associated with a .02 increase in the WEF’s Competition Intensity survey measure, which appears to be equivalent in impact to the effect of increasing a country’s per capita GDP by \$1000.

We also examine the effects of various components of competition law, such as the law on dominance, restrictive trade practices, mergers, and penalties. Our regressions suggest that increasing the range of remedies available to enforcement authorities has the largest

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<sup>6</sup> World Economic Forum, *Global Competitiveness Report 2004*, at 506; World Economic Forum, *Global Competitiveness Report 2003*, at 623. The competition intensity survey measure is defined as follows: Intensity of Local Competition: Competition in the local market is (1=limited in most industries and price-cutting is rare, 7 = intense in most industries as market leadership changes over time).

impact on perceived competition intensity. We find no evidence that increasing the scope of merger or dominance law increases perceived competition intensity – indeed, there is weak evidence that increasing the scope of dominance law reduces the intensity of competition.

Of course, given the subjective nature of the proxy for competition intensity,<sup>7</sup> as well as causation issues, this evidence should be taken as tentative or preliminary at best. In addition, we find no evidence that increasing the scope of a country’s competition law has an impact on our objective proxy for competition intensity, PPP.<sup>8</sup> Of course, this could be interpreted as evidence that PPPs are simply poor proxies of the effect of competition intensity on prices.

There are serious causation or endogeneity issues that suggest that the estimates of the impact of the Scope Index, based on ordinary least squares regressions, are biased. The least squares estimates in the regressions that use the subjective proxy are based on an assumption that the scope of the law influences the perceived intensity of competition and is not itself simultaneously influenced by the perceived intensity of competition. This is a questionable assumption in the context of competition law.

In view of these issues, we ran instrumental variables regressions, which avoid the bias due to endogeneity, in order to see if the statistically significant impact of the law’s scope could be replicated within that framework. However, the instrumental variable regressions fail to show a statistically significant impact for the law’s scope.

Part II describes the coding procedure used for this study. Part III provides a statistical and visual summary of global competition regimes. Part IV presents a statistical analysis of the effects of competition laws.

## II. Coding Competition Law

The foundation of this study is an attempt to code the competition laws of 102 countries.<sup>9</sup> In order to do this, we developed a template, based on the approach taken by Michael Nicholson.<sup>10</sup> An example of the template appears in appendix Table A1, which presents our attempt to code the competition laws of New Zealand.

In order to construct the template, we listed the types of conduct generally prohibited under competition laws, the types of penalties that might be assessed under the laws, and the procedures for enforcing those laws. Following Nicholson’s method,<sup>11</sup> we divided

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<sup>7</sup> In defense of the subjective measure, we could argue that perception is probably accurate in most cases, and may be just as important as the “real” level of competition intensity. Perception, rather than reality, will drive the strategies adopted by firms.

<sup>8</sup> Other studies that have attempted to assess the impact of competition law on objective measures have failed to find a statistically significant impact. See Hoekman and Voigt, *supra* note 4.

<sup>9</sup> See Appendix, Table A4 *infra* pp. 57-59.

<sup>10</sup> Michael W. Nicholson, Quantifying Antitrust Regimes (Feb. 2004) (unpublished manuscript, on file with Social Science Research Network) (available <http://ssrn.com/abstract=531124>).

<sup>11</sup> *Id.*

the law into several key categories: Territorial Scope, Remedies, Private Enforcement, Merger Notification, Merger Assessment, Dominance, and Restrictive Trade Practices. Our classification system differs from that of Nicholson only in the Merger Assessment category, where we included information on “public interest” tests used in some merger statutes (see appendix Table A1). We searched each country’s competition statute to determine whether the prohibition or procedure is included within the country’s law, which generates the second and third columns of Table A1.

In some cases, the country’s competition statute revealed too little information about prohibited conduct to be useful as the sole source of information. The most famous example is the United States, which has the Sherman Act at the foundation of its competition laws. The core of the Sherman Act consists of two short provisions; Section 1, governing cartels, and Section 2, governing monopolies (or dominant firms). In these cases we examined common law and other reports to fill in the template. However, most countries have their competition laws codified in a statute or series of statutes.

Since competition laws are changing all the time, we were forced to restrict our time period for constructing the templates. The information we have coded covers the time period January 2001 to December 2004. Changes in competition law that occurred after December 2004 are not reflected in this study. In some cases, a country’s law changed between 2001 and 2004. When this occurred, we filled out two (or more) templates to reflect the different regimes within a particular country during the time period of our sample. Ideally, a study such as this would attempt to code for the status of each country’s competition law for each time period of its existence. This would generate a sample running from 1889, the date Canada’s competition law was enacted, to the present. Given our limited time period, this study should be viewed as a preliminary or provisional attempt to lay the groundwork for a much larger project.

This is, admittedly, a crude attempt to code the law. The template does not permit us to code for detailed differences in the competition laws among countries. For example, predatory pricing is, as a matter of formal law, prohibited in both United States and the European Union. However, the detailed common law reflects important differences between the two regimes. The *Brooke Group* test has erected an extremely difficult evidentiary burden for predation plaintiffs in the U.S., requiring them to show that price is below some proxy for marginal cost and that the defendant had a strong likelihood of recouping its predatory investments.<sup>12</sup> European predation law, however, does not include a recoupment test, and sets up a presumption of unlawful predation if price is below some proxy for marginal cost.<sup>13</sup> The practical result is that although predation is prohibited by the competition laws of both Europe and the U.S., predation plaintiffs expect to lose in the U.S. while they are not so pessimistic in Europe.

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<sup>12</sup> *Brooke Group, Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 240-242 (1993); *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 595-598 (1986).

<sup>13</sup> *See, e.g., Case T-83/91 Tetra Pak Int’l SA v. Commission*, 1994 E.C.R. II-755, 4 C.M.L.R. 726 (1997), *aff’d* C-333/94, 1996 E.C.R. I-5951, 4 C.M.L.R. 662 (1997); *Case C-62/86, AKZO Chemie BV v. Commission*, 1991 E.C.R. I-3359; *see also*, John Vickers, *Abuse of Market Power*, 115 THE ECONOMIC JOURNAL F244, F248 (June 2005).

Another shortcoming of the template in Table A1 is that it includes categories that may overlap with other categories. For example, the list of prohibited types of conduct for dominant firms includes “abusive acts” and “obstacles to entry”. In most competition law regimes, the creation of an obstacle to entry by a dominant firm is simply a type of abusive act. Given this, we treated the abusive act line of the template as a catch-all that includes within it some of the more specific types of conduct included in the dominance portion of the template.

Yet another potential source of error is that the statutes are sometimes poorly written or written in such general terms that it is difficult to infer precisely what is prohibited. For example, a statute that prohibits “abusive acts” by dominant firms may or may not prohibit predatory pricing. As we noted earlier, we attempted to patch these cases by referring to case law or reports on enforcement. However, this is bound to result in some inconsistencies.

We attempted to minimize distortions created by the foregoing list of potential flaws by creating a set of definitions and attempting, as much as possible, to remain consistent with those definitions in coding the law.<sup>14</sup> In the end, we are unable to say whether our categories and their associated definitions are optimal. Perhaps an optimal coding system would not assume, as we do here, that the category “abusive acts” may contain other specified acts, such as creating “obstacles to entry”, as special cases. Some inconsistencies probably have resulted from our efforts use a set of fixed definitions to code the law, but this is unavoidable in any such effort.

For the most part the codes consist of 0 or 1, where 0 means that we could not find any provision in the law governing the specified conduct, penalty, or enforcement procedure. The key exception is found in the codes for merger notification regime. Some competition law regimes require notification while others simply permit or encourage notification<sup>15</sup> – this is the distinction between mandatory and voluntary merger notification. In addition, some competition law regimes require notification before the merger takes effect, and others permit notification after the merger takes effect.<sup>16</sup> There are four types of merger notification regime: mandatory premerger, voluntary premerger, mandatory postmerger, and voluntary postmerger. We chose a set of numbers that would rank the different merger notification regimes according to their restrictiveness. In terms of restrictiveness, we assumed the regimes should be ranked in the following order (from most to least restrictive): mandatory premerger, mandatory postmerger, voluntary premerger, voluntary postmerger. The numerical codes used for the merger notification portion guarantee this ranking of regimes.<sup>17</sup>

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<sup>14</sup> See Appendix, Index Definitions *infra* pp. 61-65.

<sup>15</sup> For examples see *Id.*

<sup>16</sup> For examples see *Id.*

<sup>17</sup> For the individual country templates, we used the following values: mandatory = 3, voluntary =1, premerger = 2, postmerger = 1. With these values, mandatory-premerger = 5, mandatory-postmerger = 4, voluntary-premerger = 3, and voluntary-postmerger = 2. For computing the index measuring the scope of the law, we reduced each of these scores by one, so that the ranking of merger notification regimes increases by one-digit increments from 0 (no requirements) to 4 (mandatory-premerger).



Instead of coding the law from national competition statutes, there is the alternative of coding law that takes into account the effects of regional treaties, the most important of which is the European Union Treaty. Because of the Treaty, member states of the European Union have a dual competition law regime. Competition disputes that are relatively large, in the sense that they affect trade among EU states, are resolved under EU law.<sup>18</sup> Competition disputes that are relatively small are resolved under the national competition statute. This means that in a practical sense there are two sets of competition law in every EU member state, one for big firms and one for small firms.

Even for large firms that conduct trade among EU member states, EU law is not the sole source of competition law that concerns them. Although EU law has a largely preemptive effect in the area of mergers, dominant firms, and restrictive trade practices; the EU will allow the member state to apply its own law with respect to an abuse of dominance if that law is more stringent than that of the EU.<sup>19</sup> In addition, the key area in which the EU law is not preemptive is that of private rights. Private enforcement is largely determined by the national competition statute. Specifically, whether an individual can sue for an antitrust violation and collect damages is a matter of the individual EU member-state's competition statute.<sup>20</sup> The appendix presents two completed templates for Belgium. The first one (Appendix Table A2) is based entirely on Belgium's competition statute. The second merges Belgium's law with that of the European Union.

### III. Variation in Competition Laws

In this section, we present a statistical and visual summary of the regional differences and variation in competition law regimes. The reason for examining regional differences is that they communicate a rough snapshot of the variation across regimes without burdening the reader with details on the competition laws of more than 100 countries. In addition, comparison of regional differences could be of value to a firm that operates regionally and has to assess the degree of "antitrust risk" in its area of operation.

We are aware of some of the drawbacks of the regional approach to comparisons. One appears in the case of Europe. We have divided the Europe sample into EU Europe and non-EU Europe. EU Europe consists, in this sample, of the 15 countries that were members during most of the time period of this sample, 2001- 2004 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands Portugal, Spain, Sweden, United Kingdom), plus the ten additional countries that were awaiting admission into the EU for most of this period and became members in May 2004 (Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland,

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<sup>18</sup> See, e.g., Wouter P.J. Wils, *The Modernization of the Enforcement of Articles 81 and 82 EC: A Legal and Economic Analysis of the Commission's Proposal for a New Council Regulation Replacing Regulation No. 17*, 24 *FORDHAM INT'L L.J.* 1655, 1656 (2001).

<sup>19</sup> See, e.g., William M. Hannay, *Transnational Competition Law Aspects of Mergers and Acquisitions*, 20 *Nw. J. INT'L L. & BUS.* 287, 291 (2000).

<sup>20</sup> CLIFFORD A. JONES, *PRIVATE ENFORCEMENT OF ANTITRUST LAW IN THE EU, UK AND USA* 46 (1999).

Slovakia, and Slovenia). We decided to include the ten countries awaiting admission in the EU sample because these countries had strong incentives to bring their law into line with EU law during the waiting period.

Another problem with the EU Europe category, noted before, is that the competition law of each of the EU countries falls under a general framework provided by the EU treaty. In general, EU law applies to matters that affect trade among the member states – in other words, undertakings by big firms trading across state borders. This means that the national laws are to some extent preempted, especially in the area of “restrictive trade practices,” which includes collusive conduct.

Obviously, a study of the laws declared in the national statutes of European countries fails to reflect the preemptive effect of EU law. On the other hand, the case for using information from the statutes of individual EU nations is that the individual statutes probably reflect domestic priorities. Although EU law applies to the big transnational matters in every member state, the zeal with which a particular state’s competition authority enforces EU competition law may be better reflected by the scope of that state’s competition statute. A country with a national statute that prohibits relatively few potentially anticompetitive acts has revealed a preference for a laissez-faire competition regime. That preference is likely to be reflected in that country’s attentiveness toward enforcing EU competition law.

Given the choice in the case of the European Union between coding information from national competition statutes and EU competition law, we have chosen to present information from both. We will present comparative results based entirely on national competition statutes, as well as results that incorporate EU competition law.

That is not as simple as merely coding for a common set of laws for all 25 EU members. For member states, EU law preempts some parts of the law, gives states options with respect to some parts, and opts for state law in other contexts. Specifically, EU law preempts the substantive law regarding restrictive trade practices. For restrictive-trade-practice disputes that come within the jurisdiction of the European Commission, individual member states are not free to apply rules that deviate from EU law.<sup>21</sup> With respect to dominance, member states are permitted to apply the law of their national statutes if that law is more restrictive than that of the EU.<sup>22</sup> Of course, as a practical matter, the EU’s law is the most restrictive. Finally, with respect to private rights of action, the law of the individual member state controls.<sup>23</sup>

## A. Measuring the Scope of Competition Law

### 1. Scope Index

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<sup>21</sup> Council Regulation 1/2003 of December 16, 2002, Regarding the Implementation of Competition Rules Laid Down in Articles 81 and 82 of the EC Treaty, art. 3(2), 2003 O.J. (L 1) 1, 8.

<sup>22</sup> *Id.*

<sup>23</sup> See Wils, *supra* note 18.

The first charts we present show *Scope Index* scores. These scores are found by summing the total points within each country template, and then subtracting off the defense scores. To give an example, return to the template for New Zealand. The Scope Index score for New Zealand is found by summing the numerical values in the template shown in Table 1, and then subtracting off scores associated with defenses (and one point to reduce the merger subtotal). In the case of New Zealand, there are three defenses (merger public interest defense, efficiency defense for dominant firms, efficiency defense for restrictive trade practices). The sum of the points is 19 (after reducing the merger subtotal), and after subtracting 3, the Scope Index for New Zealand is 16. For each European Union member state, an alternative Scope Index was computed based on EU law.<sup>24</sup>

The point of the Scope Index is to measure the size of the competition law net in every country. As the score increases, so does the size of the net. Alternatively, one can think of the Scope Index for a particular country as a measure of the number of ways in which a firm could run afoul of the competition laws in that country. However, the Scope Index score does not indicate the degree to which a country invests resources into enforcing its competition laws. Continuing with the net metaphor, the Scope Index tells us the size of the competition law net without saying anything about the likelihood that the government will attempt to swing the net at any firm.

Figures 1 and 2 present histograms of the number of countries for each Scope Index score. The first histogram shows the Scope Index scores after modifying each EU member state's law to reflect that of the EU. The second histogram shows the scores based entirely on national competition statutes.

Why look at both histograms? Clearly, a large firm operating within the European Union should worry about EU law. Why, then, should we consider the Scope Index based on national statutes? Several reasons can be offered. First, the law based on national statutes may provide a more accurate picture of the "real law" in every nation, since the national statutes presumably reflect local legislative preferences. At the least, the national statutes provide a measure of the minimum that should be expected of the national competition regimes. Second, an enterprise or concerted practice may be of a sort that, if located in Europe, would operate entirely within the borders of an EU member state. A price-fixing conspiracy, for example, might target the consumers of a specific country.

Figure 1 suggests immediately that for large firms – firms that would operate across borders if located within the EU – antitrust risk as measured by the law on the books is quite a bit higher in the European Union than in any other region of the world. The countries with the highest score (28) are all in the EU as of 2004: Austria, Cyprus, Estonia, France, Ireland, Spain, and the United Kingdom. By comparison, the score for the United States is 25. The country with the lowest score (2) is Paraguay.

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<sup>24</sup> See Appendix A2 *infra* pp. 53-54 for an example of templates for Belgium based on national law and on EU law.

Figure 1 has a roughly bimodal shape, suggesting that at least for large enterprises, antitrust risk can be described in terms of a division between the European Union and the rest of the world. The modal Scope Index for the EU region is 27, while that for the rest of the world is 20. Most of the countries at the rest-of-the-world modal score are from Asia and non-EU Europe. South American competition law regimes appear to be the weakest, measured in terms of the scope of the laws. Competition law regimes in Africa and in Central America are distributed evenly over the non-EU scores.

Figure 2 presents Scope Index scores based entirely on national statutes. Even when EU law is not taken into account, the most extensive national competition laws are generally found in EU Europe. Although, surprisingly, none of the EU Europe countries are among those with the highest Scope Indexes (based on national codes), most of the EU countries have scores in the upper half of the distribution, ranging from 18 to 24. The countries with the highest scores (25) are Australia (Oceania), Barbados (Caribbean), Belarus (non-EU Europe), Malawi (Africa), and the United States.

Both histograms show that African countries have more extensive laws than one might have guessed. One of the highest scores in Figure 2 belongs to an African country, Malawi; and the African countries are fairly evenly distributed over the range. Our intuition initially was that the group of relatively poor developing countries, of which Africa has a disproportionate share, would be the last to devote scarce resources to competition law enforcement. However, this intuition appears to be wrong.

If one were operating a company with a regional business base, the regional differences in competition law might be an important factor to consider. Exposure to antitrust risk is clearly greatest in EU-Europe and lowest in South America, Central America, and Africa. Of course, one might have predicted right away that these differences would be observed. Wealthier countries have more money to spend on their regulatory preferences than do poor countries. However, the chart allows one to quantify the magnitude of the differences, which we will explore in more detail shortly. Moreover, it reveals some anomalies, the most prominent of which is that Africa is stronger in terms of the scope of its competition laws than South America, which is the opposite of what one would expect if predicting on the basis of wealth.

## 2. Scope Index Minus Defenses

The Scope Index which we have presented measures the number of ways in which a firm could get into trouble under the nation's competition law, or, informally, the size of the competition law net. However, the Scope Index score says nothing about the number of defenses that are available to a firm. In other words, the Scope Index measures the size of the net without saying anything about the number of holes in it.

In order to get a measure of the size of the net that also takes into account the number of holes in it, we generated an alternative scope measure based on the scope score net of defenses. The Scope Index Minus Defenses is found by taking the Scope Index for each country and subtracting off the total score of the defenses permitted under the law. The

total score for defenses was computed by adding up scores for efficiency defenses permitted in the law and for the public interest defense in merger statutes.

Figures 3 and 4 show the distribution of the Scope Index Minus Defenses. Figure 3 is based on EU law, Figure 4 is based on national competition statutes. Again, one can think of Figure 4 as showing a minimal expectation of the law.

The bimodal shape that appeared in Figure 1 is replicated in Figure 3, which corrects the scope measure by taking defenses into account. Similarly, the roughly bell-shaped curve of Figure 2 is replicated in Figure 4.

In spite of these broad similarities, there are some important differences that appear when one takes defenses into account in trying to measure the scope of competition laws. Figures 3 and 4 show that subtracting defenses from the Scope Index generates a tighter distribution. In other words, taking defenses into account makes the world's antitrust regimes look more similar. In both Figures 3 and 4, the high scores move in closer to the median, while the low scores remain fixed. In Figure 3, the highest EU scores drop from 28 to 25. In Figure 4, the United States and Barbados fall to 22 from a score of 25, Australia to 21 from 25, Malawi to 23 from 25, and Belarus to 24 from 25. The modal scores for the non-EU countries in both Figures change little, reflecting the fact that most of the modal countries have modest efficiency defenses in comparison to the United States and to the EU. The leftward shift of both distributions, in comparison to Figures 1 and 2, is observed because the regimes with the most extensive prohibitions also have the most extensive defenses.

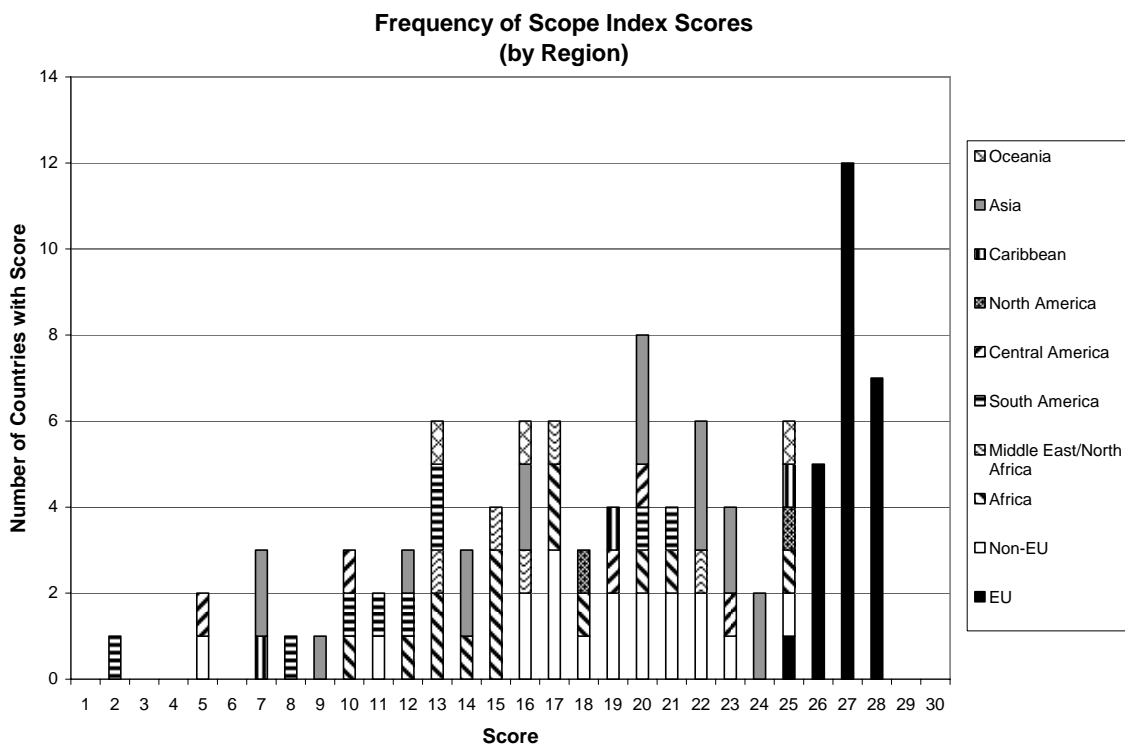


Figure 1: Histogram of Scope Index (with EU law)

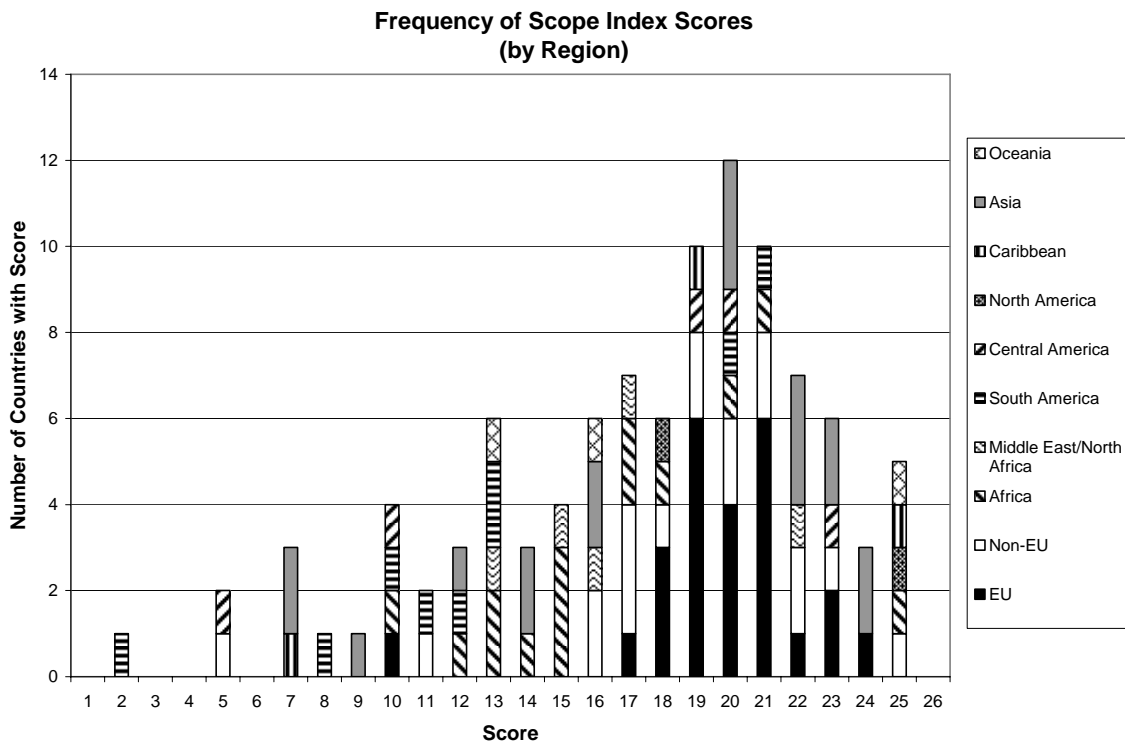


Figure 2: Histogram of Scope Index (national codes)

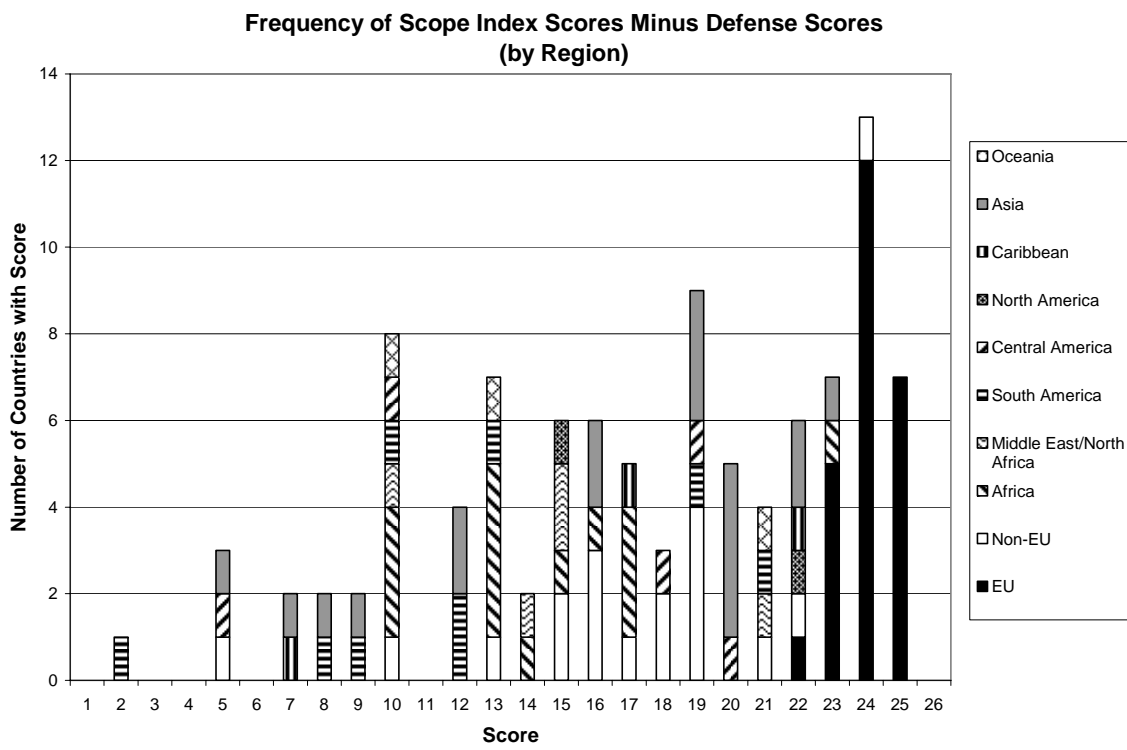


Figure 3: Histogram of “Scope Index Minus Defenses” with EU law

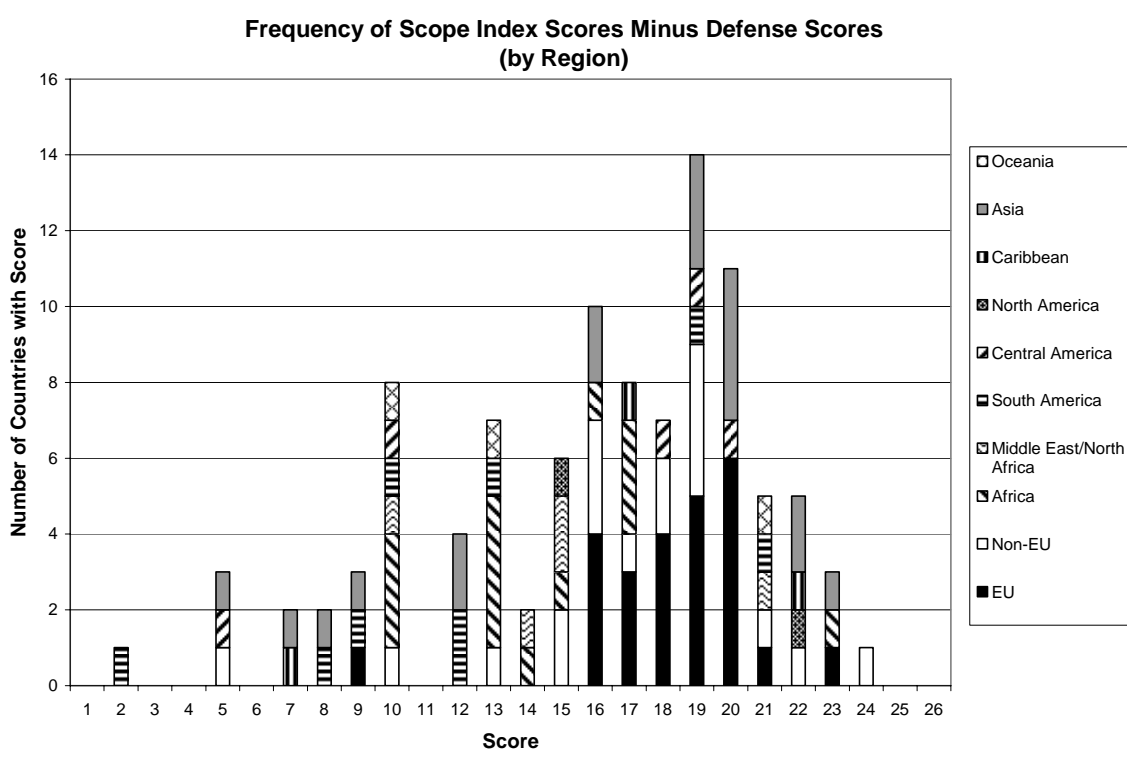


Figure 4: Histogram of “Scope Index Minus Defenses”

## B. Regional Comparisons by subject matter

In this section I compare regions according to the overall Scope Index and various sub-indexes measuring the scope of the law on certain subject matters, such as dominance (or, equivalently, monopolization). These comparisons provide a more detailed picture of the regional variation in the law, and allow us to quantify regional differences in the law.

### 1. Scope Index

The first comparison is of regional differences in the Scope Index. As both Figures 5 and 6 indicate, consistent with the histograms shown earlier, the strongest regimes are those of EU Europe and North America, with non-EU Europe following. When using EU law rather than the national competition statutes, the EU region is by far the strongest. When using national statutes (Figure 6) to determine the scope of regional competition laws, North America leads the EU. The weakest regimes are Central America and South America. The Middle East/North Africa, Caribbean, and Asian countries make up the middle ground.

Since the Scope Index scores can be considered as measures of the size of the competition law nets in these various regions, we can make rough quantitative assessments of the differences in legal regimes. Taking this approach, Figures 5 and 6 suggest that the competition law net in Africa is 31 percent larger than that in South America. The North American competition law net is 75 percent larger than that of South America. The competition law net for EU Europe, based on EU law rather than the national statutes, is by far the largest, roughly 25 percent larger than that of North America and more than double that of South America.

One gets a sense from Figures 5 and 6 of the great disparity between EU competition law and that of most other regimes. If we treat the Scope Index as a measure of weight, and we take the mean Scope Index as the rough balancing point for the various regimes, then Figures 5 and 6 show a dramatic change in balancing points when we shift from EU law to that of the national statutes. EU law and that of North America roughly balance the weight of the regimes from the rest of the world (Figure 5). When using national competition law statutes, the disparity in weights is not so great: the top four regions roughly balance the weight of the bottom five (Figure 6).

Translating this quantitative assessment of the law's scope into a statement about the risk of being penalized under a country's competition law requires the additional assumption that each country is equally likely to enforce the laws on its books. In other words, if the Scope Index is a measure of a country's competition law net, then it is a reasonable measure of antitrust risk only if enforcement authorities are equally likely to swing the net in each country. Obviously, this is incorrect. But the thought exercise is still useful as a measure of antitrust risk on the assumption of equal enforcement efficiency across regimes. In addition, it suggests that an accurate measure of antitrust risk could be determined by decomposing risk into a legal component, based on the scope of the



country's laws, and an enforcement component, based on the zeal with which local enforcers pursue violators.

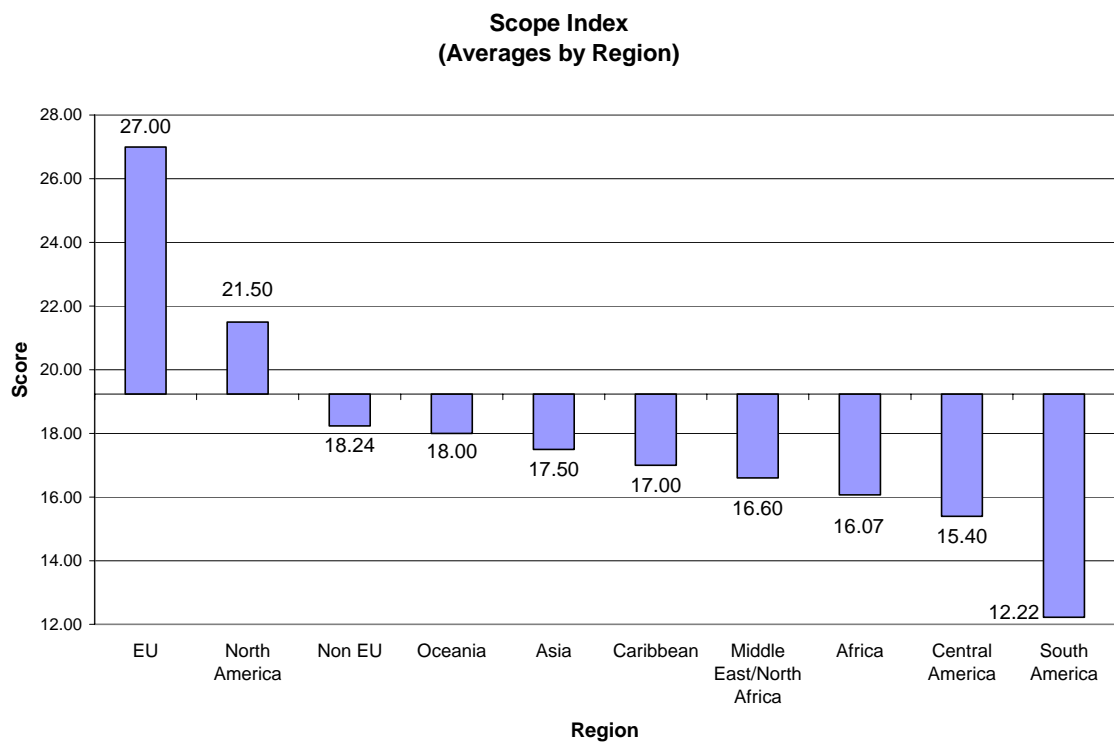


Figure 5: Scope Index by Region (EU law)

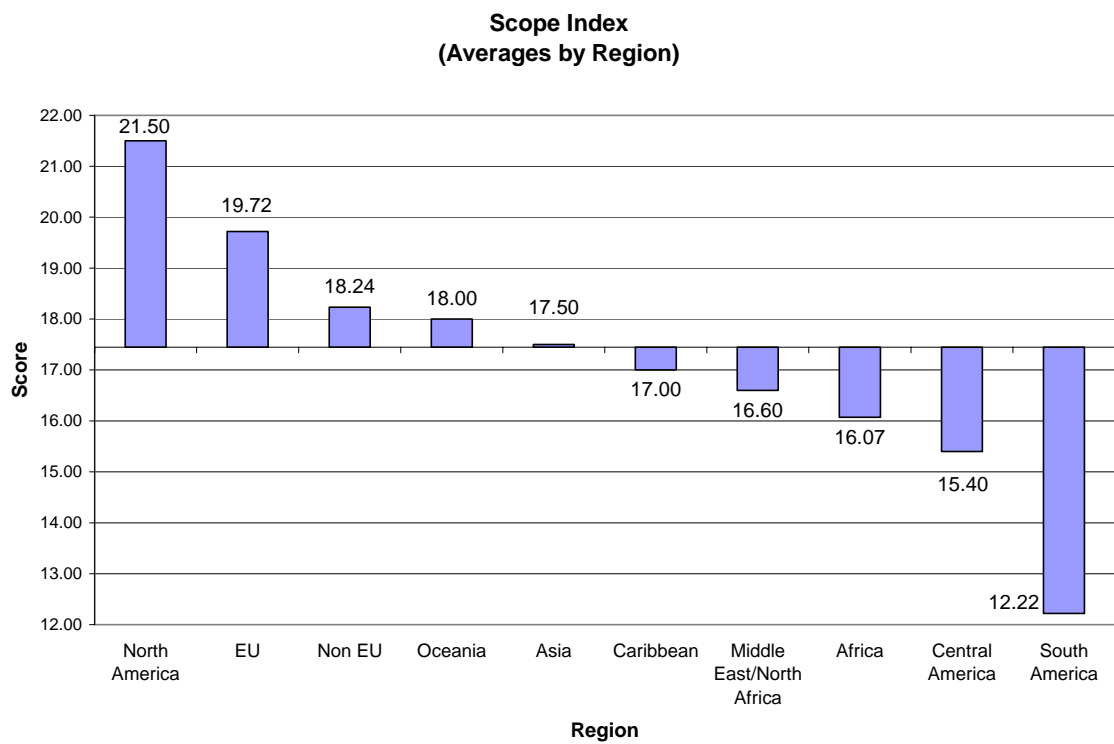


Figure 6: Scope Index by Region (national laws)

## 2. Dominance Scores

We turn our attention now to dominance law – or, in the language of American antitrust specialists, monopolization law. The Dominance score is an attempt to measure the number of types of conduct specified in a country’s competition law as unlawful abuse of a dominant position. For those familiar with American law, the dominance measure is an attempt to measure the scope of laws equivalent to Section 2 of the Sherman Act. One can think of the Dominance score as the size of the net specifically designed to capture dominant firms that engage in anticompetitive conduct.<sup>25</sup>

Figures 7 and 8 present the Dominance scores. Again, the EU and North America are the leading regions. The EU leads if EU law is used rather than the national competition statutes (Figure 7), and North America leads if national competition statutes are used to assess the scope of dominance law (Figure 8). Of course, the lead enjoyed by the EU law is quite substantial: the dominance score for the EU, based on EU law, is 33 percent larger than that for North America. When national competition statutes are used to assess the scope of dominance law, North America is only slightly ahead of the EU.

The weakest regimes in terms of dominance law are Africa, Central America, and South America. South America and Central America remain the two weakest regimes, as they appeared in the comparison of Scope Indexes (see Figures 5 and 6). However, whereas South America was the weakest region in terms of overall scope, Central America is the weakest in terms of dominance law.

The comparison based on national statutes indicates that most countries are either considerably above or considerably below the average (Figure 8), which is represented by the Middle East/North Africa (Algeria, Israel, Morocco, Jordan, Tunisia). Africa, consistent with our earlier description of the Scope Index, is among the weak regimes, but is stronger than Central America and South America. This is a bit surprising because one would think that attempting to control monopolies would be a low priority in relatively underdeveloped countries; and Africa, especially sub-Saharan, is unambiguously less developed than either the Central America or South America regions.

Table 1 shows the “average country GDP per capita” in 2005 (in U.S. dollars) in the regions used for this study, where this average is computed by averaging the GDPs of the countries within a regional category. For example, the \$37,900 figure for North America represents the average of the GDP per capita for Canada and that for the U.S. Since all of the countries used to complete the table have competition laws, the GDP per capita figures are in many cases higher than what would appear if we took the average of the per capita GDPs for all of the countries in each region. Comparing Table 1 to Figure 8, one observes that except for the case of Africa, there is a roughly monotonic relationship between regional “average country GDP” and the scope of regional dominance law.

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<sup>25</sup> The Dominance scores were computed by summing all of the points in each country’s template for the various types of conduct that are prohibited under the dominance section. For example, in the case of New Zealand (Table A1), the Dominance score is 4.

Africa stands out as having a much broader set of laws than one would predict on the basis of regional income tables.

North America	\$37,900
EU	\$25,804
Oceania	\$19,900
Non-EU	\$12,694
Middle East	\$9,800
Caribbean	\$9,466
South America	\$7,788
Asia	\$7,627
Central America	\$7,540
Africa	\$3,385

Table 1: Average Country GDP by Region, 2005  
(among countries with a competition statute).

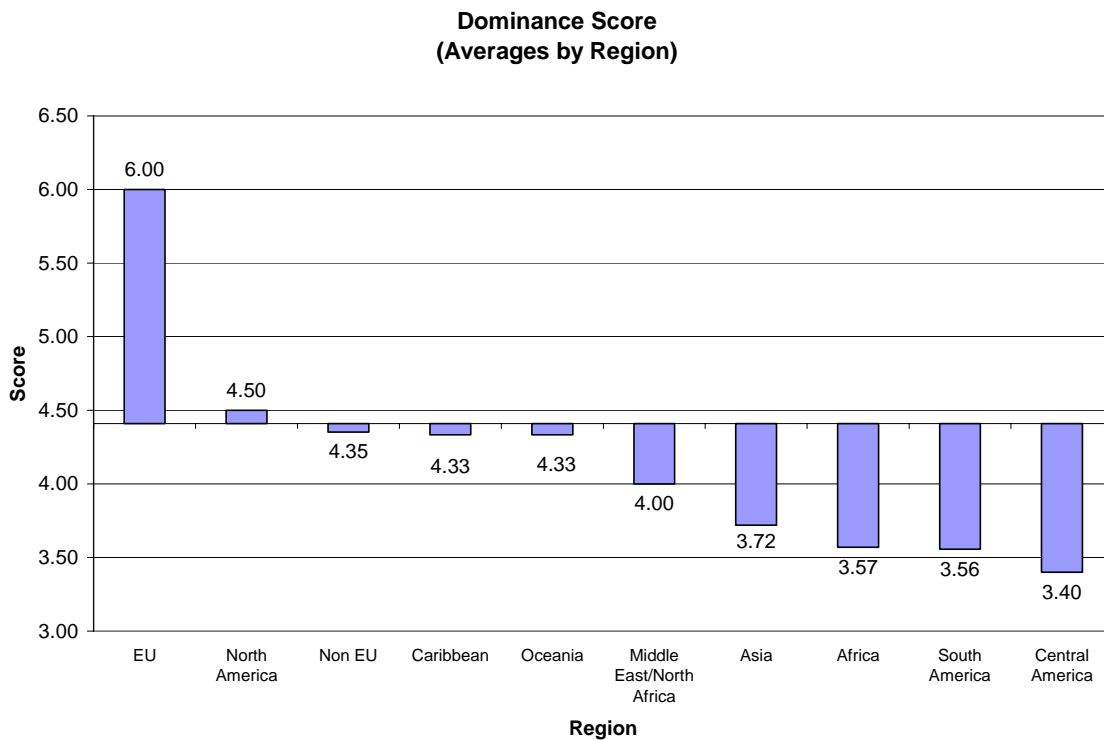


Figure 7: Dominance Score (EU Law)

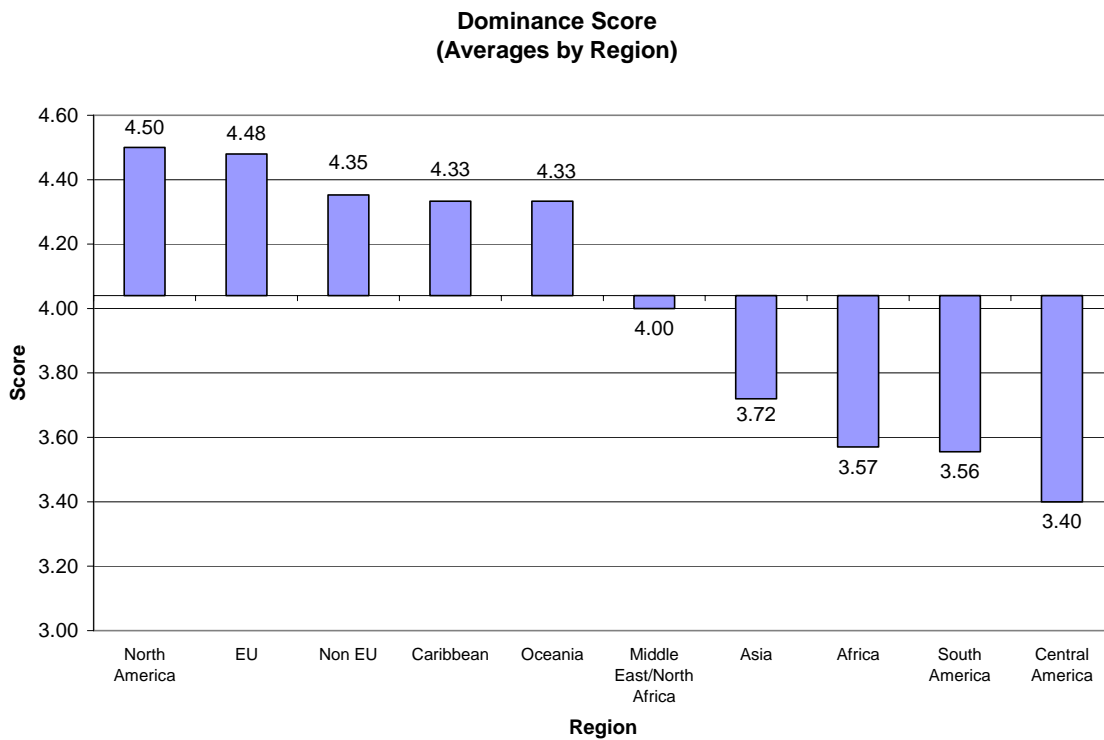


Figure 8: Dominance Score (national laws)

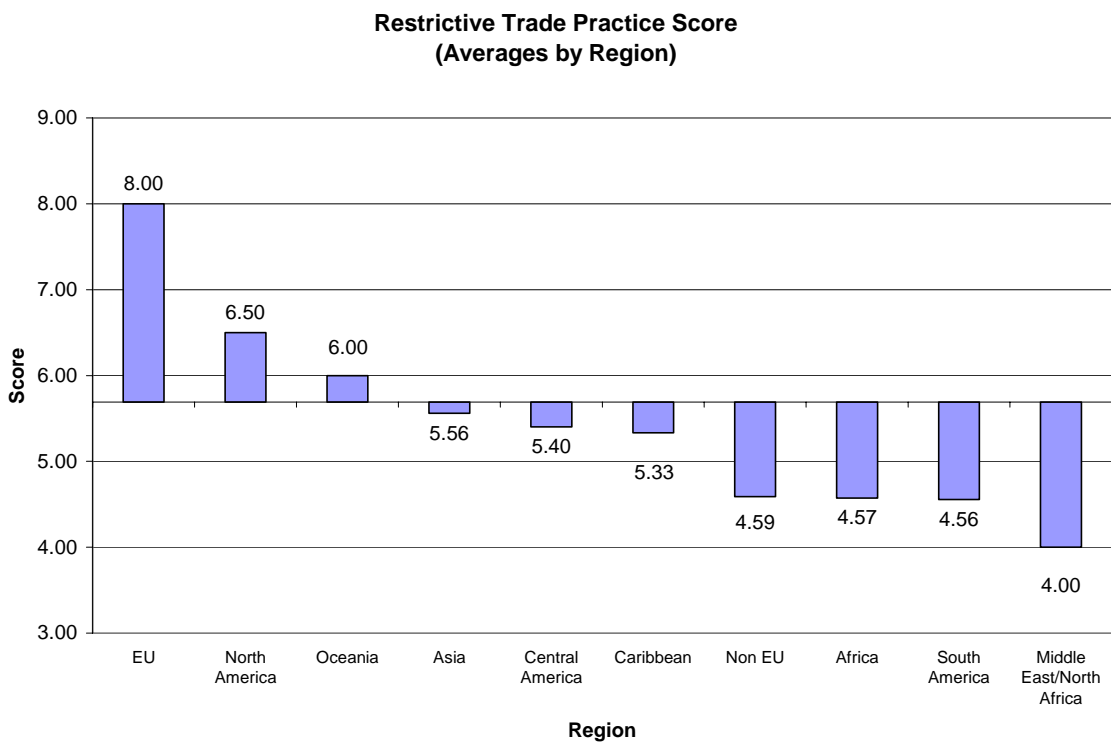


Figure 9: Restrictive Trade Practices (EU law)

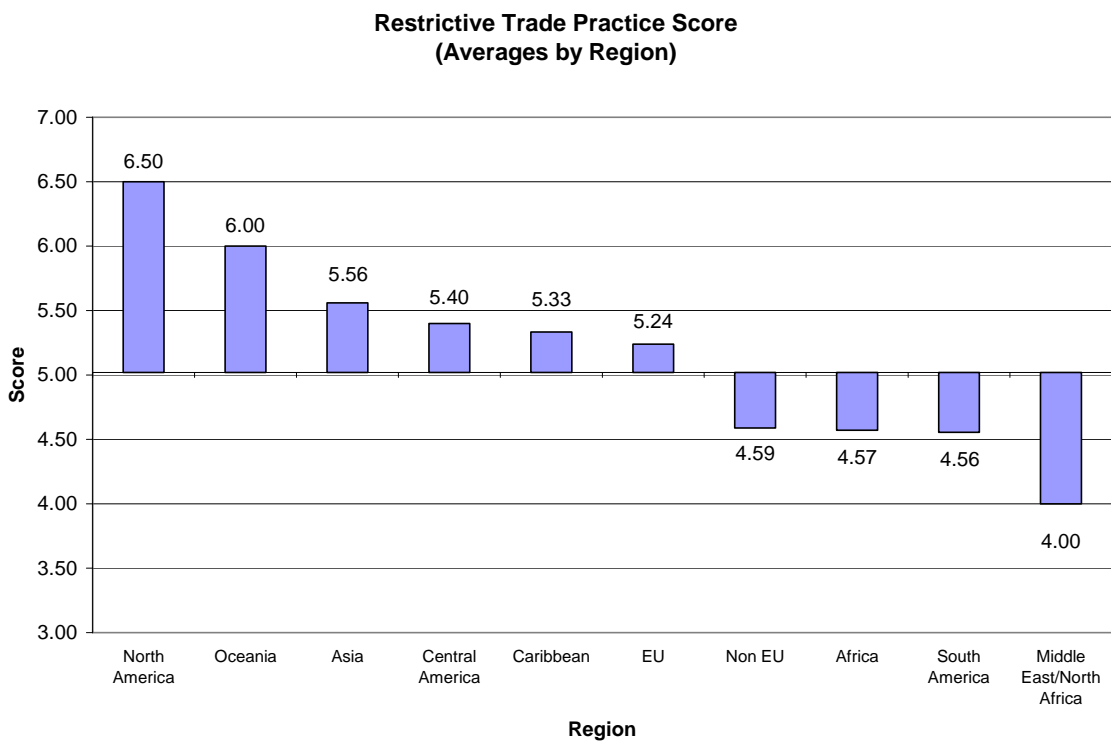


Figure 10: Restrictive Trade Practices Score (national laws)

### 3. Restrictive Trade Practices

Restrictive Trade Practices refers to collusive conduct and agreements that restrain trade – conduct that would fall under Section 1 of the Sherman Act. Figures 9 and 10 examine the scope of laws governing restrictive trade practices by region. The Restricted Trade Practices score measures the size of the net designed specifically to catch firms that engage in collusive anticompetitive conduct or enter into contracts that restrain trade.

The first observation suggested by Figures 9 and 10 concerns the EU region. When using EU law as the source of European competition law, the EU comes out in the lead on restrictive trade practices law (Figure 9). When using national laws as the source of European competition law, the EU region lands in the middle of competition law regimes (Figure 10). This is a clear illustration of the dual competition law regime that exists in the EU. Since the national statutes are weaker with respect to restrictive trade practices, the rate of collusive activity among small firms that fall under the jurisdiction of national competition laws should be substantially larger than the rate of collusive activity among big firms in the EU. Moreover, it implies that a group of big firms contemplating collusive conduct in the EU would be well advised to carry out their plan through small intermediaries, thus opting for a more lenient legal regime.

Both Figures 9 and 10 show that outside of the EU region, the top regimes are North America followed by Oceania, whose position is largely based on the cartel laws of Australia and New Zealand. Asia is third, reflecting the extensive prohibitions in South Korea, India, and Taiwan. Central America is fourth, which is surprising in view of its generally weak competition laws. The explanation for the unusually strong showing for Central America is that of the five countries we put in this category (Mexico, Panama, Costa Rica, Guatemala, El Salvador), two of them (Mexico and Panama) have the highest scores possible on cartel practices. In addition, although Costa Rica's cartel laws are far from the strictest, they are stricter than average. Thus, although Central America is a weak region overall in terms of competition law, it is relatively strong on cartel practices.<sup>26</sup>

One empirical question immediately suggested is whether countries with competition laws focused primarily on cartel practices perform better in economic terms than other countries. Dominance law has been an uncertain and controversial affair, at least if judged by the U.S. experience. Judge Posner, relatively early in his career as a scholar, suggested that the uncertainties of dominance law were so daunting that Section 2 of the Sherman Act should be repealed.<sup>27</sup> And it has been a well known if not openly acknowledged policy of Republican administrations since Reagan to shift antitrust enforcement toward cartel practices and away from unilateral conduct by dominant firms. The variation in international laws may permit researchers to determine whether the evidence on economic performance would support such a shift.

<sup>26</sup> Some commentators have urged precisely this policy for developing countries, and especially Latin America. See Malcolm B. Coate et al., *Antitrust in Latin America: Regulating Government and Business*, 24 U. MIAMI INTER-AM. L. REV. 37, 81 (1992).

<sup>27</sup> RICHARD A. POSNER, *ANTITRUST LAW: AN ECONOMIC PERSPECTIVE* 214-216 (1976).

The weakest regions in terms of cartel regulation are Africa, South America, and Middle East/North Africa. Non-EU Europe is relatively weak, with a restrictive trade practices score that is roughly similar to that of Africa. Asia has stronger cartel laws than Non-EU Europe.

In the area of cartel regulation there is a substantial difference between EU and non-EU Europe, whether one looks at EU law or the national statutes. Based on EU law, the EU region's cartel net is roughly 75 percent larger than that of non-EU Europe. Based on national statutes, the difference is 13 percent. Non-EU Europe includes several countries from southeastern Europe and some former Communist regimes. As relatively poor countries, they have not devoted significant resources to competition law. The puzzle is why this difference would be most apparent with respect to cartel regulation, and not in the area of dominance law.

#### 4. Merger Law

The Merger Score attempts to measure the size of the competition law net applied to mergers. It is the sum of the scores for two parts of each country's merger law; the part governing merger notification requirements, and the part governing the assessment of mergers. It excludes points assigned to defenses, such as efficiency or public-interest defenses. The countries with mandatory-premerger notification requirements tend to have the highest merger scores.

Most of the Merger Scores follow expected patterns. The EU region is the most restrictive regime, based on EU law, and third in rank on the basis of national statutes. The score for the EU region based on EU law is 7, while the score for the EU region based on national statutes is 5.8, a relatively small difference in scores. This reflects the fact that many EU nations already have mandatory premerger notification regimes. EU law does not introduce significant burdens for big firms that would not be faced under the national statutes.

Surprisingly, Middle East/North Africa is the second strongest regime on merger law. The reason for this strong showing is that among the countries in this category – Algeria, Israel, Morocco, Jordan, and Tunisia – all except Tunisia have mandatory-premerger notification regimes. North America is third in rank.

South America appears, again, as the weakest regime. This is because mandatory-premerger notification regimes are relatively rare in South America. Of the nine countries in this category (Bolivia, Chile, Paraguay, Peru, Uruguay, Venezuela, Argentina, Columbia, Brazil), only two (Argentina and Columbia) have mandatory-premerger notification requirements. Six of the nine (Bolivia, Chile, Paraguay, Peru, Uruguay, and Venezuela) have no merger notification requirements at all.

Africa is among the weaker regimes, but it is the strongest of the relatively weak merger law regimes. Merger law in Africa is more demanding than that on average in Asia,



Oceania, Central America, Caribbean, and South America. Again, this is a bit of anomaly given that merger control is an activity that one would assume to be on the low end of priorities for developing countries. Africa's merger score may reflect a tendency, viewed critically by development economists such as P.T. Bauer, for African countries to adopt relatively interventionist laws in comparison to other countries at comparable stages of economic development. In Bauer's view this tendency was an important obstacle to Africa's development.<sup>28</sup>

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<sup>28</sup> P.T. BAUER, REALITY AND RHETORIC: STUDIES IN THE ECONOMICS OF DEVELOPMENT 27- 35 (1984). More recently, the risk that interventionist laws could retard development has been raised in the context of competition laws adopted by transition economies. See Paul E. Godek, *A Chicago-School Approach to Antitrust in Developing Nations*, 43 ANTITRUST BULLETIN 261 (1992); William E. Kovacic, *Institutional Foundations for Economic Legal Reform in Transition Economies: The Case of Competition Policy and Antitrust Enforcement*, 77 CHI.-KENT L. REV. 276 (2001); Armando E. Rodriguez & Malcolm B. Coate, *Limits to Antitrust Policy for Reforming Economies*, 18 HOUS. J. INT'L L. 311 (1996).

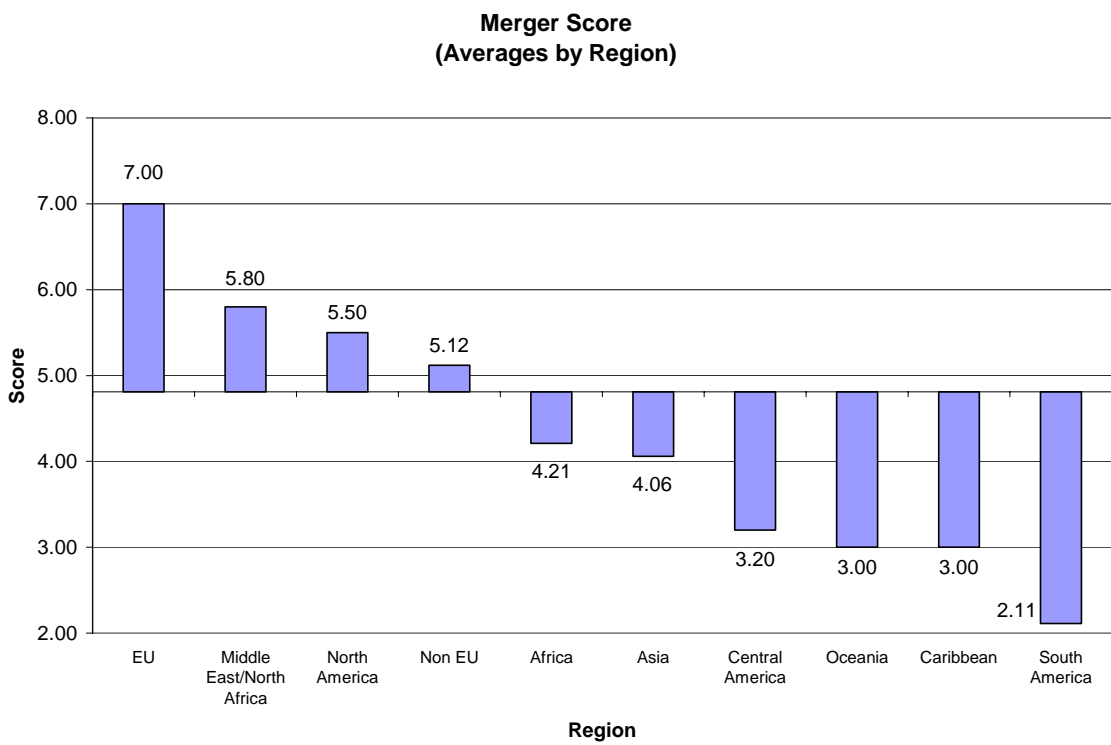


Figure 11: Merger Score (EU law)

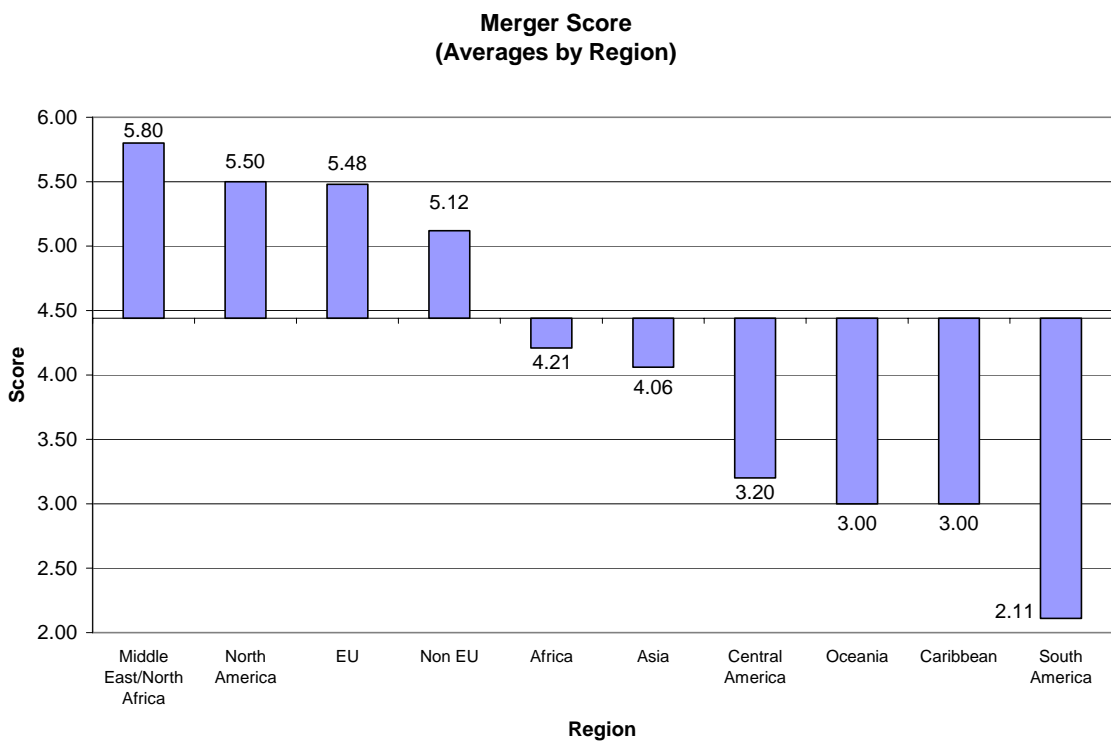


Figure 12: Merger Score (national laws)

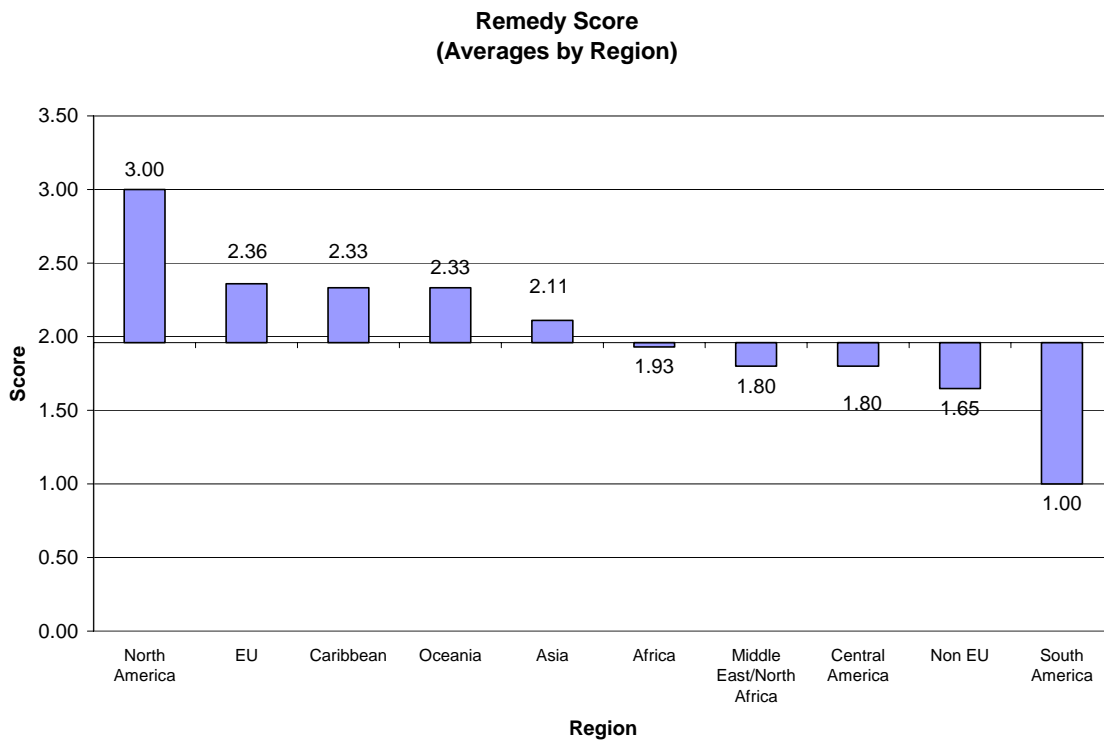


Figure 13: Remedy Score (EU law)

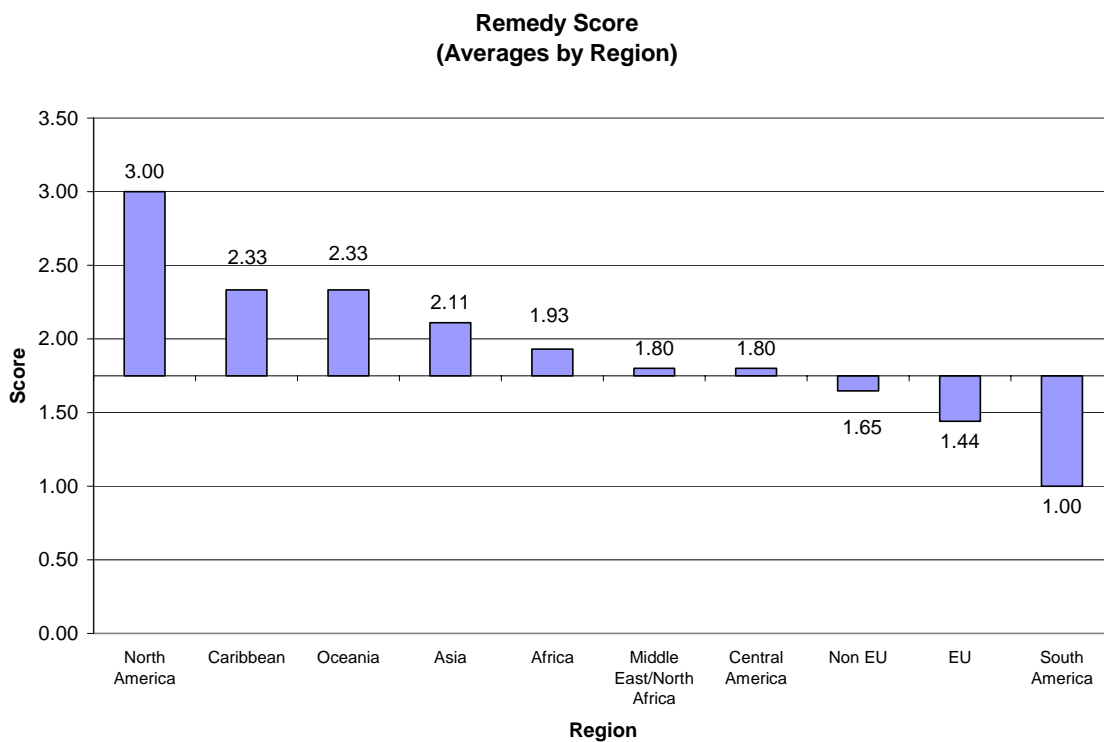


Figure 14: Remedy Score (national laws)

## 5. Remedies

In addition to substantive law, competition law regimes can be ranked in terms of the penalties applied to firms. The Remedy Score, shown in Figures 13 and 14, is an index measuring the range of punishments available to competition law enforcement authorities. Three types of punishment are considered here: fines, prison sentences, and divestiture orders. The highest score that a country can get is 3, the lowest is obviously 0.

North America is the strongest regime with an average of 3. South America is the weakest regime with an average of 1. The world average is represented by Central American and Middle East/North Africa, with scores of 1.8.

The dual system of EU law is evident in Figures 13 and 14. When EU law is taken into account, the EU region is second in rank following North America. When national laws are consulted, the EU region is one of the weakest regimes. Clearly, this implies that the rate of competition law violations should be considerably higher among smaller firms in the EU that escape the jurisdiction of the European Commission.

Even if we evaluate the EU region on the basis of EU law rather than the national statutes, it is arguably further behind North America than is suggested by the Remedy Scores. The reason is that the EU does not provide for prison sentences. The only reason the EU score is above 2 in Figure 13 is because some of the member states have statutes that provide for prison sentences, and EU law allows for the penalty applied under a more rigorous national statute to be applied.

Prison sentences are probably frightening to executives of large firms. They present a risk that a highly-compensated officer will lose his income for a period of years, and find it difficult to be reintegrated into the business world after his release. Given this, the difference between EU and North American law should be viewed as quite significant.

## 6. Efficiency Defenses

To this point we have considered regional comparisons of prohibitions and penalties set out in competition laws. Now we consider efficiency defenses. Efficiency defenses appear in the laws governing merger assessment, restrictive trade practices, and dominance. The three sets of efficiency defenses are grouped together in Figures 15 – 20.

Some patterns can be discerned. The regional patterns suggest that the countries that offer efficiency defenses as part of dominance law also offer efficiency defenses as part of their merger laws. North America is most generous in its efficiency defenses, both in merger law and in dominance law. The EU on the other hand is stingy, at least in comparison to North America. In terms of EU law, the EU region does offer an efficiency defense for mergers. However, in terms of national laws, the EU is relatively stingy in offering efficiency defenses for dominant firms and for merging firms. Indeed, the stinginess with respect to efficiency defenses appears to be a pan-European trait: non-EU Europe is also stingy in offering such defenses for merging and for dominant firms.

It makes intuitive sense that the countries that are willing to consider efficiency defenses in actions against dominant firms will also consider such defenses in merger disputes. The issues are similar. In the United States, Sherman Act Section 2, which governs dominant firms, and Clayton Act Section 7, which governs mergers, could both be used by a litigant in an attempt to prevent or reverse a merger. Given the similar concerns in dominance and merger law, it would appear strange for a competition authority to take efficiency defenses into account in one area and not in the other. Most countries appear to follow a consistent pattern of being relatively generous or relatively stingy in efficiency defenses for both parts of the law. The one unusual case is Asia, which is relatively generous in efficiency defenses for merger cases and relatively stingy in efficiency defenses for dominant firms.

The consistent patterns that one should expect to observe in dominance and merger law should not necessarily appear in restrictive trade practices law. A legal system might provide several efficiency defenses for dominant firms without providing the same number for cartels, as the U.S. law illustrates. Indeed the standard argument in the U.S. for offering fewer efficiency defenses for restrictive trade practices is that they tend as a class to be more consistently harmful to economic welfare. Given this, it is reasonable to infer, in the absence of strong countervailing evidence, that a cartel does not have an efficiency basis; and given this inference, it may be efficient to limit the scope for efficiency defenses in cartel cases.

North America and Oceania are the most generous in terms of efficiency defenses for cartel practices, with EU Europe closely behind. South America is by far the least generous in terms of efficiency defenses for cartel practices.

One might argue that the result for South America is simply an artifact of the earlier data on prohibitions. If a region is relatively weak in prohibitions, then it should obviously be

weak in terms of defenses to those prohibitions. The problem with this argument is that a weak law with no defenses can still pose substantial risks to potential defendants, especially if the prohibitive part of the law is general in character. A very limited set of general prohibitions coupled with few or no defenses could easily put potential defendants in a position in which they are unable to predict whether a given course of conduct violates the law. Such a regime gives a worrisome degree of discretion to enforcement authorities. A risk-averse potential defendant might prefer to conduct business in a regime with more prohibitions coupled with a larger set of defenses.

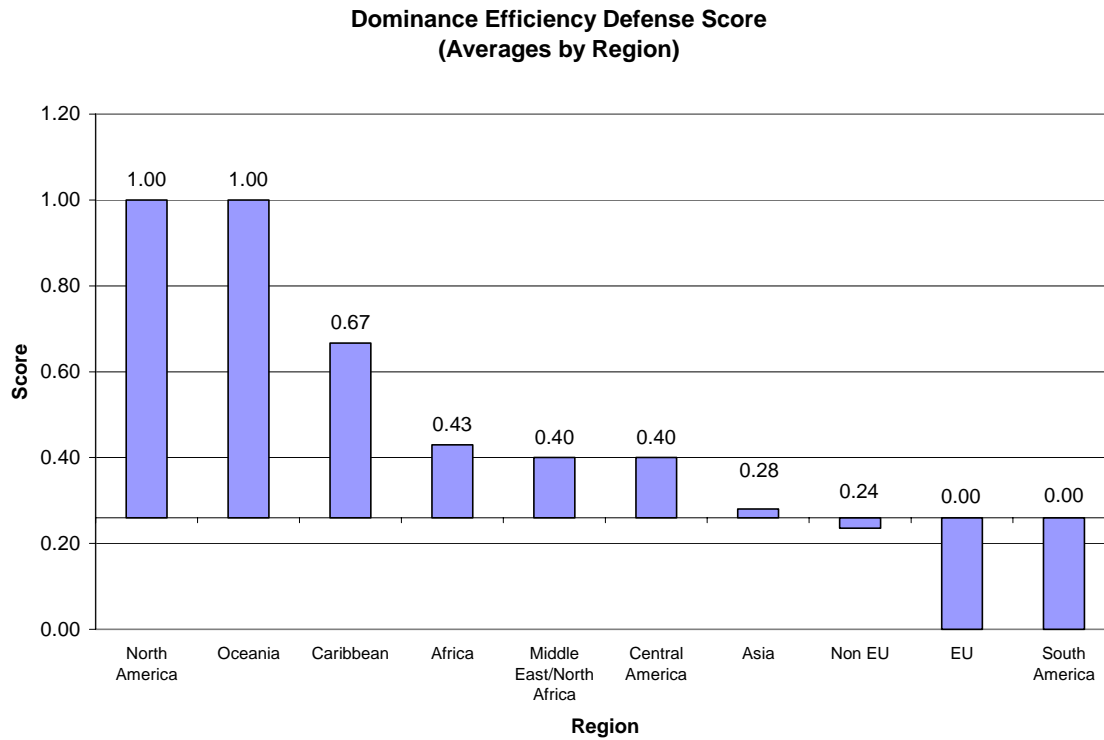


Figure 15: Dominance Efficiency Defense (EU law)

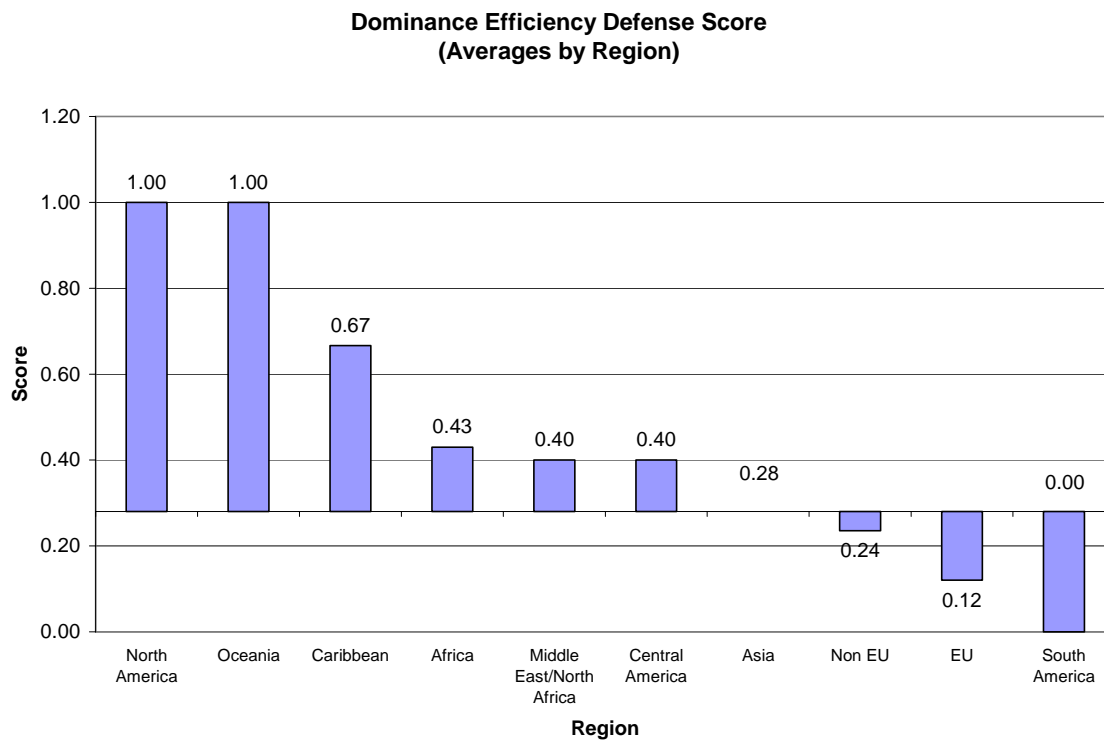


Figure 16: Dominance Efficiency Defense (national laws)

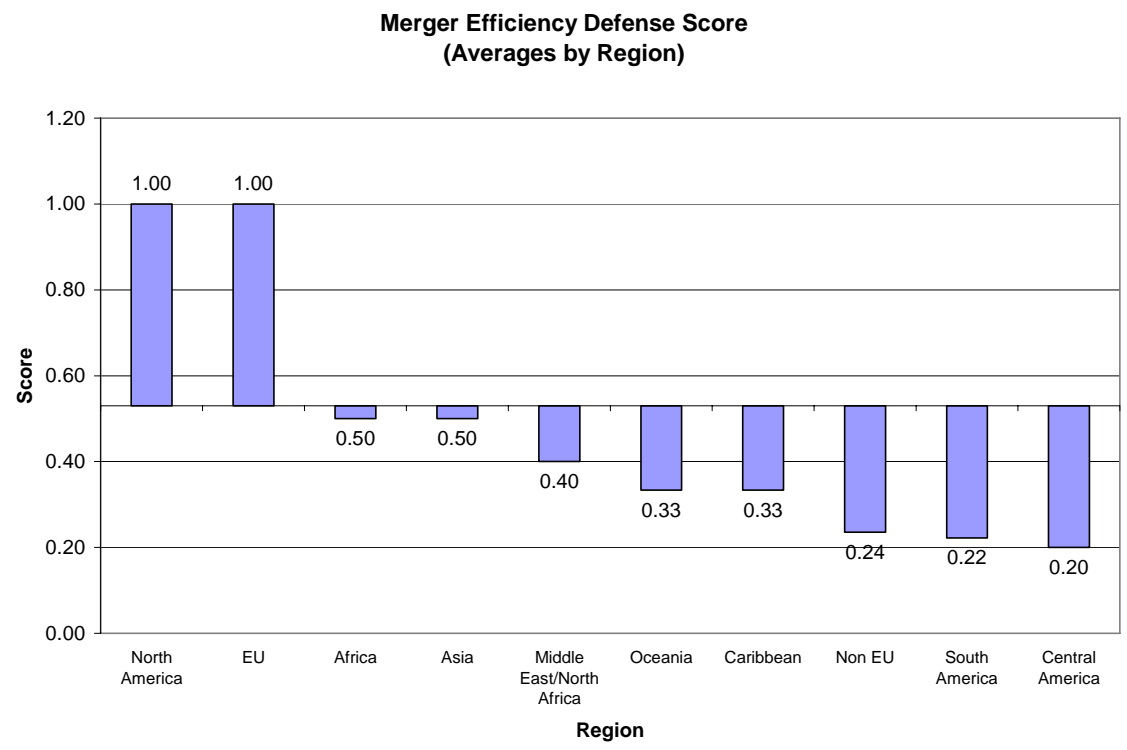


Figure 17: Merger Efficiency Defense (EU law)

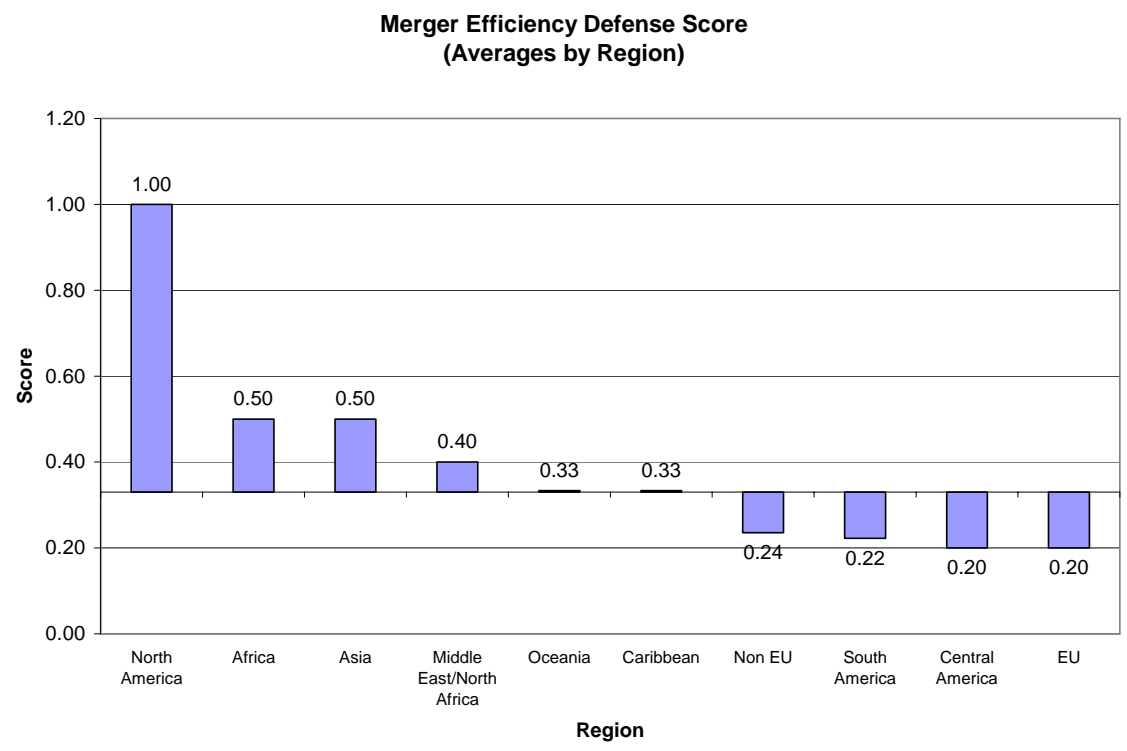


Figure 18: Merger Efficiency Defense (national laws)



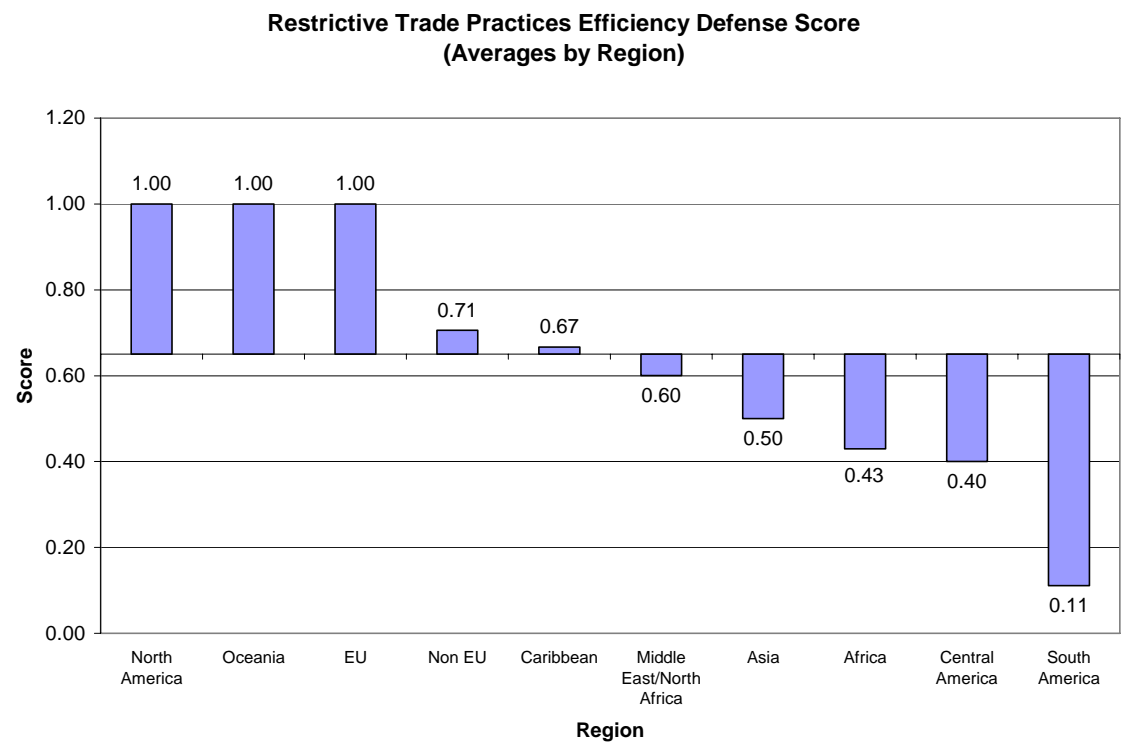


Figure 19: Restrictive Trade Practices Efficiency Defense (EU law)

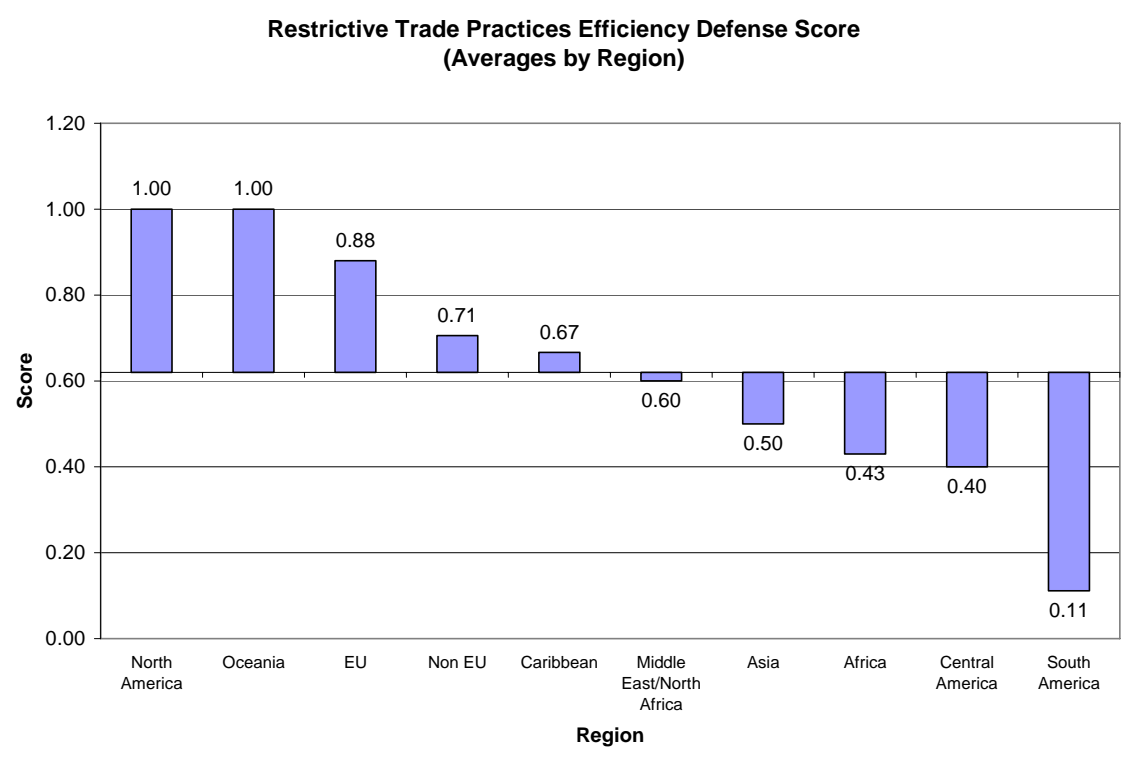


Figure 20: Restrictive Trade Practices Efficiency Defense (national laws)

#### IV. Empirical Analysis

Does the presence of a competition law have an impact on the competitiveness of a nation's economy? One way to answer this question is to use regression analysis to see if the presence of a competition law appears to have a statistically significant impact on some measure of competitiveness. Several recent studies have done this,<sup>29</sup> using a dummy variable that indicates whether or not the country has a competition law.

The information we have coded on competition law regimes provides a richer measure of competition law. While previous studies have used a single dummy variable to indicate the presence of a competition statute, the Scope Index allows us to use a quantitative measure of the law that tracks the restrictiveness of a country's competition statute. In other words, while previous studies have used a variable that indicates whether there is a competition law net in a country, our data permit us to use a variable that indicates the size of the competition law net.

The basic regression model in this study assumes that the intensity of competition in a nation's economy is influenced by the scope of that nation's competition law. In other words, if the variable  $CI$  represents a proxy for the competition intensity of an economy, and  $SI$  is the Scope Index, the basic model assumes  $CI = f(SI, X_1, X_2, \dots, X_N)$ , where  $X_1, \dots, X_N$  represent other factors that influence competitiveness.

##### A. Theoretical background

To many economists the Lerner index,<sup>30</sup> which measures the percentage mark-up of the firm's price over marginal cost at the profit-maximizing production level, provides a desirable theoretical measure of a firm's market power. For this reason, it also serves as an index of the competitive intensity of the market in which the firm operates. If the firm faces few competitors, it will be relatively unconstrained by competition and will charge a price that is close to the monopoly price. On the other hand, if the firm faces many competitive constraints it will be forced to charge a price that is close to marginal cost. In the standard monopoly model, the Lerner index is

$$L = \frac{p - mc}{p} = \frac{1}{\varepsilon_d},$$

where  $p$  represents price and  $mc$  represents marginal cost (at the profit maximizing level of output) and  $\varepsilon_d$  is the elasticity of demand for the firm's product.

An alternative to the standard monopoly model is the Cournot model of competition, which examines the profit-maximizing output choices of firms when they face

<sup>29</sup> See Mikyung Yun et al., *Competition, Competitiveness and Development: Lessons from Developing Countries*, UNITED NATIONS CONFERENCE ON DEVELOPMENT AND TRADE 259-330 (2005) (available [http://www.unctad.org/en/docs/ditclp20041\\_en.pdf](http://www.unctad.org/en/docs/ditclp20041_en.pdf)); Krakowicz, *supra* note 4.

<sup>30</sup> Abba P. Lerner, *The Concept of Monopoly and the Measurement of Monopoly Power*, 1 REV. ECON. STUD. 157, 157-75 (1934).

competition from rivals. The Cournot model is mathematically more complicated than the standard monopoly model. However, for our purposes, the model's implications for the Lerner index are all that is necessary. Suppose there are  $N$  firms and that the inverse demand curve for the good produced by those firms is  $p = a - bQ$ , where  $Q$  is the sum of the output levels of the  $N$  firms (i.e.,  $Q = q_1 + \dots + q_N$ ). Suppose, in addition, each firm produces with a simple cost function  $C = cq_i$ ,  $i = 1, \dots, N$ . In this version of the Cournot model with  $N$  firms, the price-cost mark-up for a given firm is<sup>31</sup>

$$\frac{p - mc}{p} = \frac{a - c}{a + Nc}.$$

Treating the price-cost markup as a proxy for competition intensity, this equation suggests that competition intensity is determined by the factors that influence: (1) the level of aggregate demand (represented by the demand shift parameter  $a$ ), (2) production costs ( $c$ ), and (3) the number of firms serving the market ( $N$ ).

The empirical analysis conducted below takes the competition intensity equation (1) as the theoretical foundation for the regression models employed. The model specifications reflect our attempts to use variables that influence aggregate demand, production costs, or the number of firms serving the market. The one additional factor that we introduce into the model is the law. The Scope Index measure is included as an explanatory variable, on the theory that competition intensity should increase as the scope of the competition law expands.

Using the Cournot framework as the starting point, the basic regression model will therefore have the following form

$$CI = \beta_1 SI + \beta_2 a + \beta_3 c + \beta_4 N.$$

$CI$ , the dependent variable, is a proxy for the intensity of competition in a nation's economy. The variable  $SI$  is the Scope Index. If we assume that  $CI$  increases with the intensity of competition, then any variable that causes the market to become more competitive likely reduces the price-cost markup, and increases  $CI$ . If an increase in the scope of a nation's competition law leads to a more competitive economy, the estimated value of  $\beta_1$  will be positive in our regressions. The Cournot model implies  $\beta_2$  is positive,  $\beta_3$  is negative, and  $\beta_4$  is negative.

The intensity of competition within a country cannot be observed or measured directly. Given this, we will use survey and other measures as proxies. Since the aggregate demand shift parameter  $a$  and the cost parameter  $c$  cannot be directly observed, we will use variables that proxy for them. In addition, we will use variables that impact entry, exit, and foreign competition to account for the number of firms serving the market.

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<sup>31</sup> See, e.g., MICHAEL D. INTRILIGATOR, MATHEMATICAL OPTIMIZATION AND ECONOMIC THEORY 207-209 (1971).

Because the Cournot model parameters cannot be observed directly, and will therefore have to be represented, in a sense, by variables that influence them, it will not be straightforward to derive the implications of the Cournot model for the signs of the regression coefficients. To take an example, suppose we use GDP per capita as a variable that influences the demand shift parameter  $a$ . GDP per capita also influences the number of firms that will enter, since a wealthier economy will attract more sellers of goods. Thus, the impact of GDP per capita in a regression analysis will reflect countervailing influences: increasing prices by lifting demand and reducing prices by encouraging entry of firms. Because of these countervailing effects, we make no effort to predict the signs of regression coefficients for the variables that we use to proxy for the Cournot model parameters.

## B. Basic Model

The simplest regression model, which we examine in this part, treats the scope of a nation's competition law as if it were independent of the intensity of competition in the nation's economy. In other words, causation is assumed to run only one way: from the law to the intensity of competition. The model assumes that increasing the scope of the law causes competition among firms in the economy to become more intense. The reason this is assumed to occur is because a broader set of competition laws restrains conduct with anticompetitive effects (e.g., collusion, monopolization, mergers toward monopoly). Of course, as we discuss later, this assumption of one-way causation may be incorrect.

Results for the basic model appear in Tables 2 through 5. We used two variables as proxies for the notional dependent variable, the intensity of competition. One is a survey measure of the intensity of local competition, compiled by the World Economic Forum. The intensity of competition survey measure runs from 1 (not intense) to 7 (intense). Because of the subjective nature of this measure, we will sometimes refer to it as the perceived intensity of competition. The other proxy is the Purchasing Power Parity index, which we use below as an objective measure of the intensity of competition.

The key independent variables are the Scope Index (based on national competition codes), GDP per capita, the log of population, the average wage in the manufacturing sector, government spending as a percentage of GDP, the competition enforcement budget as a percentage of GDP, and the number of years that the nation has had a competition law. The table also includes dummy variables that indicate whether the country has a competition agency. Finally, we have included dummy variables indicating the region of the country.

As noted, we have used the Scope Index based on national competition statutes. This matters only in the case of EU Europe, because EU Europe is a much stronger regime if the law is coded on the basis of the EU provisions. However, the national statutes offer richer variation in the Scope Index measure, and provide at least a minimal and arguably more accurate measure of the scope of the competition law in a particular EU country.

## 1. Subjective Measure of Competition Intensity as Dependent Variable

### Competition Law Effect

The most important variable in this study is the Scope Index, our measure of the size of the competition law net. Our first tables of results, Tables 2 and 3, present regression results using the World Economic Forum's survey measure of the intensity of competition in a nation's economy in the years 2003 and 2004 respectively.

Although far from conclusive, there is evidence in Tables 2 and 3 that the size of the competition law net is associated with greater intensity of competition – at least as reflected in the World Economic Forum's survey measure. In the first column of Table 2 the regression coefficient for the Scope Index is .02 and is statistically significant. The remaining columns of Table 2 report estimates from a high of .028 to a low of .014. The estimates for 2003 suggest that for every one point increase in the Scope Index, the Competition Intensity survey measure increases by nearly .02. The results in Table 3, for the year 2004, are also consistent with an estimate of roughly .02 for the impact of the Scope Index.

To consider a concrete example of the implications of these results, take the case of Peru, which has a Scope Index of 13 and a Competition Intensity measure of 4.7 for 2003. Although as a general rule regression results should be considered useful only for small extrapolations, let us consider a relatively large extrapolation, recognizing that the answer is most likely an overstatement. Suppose Peru were to revamp its competition statute, so that the Scope Index increases by 5 points to a new score of 18. The results of Table 1 suggest that the maximum increase in the Competition Intensity measure that would result is 0.1. In other words, a 5 point increase in the Scope Index could increase the Competition Intensity measure from 4.7 to 4.8.

In terms of statistical significance, the results of Tables 2 and 3 are mixed, though largely supportive of the claim that the scope of a nation's competition law is positively associated with the intensity of competition in its economy. Of course, there is also the question of economic significance. Even if we view the results as indicating a statistically significant marginal impact of .02 for the Scope Index, this may fall below what some observers would consider an economically significant impact. Return to the example of Peru. Suppose, somewhat fantastically, Peru were to overhaul its competition laws to raise the Scope Index from 13 to one of the highest scores possible, 28. Such a large increase in the scope of Peru's competition laws would, these results suggest, increase Peru's Competition Intensity measure in 2003 from 4.7 to 5. This is of course a substantial increase, given that the Competition Intensity measure runs from 1 to 7. But in terms of its overall rank among competitive economies, Peru would remain far below the most intensively competitive economies (e.g., U.S., Hong Kong, Germany, United Kingdom).<sup>32</sup>

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<sup>32</sup> Specifically, Peru would move from 46<sup>th</sup> place to 36<sup>th</sup> place based on the 2003 WEF's competition intensity survey results.

In addition to our measure for the scope of the competition laws, we have also included a variable measuring the number of years the competition law has been effect (in some form),<sup>33</sup> a variable measuring the competition law enforcement budget as a percentage of GDP, and a dummy variable indicating the existence of a competition law enforcement agency.

The point of the Age of Competition Law variable is to capture the extent to which a culture of enforcement may have developed. A nation that has had a competition law for 100 years is likely to have a different view toward enforcement than a nation that has had a competition law for only 5 years. Although Table 2 shows no significant effect for the age of the law, Table 3 suggests that there may be a significant impact. The larger estimates suggest that each year the law has been in effect increases the competition intensity survey measure by as much as .01. Taking the larger estimate as an upper bound, this suggests that it would take quite a long time, perhaps a century or more, for a competition law to move a country up one digit (on the scale of 1 to 7) in the survey measure of competition intensity.<sup>34</sup>

The variable measuring enforcement budget relative to GDP was included in order to see whether countries that spend more on competition, relative to the size of the economy, have better results in terms of the intensity of competition. Because we have so few observations on budgets, the results are weak (see Table 2, column 5). We have no evidence of the competition enforcement budget having a significant impact on perceived competitive intensity.

Our variable indicating the existence of a competition law enforcement agency also fails to show a substantial impact, except for the last column of Table 2. However, because it is correlated with the Scope Index, it appears to have robbed the Scope Index of some its explanatory power. Introducing the agency dummy causes the scope measure to fall in value and in statistical significance.

### Other Variables

In addition to measures of competition law, such as the scope of the competition statute and its age, several other variables used in the regressions in Tables 2 and 3 have statistically significant effects on perceived competitive intensity. GDP per capita, is positive and statistically significant in each regression. In particular, each \$1000 increase in GDP per capita increases the survey measure of competition intensity by roughly .02.

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<sup>33</sup> As the American experience suggests, a competition law may have been in effect for many years, and yet the law may have changed substantially over that period. Competition laws in particular are almost always in a process of revision. The *Age of Competition Law* variable in our regressions measures the age of the statute from the enactment date of its key parts. For example, the U.S. competition law's age is measured from the enactment year of the Sherman Act, 15 U.S.C. §2 (2000), (1890). No effort has been made to incorporate significant changes, such as the enactment of additional legislation (e.g., the Clayton Act, 15 U.S.C. §19 (2000), in the U.S. in 1914).

<sup>34</sup> See Krakowski, *supra* note 4, which discusses learning curve effects. If learning effects dampen as the time increases, then the marginal impact of an additional year after having a law for 10 years is smaller than that of the additional year after having a law for five years.

Recall that the Cournot competition model introduced at the start of this discussion pointed to three determinants of competition intensity: the demand shift parameter, the cost parameter, and the number of firms. GDP per capita probably impacts at least two of these parameters, since a wealthier economy will attract more firms and also generate a greater demand for goods. The positive estimate for GDP per capita suggests that the market expanding effect of increasing national wealth is greater than the demand enhancing effect.

Since the marginal impact of \$1000 increase in GDP per capital is roughly similar to that of a one point increase in the Scope Index, the regression estimates provide an alternative view on the economic significance of increasing the scope of competition laws. Expanding the scope of a nation's competition law enough to add one point to the Scope Index appears to be equivalent, in terms of its effect on the intensity of competition survey measure, to increasing GDP per capita by \$1000. Of course, this suggests that relatively small changes in the scope of the competition law can have an economically significant impact.

The log of population is included as an independent variable in order to directly control for the size of the market, which we assume increases with population. The results indicate that a one percent increase in population is associated with a .1 increase in the intensity of competition measure. This is a large impact, and suggests the relative importance of increasing the size of the market (e.g., entry of firms). As a policy implication, this estimate, coupled with the significant estimate for imports as a percent of GDP, suggests that opening local markets to global competition is the fastest way to increase the intensity of competition.

Government consumption as a percentage of GDP was included in order to control for the size of the public sector. Our assumption was that the level of public sector spending should have some impact on the intensity of competition, though the direction of the impact is unclear a priori. If government consumption tracks the degree to which government intervenes in the market and imposes a regulatory burden on firms, it should reduce the intensity of competition, primarily by limiting entry. If, on the other hand, government consumption tracks the degree to which government provides important public goods, such as law enforcement, it should be correlated with an increase in competitive intensity. In any event, the results in Tables 1 and 2 suggest that government spending does not have a substantial impact on the intensity of competition.

### Regional Effects Regressions

The last two columns of Tables 2 and 3 use dummy variables for each of the regions examined earlier in this study. The reason is to capture "fixed effects" specific to each region. If, for example, the economies of Non-EU Europe are less competitively intense than those of other regions, this method allows us to take that into account in the regression analysis. Since we are unable to include a dummy variable for each country,

which would be necessary to control for country-specific fixed effects, we consider these as “quasi-fixed effects” regressions.

The region excluded from the table is Asia, which means that the estimates for each region should be understood in comparison to Asia. For example, the statistically significant  $-.755$  estimate for Non-EU Europe implies that the perceived intensity of competition for the average Non-EU Europe country is almost a point below that of the average Asian country.

Several points are suggested by the regressions in columns 6 and 7 of Table 2. First, the effect of the competition law’s scope appears to be stronger when region specific effects are taken into account. Whereas the marginal impact is  $.020$  without the region specific dummy variables, the marginal impact is  $.028$  (see column 6) with them included. This difference is important because the region specific dummy variables may be controlling for more than just regional differences in perceived competitiveness.

Perhaps the most troubling problem that arises in a study such as this is how to estimate the impact of a competition law on the intensity of competition if the law itself is influenced or caused by the intensity of competition. The regressions examined in Table 1 assume that the level of competition intensity is influenced or “caused” by the scope of the competition law, and not the other way around. However, the causation may be the reverse: the scope of the competition law may result in part from the intensity of local competition. A competitively intense environment may not generate a call for a competition law. We will examine this issue – endogeneity – in more detail in a later part of this paper.

The quasi-fixed effects regressions provide an incomplete method of addressing one aspect of the endogeneity problem. Suppose there are unobservable factors that lead to the adoption of a competition law and that also affect the perceived intensity of competition. Suppose in addition that those factors differ by region and are largely uniform within each region. If so, then the quasi-fixed effects regressions permit us to mitigate the bias that would ordinarily result from being unable to incorporate these factors directly into the regression model.

The second point suggested by the last two columns is that enforcement may account for a substantial part of the estimated impact of the Scope Index. In general, the estimated impact of the scope measure falls when the agency dummy is included in the regression. In the last column of both Tables 2 and 3, the Scope Index is relatively small and statistically insignificant while the agency variable is relatively large and statistically significant.

The third point suggested by the last two regressions in Tables 2 and 3 is that Non-EU Europe stands apart from the rest of the world in terms of the perceived intensity of competition. The perceived intensity of competition in Non-EU Europe economies is significantly less than that in all other regions. This factor appears to explain a large part



of the increase in the estimated impact of the Scope Index after controlling for regional effects.

Why is Non-EU Europe lagging behind all other regions in terms of the perceived intensity of competition? Non-EU Europe includes several formerly socialist transition economies (Bulgaria, Croatia, Georgia, Macedonia, Romania, Russian Federation, Ukraine). In many of these countries, state created monopolies have been privatized but remain relatively unconstrained by competition. Moreover, state control over private business activity, such as the decision to enter a line of business, remains the norm. Under these conditions, the standard Cournot framework, even with a variable that controls for the level of public sector spending, may be insufficient to explain the variation in competition intensity outcomes.

## 2. Objective Measure of Competition Intensity as Dependent Variable

Tables 4 and 5 repeat the regressions of Tables 2 and 3, this time using an objective proxy for the intensity of competition, which also permits us to take advantage of a broader sample. In these regressions, we use the Purchasing Power Parity index (PPP) from the World Bank's World Development Indicators database. PPP is the exchange rate between currencies that equalizes in value a common basket of consumption items. For example, if a McDonald's hamburger is priced at USD 2.00 in the U.S. and GBP 1.00 in Britain, the PPP that equalizes the two currencies (American dollars and British pounds), treating hamburgers as the only item of consumption, is .5.

Since one of the reasons the price of hamburger can be relatively high is local market power, we view PPP as a potential proxy for the intensity of competition. Suppose, for example, that because of an increase in local market power, McDonald's is able to raise the price of its hamburger in Britain from GBP 1.00 to GBP 1.50. The PPP that equalizes dollars and pounds then increase from .5 to .75.

This example suggests that even though PPP is just an exchange, and for that reason meaningless,<sup>35</sup> it may still serve as an index that captures to some degree the effects of market power on prices. If the Scope Index measure has a negative and statistically significant impact on PPP, we regard that as evidence as that it is increasing the intensity of competition.

However, as Tables 4 and 5 reveal, the scope of the competition law does not have a statistically significant impact on PPP. The sign of the Scope Index coefficient is often negative, suggesting that there may be a procompetitive effect. However, the legal scope

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<sup>35</sup> Of course, the core of the problem here is that there are no good objective proxies that would allow us to assess competitive intensity across countries. An alternative to using PPP is to use the GDP deflator multiplied by the Purchasing Power Parity index. For this approach see Helmut Ziegelschmidt et al., Product Market Competition and Economic Performance in Australia (OECD Working Paper No. 451, Oct. 2005) (available <http://ideas.repec.org/j/K20.html>). The GDP deflator is often used to measure relative prices over time within an economy. However, since most publicly available GDP deflator series do not use common base periods, it is unclear that additional accuracy could be gained by using this approach instead of the direct comparison of PPPs.

measure is statistically insignificant in all of the regressions. The same is true of the variable measuring the age of the competition statute; it has a consistently negative coefficient, which suggests a procompetitive impact, but it is statistically insignificant.

As for the other variables, perhaps the most interesting suggestion from Tables 4 and 5 is that Non-EU Europe is not as bad as it is perceived in terms of the intensity of competition. PPPs do not appear to be higher in that region than in most other regions. Africa, on the other hand, appears to be worse than perceived.

### C. Assessing Components of the Scope Index

Table 6 breaks down the Scope Index into its key components, which are subindexes measuring the scope of the law on restrictive trade practices, the scope of the law on dominance, and the scope of merger law. Our goal here is to see if there is any particular portion of competition law that is associated with greater intensity of competition. Table 6 examines the impacts of the subindexes on the WEF's survey measure of the intensity of competition.

Interestingly, the subindexes measuring substantive law – dominance, restrictive trade practices, and mergers – have statistically insignificant coefficients for the most part. However, the dominance index has a negative sign in the 2004 regressions and is both negative and statistically significant in one regression. In other words, there is weak evidence that increasing the scope of dominance law reduces the perceived intensity of competition.

The exceptional case in Table 6 is the subindex for enforcement, which is positive and statistically significant in the year 2004 regressions. The 2004 results suggest that a one point increase in the enforcement subindex increases the intensity of competition survey measure by .13. Of course, since the enforcement subindex has a maximum value of 3, increasing enforcement measures can have only a limited impact. Still, the marginal impact of the enforcement variable is roughly six times that of the overall scope measure, which suggests that enforcement is more important than the scope of the substantive law.

The signs and magnitudes of the subindexes suggest a ranking of the major components of competition law in terms of their effectiveness: enforcement, restrictive trade practices, mergers, and dominance. While the estimates suggest that increasing the scope of restrictive trade practices law may enhance perceived competition intensity, increasing the scope of merger or dominance law appears not to offer such a potential gain. Indeed, the third column suggests that increasing the dominance law index by one point reduces the perceived competition intensity by roughly one tenth of a point, which is equivalent in effect, according to the same regression, to reducing GDP per capita by \$1000.

Table 7 examines the impacts of the same subindexes on our objective proxy for the intensity of competition, the PPP index. There is no evidence suggesting that any of the subindexes reduce prices. The estimated coefficients for the subindexes are statistically insignificant.

#### D. Endogeneity of Scope Index and Instrumental Variables Estimation

Given the causation and endogeneity issues, briefly discussed in Part IV.B.1, the statistically significant estimates for the Scope Index have to be regarded with some suspicion. The standard approach to estimation in the presence of potential endogeneity bias is to use instrumental variables estimation. In this part we report instrumental variable estimates of the impact of the Scope Index.

To take a simple illustration of the endogeneity problem, suppose legislators in Zanadu are contemplating the enactment of a competition law, or expanding the scope of a law already in existence. In legislative debates, opponents might note that competition is already perceived to be intense in Zanadu, and that there is, therefore, no need for such a law or expansion of existing law. If the competition law opponents prevailed on the basis of this argument, then the perceived intensity of competition would have impacted the scope of the competition law in Zanadu.

This illustration suggests that the key to finding suitable regressors is to find variables that affect the likelihood of a competition law being enacted, or modified, and at the same time are not influenced by the intensity of competition. These variables would make ideal instrumental variables. Of course, this is difficult to find in the context of competition law. The goal for this project is to find instruments for the scope of the law variable. This requires finding variables that satisfy the above requirement and that in addition are not obvious candidates as regressors in the competition intensity equation.

We have taken instruments from two sources. One is the “legal origin” variables of the “law and growth” literature.<sup>36</sup> The other source is the WEF’s survey tables, which provide additional perception indexes that could serve as instrumental variables.

The legal origin variables indicate whether the legal system in a country has its origins in the English, French, Scandinavian, German, or Socialist legal traditions. Legal origin is clearly unaffected by the perceived intensity of competition. Yet it may have an impact on the likelihood that a country will adopt a competition law, since the tendency toward interventionist policies appears to be influenced by legal origin.<sup>37</sup>

The WEF’s survey tables also provide indexes that probably track variables that influence the likelihood of adoption or the scope of a competition law. For example, in addition to surveying the intensity of competition, the WEF’s tables includes indexes measuring perceived favoritism of government to firms, the perceived regional disparity in the economic environment (e.g., infrastructure), and the perceived degree to which government subsidies distort markets. Many of these perceptions probably influence the likelihood that a competition law will be enacted, expanded, or maintained.

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<sup>36</sup> Rafael La Porta et al., *The Quality of Government*, 15 J.L. ECON. & ORG. 222 (1999).

<sup>37</sup> *Id.*

Still, the difficulty in using many of the WEF's survey measures is that they are likely to be correlated with the perceived intensity of competition. The same business person who tells a WEF surveyor that competition is not intense in his country is also likely to think that government plays favorites among firms, or distorts the market with subsidies. Although these survey measures may explain the existence of a competition law, they are likely to be correlated with the perceived intensity of competition, the variable we are attempting to explain.

In view of the difficulty of finding plausible instruments, we settled on the legal origin variables and the WEF's survey measure of regional disparity in the economic environment. Regional disparity apparently played some role in the enactment of the Sherman Act in the U.S. Boudreaux, DiLorenzo, and Parker argue that farm lobbies seeking protection from the competition of large scale processing centers in cities played a substantial role in the enactment of U.S. antitrust law.<sup>38</sup> Moreover, it is plausible that if firms believe that certain advantages attributable to economic environment, such as infrastructure, affect their ability to compete, they will pressure legislators for a competition law.

The instrumental variable regression results appear in Table 8. The first and third columns of Table 8 use only the legal origin variables as instruments for the Scope Index. The second and fourth columns use the legal origin variables and the WEF's index of perceived regional disparity in the quality of the economic environment. Both regressions fail to show a statistically significant impact for the Scope Index.

Of course, these results are equally consistent with the theory that the law's scope does positively impact the intensity of competition, but we have simply failed to find a good set of instruments.<sup>39</sup> The results of the instrumental variables regressions are inconclusive.

## V. Conclusion

Every empirical study is tentative or provisional in the sense that its results are valid, at best, until the next empirical study upends its conclusions. The same caveat applies here. Empirical researchers will develop better ways to measure the scope of antitrust law and to test its effectiveness in promoting competition than the methods used in this paper.

This paper has presented measures of the scope of competition law and its various components, such as the laws governing restrictive trade practices and dominance. Given the difficulty of saying anything useful about the laws of 102 countries, we have limited ourselves to regional comparisons. The regional comparisons suggest that for large

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<sup>38</sup> McChesney, *supra* note 4, at 255-270.

<sup>39</sup> On the problems generated by using instruments that are weak explanatory variables for the endogenous variables see John Bound et al., *Problems with Instrumental Variables Estimation when the Correlation Between the Instruments and the Endogenous Explanatory Variables is Weak*, 90 J. OF THE AM. STAT. ASS'N 443 (1995).

enterprises “antitrust risk” – the risk of being found in violation of some competition law provision – is substantially higher in the European Union than anywhere else.

Ordinary least squares regressions of the impact of the law’s scope suggest that it has a positive impact on perceived competitive intensity. However, these estimates have to be regarded with suspicion as statements about the impact of the law on the real intensity of competition. Moreover, instrumental variable estimates reported here, although preliminary, fail to show a significant impact for competition law.

There are many questions that could not be addressed within the scope of this paper. For example, does the scope of competition law have a positive impact on a nation’s wealth? Does the scope of a country’s merger law have a substantial impact on the frequency of merger activity within the country? In addition, the results here suggest that the key empirical challenge going forward is obtaining estimates of the impact of competition statutes that are plausibly free of an endogeneity bias.

**Table 2****Competition Intensity Regressions, Year 2003**

<i>Dependent variable: Competition Intensity</i>	<i>Reg. 1</i>	<i>Reg. 2</i>	<i>Reg. 3</i>	<i>Reg. 4</i>	<i>Reg. 5</i>	<i>Reg. 6</i>	<i>Reg. 7</i>
Independent variables:	Coefficient ( t-stat )						
<i>Constant</i>	1.93 (2.77)	1.92 (2.46)	2.12 (2.42)	2.04 (2.87)	1.78 (1.33)	2.69 (2.43)	2.94 (2.60)
<i>Scope Index</i>	.020*** (2.51)	.020*** (2.34)	.017*** (1.78)	.015 (1.49)	.014 (.82)	.028*** (2.29)	.021 (1.67)
<i>GDP per capita</i>	.00003*** (3.92)	.00003*** (3.77)	.00003*** (3.08)	.00002*** (3.50)	.00002*** (2.94)	.00002*** (2.69)	.00002*** (2.63)
<i>Imports ÷ GDP</i>	.009*** (3.13)	.009*** (3.11)	.007*** (2.46)	.008*** (2.94)	.007 (1.31)	.007*** (2.14)	.006** (1.74)
<i>Log Population</i>	.108*** (2.79)	.109*** (2.63)	.099*** (2.28)	.102*** (2.58)	.128** (1.88)	.070 (1.29)	.053 (.97)
<i>Age of Competition Law</i>	.004 (1.11)	.004 (1.11)	.003 (.95)	.003 (1.03)	.003 (.84)	.003 (.56)	.001 (.19)
<i>Government Consumption ÷ GDP</i>		.0003 (.02)				.011 (.79)	.007 (.52)
<i>Average Wage</i>			.0004 (.08)		.0004 (.09)	.0007 (.16)	.0008 (.19)
<i>Competition Agency</i>				.157 (.93)			.352** (1.78)
<i>Enforcement Budget ÷ GDP Africa</i>					19.99 (1.43)		
<i>MidEast/North Africa</i>						-.107 (.28)	.020 (.05)
<i>Oceania</i>						-.133 (.38)	-.058 (.17)
<i>Caribbean</i>						.180 (.45)	.113 (.28)
<i>Non-EU Europe</i>						.540 (1.36)	.657 (1.61)
<i>EU Europe</i>						-.806*** (2.90)	-.862*** (3.10)
<i>North America</i>						-.348 (1.35)	-.368 (1.43)
<i>South America</i>						-.240 (.51)	-.111 (.23)
<i>Central America</i>						-.299 (1.14)	-.252 (.91)
						-.428 (1.57)	-.343 (1.22)
Adj R-squared	.46	.45	.40	.46	.29	.50	.52
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0039	0.0000	0.0000
<b>N observations</b>	78	78	68	77	46	68	67

Notes: 1. \*\*\* for variables that are at 5% significance level are italic, \*\* for those at 10% significance level.

2. Absolute values of t-statistics appear in below coefficient estimates

**Table 3****Competition Intensity Regressions, Year 2004**

<i>Dependent variable: Competition Intensity</i>	<i>Reg. 1</i>	<i>Reg. 2</i>	<i>Reg. 3</i>	<i>Reg. 4</i>	<i>Reg. 5</i>	<i>Reg. 6</i>
Independent variables:	Coefficient (t-stat)					
<i>Constant</i>	1.93 (2.74)	1.55 (2.18)	2.85 (2.99)	2.01 (2.81)	3.07 (3.83)	2.95 (3.24)
<i>Scope Index</i>	.024*** (3.20)	.016*** (2.21)	.028*** (2.50)	.022*** (2.37)	.019** (1.80)	.015** (1.98)
<i>GDP per capita</i>	.00001*** (2.36)	.00001** (1.96)	-2.7e-07 (.03)	.00002*** (2.19)	.00001 (.87)	.00001 (1.29)
<i>Imports ÷ GDP</i>	.008*** (3.02)	.009*** (3.50)	.007*** (1.98)	.008*** (2.83)	.006*** (2.38)	.005** (1.83)
<i>Log Population</i>	.105*** (2.68)	.121*** (3.22)	.053 (.95)	.102*** (2.58)	.055 (1.26)	.064 (1.47)
<i>Age of Competition Law</i>	.008** (1.92)	.008*** (2.11)	.015*** (2.29)	.008** (1.89)	.010*** (2.08)	.007** (1.74)
<i>Government Consumption ÷ GDP</i>		.015 (1.44)				.034*** (3.02)
<i>Average Wage</i>			.004 (1.14)		.003 (1.02)	.0008 (.19)
<i>Competition Agency</i>				.042 (.26)		.378** (1.88)
<i>Enforcement Budget ÷ GDP</i>					9.87 (.74)	
<i>Africa</i>						-.644*** (3.05)
<i>MidEast/North Africa</i>						-.686*** (3.04)
<i>Oceania</i>						---
<i>Caribbean</i>						.009 (.03)
<i>Non-EU Europe</i>						-.932*** (3.84)
<i>EU Europe</i>						-.406 (1.90)
<i>North America</i>						---
<i>South America</i>						-.602*** (2.60)
<i>Central America</i>						-.457** (1.86)
Adj R-squared	.43	.45	.42	.42	.50	.54
Prob > F	0.0000	0.0000	0.0008	0.0000	0.0020	0.0000
<b>N observations</b>	91	90	36	90	29	90

Notes: \*\*\* for variables that are at 5% significance level are italic, \*\* for those at 10% significance level.

**Table 4**  
**Purchasing Power Parity Regressions, Year 2003**

<i>Dependent variable:</i> <i>Log PPP</i>	<i>Reg. 1</i>	<i>Reg. 2</i>	<i>Reg.3</i>	<i>Reg.4</i>
<i>Independent variables:</i>	Coefficient ( t-stat )			
<i>Constant</i>	3.01 (1.06)	3.94 (.91)	-.670 (.27)	3.17 (.90)
<i>Scope Index</i>	-.018 (.65)	.056 (1.19)	-.046 (1.35)	.018 (.54)
<i>GDP per capita</i>	-.00005** (1.78)	-.00002 (.53)	-.00008*** (2.29)	-.00001 (.31)
<i>Imports ÷ GDP</i>	-.009 (.81)	-.006 (.38)	-.012 (1.10)	-.005 (.46)
<i>Log Population</i>	.158 (1.01)	-.016 (.07)	.312*** (2.10)	.112 (.62)
<i>Age of Competition Law</i>	-.008 (.50)	-.006 (.33)	-.009 (.54)	-.007 (.34)
<i>Government Consumption ÷ GDP</i>	-.106*** (2.83)	-.108** (1.72)		-.117*** (3.02)
<i>Average Wage</i>		-.015 (.61)		
<i>Competition Agency</i>			.331 (.50)	
<i>Enforcement Budget ÷ GDP</i>				
<i>Africa</i>				1.370** (1.70)
<i>MidEast/North Africa</i>				-.019 (.02)
<i>Oceania</i>				-2.347 (1.20)
<i>Caribbean</i>				-1.059 (.87)
<i>Non-EU Europe</i>				.016 (.02)
<i>EU Europe</i>				-1.496 (1.65)
<i>North America</i>				-2.084 (.86)
<i>South America</i>				-.041 (.04)
<i>Central America</i>				-1.647 (1.47)
Adj R-squared	.17	.12	.13	.23
Prob > F	0.0000	0.2080	0.0002	0.0000
<b>N observations</b>	145	83	150	145

Notes: \*\*\* for variables that are at 5% significance level are italic, \*\* for those at 10% significance level.



**Table 5**  
**Purchasing Power Parity Regressions, Year 2004**

<i>Dependent variable:</i> <i>Log PPP</i>	<i>Reg. 1</i>	<i>Reg. 2</i>	<i>Reg. 3</i>	<i>Reg. 4</i>
Independent variables:	Coefficient ( t-stat )			
<i>Constant</i>	5.47 (1.72)	5.86 (.92)	1.234 (.45)	4.62 (1.21)
<i>Scope Index</i>	-.028 (.90)	.007 (.09)	-.031 (.80)	.018 (.51)
<i>GDP per capita</i>	-.00005 (1.39)	-.00007 (1.19)	-.00006 (1.62)	-.00001 (.17)
<i>Imports ÷ GDP</i>	-.012 (1.06)	.005 (.25)	-.012 (1.08)	-.007 (.56)
<i>Log Population</i>	.027 (.15)	-.168 (.49)	.209 (1.31)	.035 (.18)
<i>Age of Competition Law</i>	-.013 (.60)	.042 (1.09)	-.019 (.86)	-.015 (.67)
<i>Government Consumption ÷ GDP</i>	<i>-.096***</i> (2.47)	-.104 (1.02)		<i>-.122***</i> (3.00)
<i>Average Wage</i>		-.006 (.24)		
<i>Competition Agency</i>			-.026 (.04)	
<i>Enforcement Budget ÷ GDP</i>				
<i>Africa</i>				1.360** (1.58)
<i>MidEast/ North Africa</i>				.566 (.62)
<i>Oceania</i>				---
<i>Caribbean</i>				-1.257 (.83)
<i>Non-EU Europe</i>				.088 (.08)
<i>EU Europe</i>				-1.682** (1.70)
<i>North America</i>				---
<i>South America</i>				.019 (.02)
<i>Central America</i>				-1.890 (1.55)
Adj R-squared	.15	-.06	.11	.21
Prob > F	0.0002	0.6719	0.0020	0.0001
<b>N observations</b>	130	40	134	130

Notes: \*\*\* for variables that are at 5% significance level are italic, \*\* for those at 10% significance level.

**Table 6****Competition Intensity Regressions Using Components of Competition Law, Years 2003 and 2004**

<i>Dependent variable:</i> <i>Competition Intensity</i>	<i>Reg. 1</i> <i>2003</i>	<i>Reg. 2</i> <i>2003</i>	<i>Reg. 1</i> <i>2004</i>	<i>Reg. 2</i> <i>2004</i>
Independent variables:	Coefficient (t-stat)			
<i>Constant</i>	1.70 (2.08)	2.05 (2.81)	1.77 (2.51)	2.96 (2.58)
<i>Restrictive Trade Practices</i>	.041 (1.01)	.019 (.45)	.047 (1.35)	.027 (.70)
<i>Dominance</i>	.009 (.14)	.033 (.46)	-.091** (1.89)	-.0522 (.94)
<i>Merger</i>	-.038 (1.20)	-.036 (1.19)	-.025 (.91)	-.002 (.07)
<i>Enforcement</i>	.072 (1.52)	.065 (1.31)	.137*** (3.36)	.140*** (2.99)
<i>GDP per capita</i>	.00002*** (3.30)	.00002*** (3.31)	.00001** (1.67)	.00002*** (2.12)
<i>Imports ÷ GDP</i>	.010*** (3.30)	.009*** (3.14)	.008*** (3.45)	.006 (1.63)
<i>Log Population</i>	.112*** (2.63)	.097*** (2.38)	.103*** (2.80)	.083*** (2.10)
<i>Age of Competition Law</i>	.004 (1.27)	.004 (1.17)	.009*** (2.23)	.008** (1.95)
<i>Government Consumption ÷ GDP</i>	.009 (.74)		.022** (1.96)	
<i>Average Wage</i>				
<i>Competition Agency</i>		.128 (.76)		-.014 (.08)
Adj R-squared	.46	.46	.49	.45
Prob > F	0.0000	0.0000	0.0000	0.0000
<b>N observations</b>	78	77	90	90

Notes: \*\*\* for variables that are at 5% significance level are italic, \*\* for those at 10% significance level.

**Table 7****PPP Regressions Using Components of Competition Law, Years 2003 and 2004**

<i>Dependent variable:</i>	<i>Reg. 1</i>	<i>Reg. 2</i>	<i>Reg. 1</i>	<i>Reg. 2</i>
<i>Log PPP</i>	<i>2003</i>	<i>2003</i>	<i>2004</i>	<i>2004</i>
Independent variables:	Coefficient (t-stat)			
<i>Constant</i>	2.65 (.91)	-.767 (.29)	5.08 (1.56)	1.42 (.51)
<i>Restrictive Trade Practices</i>	.052 (.31)	.121 (.68)	.105 (.58)	.252 (1.45)
<i>Dominance</i>	.044 (.18)	-.078 (.29)	.007 (.03)	-.143 (.56)
<i>Merger</i>	-.063 (.50)	-.126 (.96)	-.095 (.70)	-.184 (1.37)
<i>Enforcement</i>	-.126 (.60)	-.135 (.62)	-.163 (.75)	-.100 (.44)
<i>GDP per capita</i>	-.00005 (1.58)	-.00007*** (2.04)	-.00005 (1.29)	-.00005 (1.41)
<i>Imports ÷ GDP</i>	-.008 (.75)	-.012 (1.06)	-.012 (1.08)	-.013 (1.14)
<i>Log Population</i>	.175 (1.10)	.314*** (2.07)	.043 (.24)	.196 (1.22)
<i>Age of Competition Law</i>	-.009 (.54)	-.010 (.60)	-.014 (.65)	-.019 (.90)
<i>Government Consumption ÷ GDP</i>	-.102*** (2.62)		-.0862*** (2.09)	
<i>Average Wage</i>				
<i>Competition Agency</i>		.336 (.50)		-.033 (.05)
Adj R-squared	.16	.12	.14	.11
Prob > F	0.0001	0.0010	0.0013	0.0035
<b>N observations</b>	145	150	130	134

Notes: \*\*\* for variables that are at 5% significance level are italic, \*\* for those at 10% significance level.

**Table 8****Competition Intensity Instrumental Variable Regressions, Years 2003 and 2004**

<i>Dependent variable:</i> <i>Competition Intensity</i>	<i>Reg. 1</i> <i>2003</i>	<i>Reg. 2</i> <i>2003</i>	<i>Reg. 3</i> <i>2004</i>	<i>Reg. 4</i> <i>2004</i>
Independent variables:	Coefficient ( t-stat )			
<i>Constant</i>	1.66 (1.98)	1.63 (1.91)	1.33 (1.66)	1.30 (1.21)
<i>Scope Index</i>	-.0003 (.01)	-.004 (.16)	-.005 (.89)	-.008 (.35)
<i>GDP per capita</i>	.00003*** (5.37)	.00003*** (5.35)	.00003*** (4.00)	.00003*** (3.99)
<i>Imports ÷ GDP</i>	.007*** (2.30)	.007*** (2.20)	.006*** (2.19)	.006*** (2.11)
<i>Log Population</i>	.139*** (2.80)	.143*** (2.84)	.153*** (3.40)	.156*** (3.40)
<i>Government Consumption ÷ GDP</i>	.010 (.62)	.012 (.73)	.029** (1.72)	.030** (1.80)
Adj R-squared	.40	.37	.33	.21
Prob > F	0.0000	0.0000	0.0000	0.0001
<b>N observations</b>	78	78	89	89

Notes: 1.Columns 1 and 3 use legal tradition instruments only

2.Columns 2 and 4 use legal tradition instruments plus the regional disparity survey measure from the WEF (2004).

**Appendix**  
**Table A1: New Zealand**

Governed by: Commerce Act of 1986 last amended (hereinafter referred to as  
“Commerce Act”)<sup>40</sup>

Category	Subcategory	Score	Comment
Scope	Extraterritoriality	1	Article 4 of the Commerce Act says that it applies to any action that has an effect in New Zealand
Remedies	Fines	1	Article 80 allows the Commission to impose fines for violations to the Act.
	Prison sentences	0	
	Divestitures	1	Article 85 says that the court may order divestiture of assets or shares for violations of Article 47.
Private Enforcement	3rd party initiation	0	
	Remedies available to 3rd parties	0	
	3rd party rights in proceedings	0	
Merger Notification	Voluntary	1	Article 66 allows people to obtain clearance of proposed mergers.
	Mandatory	0	
	Pre-merger	2	Clearance can be obtained until the merger is completed.
	Post-merger	0	
Merger Assessment	Dominance	0	
	Restriction of competition	1	Article 47 prohibits mergers that are likely to substantially lessen competition in the market.
	Public interest (Pro Defendant)	1	Article 67 allows the Commission to give clearance for a merger that has benefits to the public that outweigh the detriments to competition.
	Public interest (Pro Authority)	0	
	Other	0	
	Efficiency	0	
Dominance	Limits access	1	Article 40 prohibits withholding the supply of goods.
	Abusive acts	1	Article 36(1) prohibits the abuse of market power.
	Price Setting	0	
	Discriminatory pricing	0	
	Resale price maintenance	1	Article 37 prohibits resale price maintenance.
	Obstacles to entry	1	Article 36(2) prohibits restricting entry into the market by use of market power.
	Efficiency Defense	1	Article 3A says that the Commission is to take into

<sup>40</sup> See Statutes of New Zealand, *New Zealand Parliamentary Council Office*, [http://www.legislation.govt.nz/browse\\_vw.asp?content-set=pal\\_statutes](http://www.legislation.govt.nz/browse_vw.asp?content-set=pal_statutes).

			account any positive effects on efficiency that are likely to benefit the public when evaluating a violation.
Restrictive Trade Practices	Price fixing	1	Article 30 prohibits price fixing.
	Tying	0	
	Market Division	0	
	Output restraint	1	Article 29(1)(b) prohibits agreements that limit the supply of goods to a class of persons
	Market sharing	1	Article 27 prohibits agreements that have the effect or purpose of lessening competition
	Eliminating competitors	1	Article 27(1) prohibits acts or agreements that have the purpose of reducing competition
	Collusive tendering/bid-rigging	1	Article 27 prohibits understandings that have the effect of reducing competition
	Supply refusal	1	Article 29 prohibits group boycotts.
	Efficiency Defense	1	Article 3A says that the Commission is to take into account any positive effects on efficiency that are likely to benefit the public when evaluating a violation.

Table A2: Belgium (national law)

Governed by: Law on the Protection of Economic Competition of 5 August 1991, amended by Royal Decree of 14 June 1999 (herein after referred to as Competition Act).<sup>41</sup>

Category	Subcategory	Score	Comment
Scope	Extraterritoriality	1	The Competition Act can be applied to anything that has an effect on the Belgian market.
Remedies	Fines	1	Articles 36, 37, 38, and 40 allow levying fines for certain violations.
	Prison sentences	1	Article 44 allows for prison sentences for criminal violations.
	Divestitures	0	
Private Enforcement	3rd party initiation	0	
	Remedies available to 3rd parties	0	Nothing saying that damaged 3rd parties cannot file a private tort claim but it is not provided for
	3rd party rights in proceedings	1	Article 32(2) says that 3rd parties have the right to be heard by the Council if they can demonstrate a sufficient interest.
Merger Notification	Voluntary	0	
	Mandatory	3	Article 10(1) says the concentrations shall be subject to the prior consent of the Competition Council.
	Pre-merger	2	Article 10(1) says the concentrations shall be subject to the prior consent of the Competition Council.
	Post-merger	0	
Merger Assessment	Dominance	1	Article 10(2)(b) says that the council must take into account, the market position of the companies.
	Restriction of competition	1	Article 10(2)(a) says that the council is to take into consideration the necessity of maintaining effective competition.
	Public interest (Pro D)	1	Article 10(6) says that if the public interest justifies it, the Council may permit a concentration which would be otherwise impermissible.
	Public interest (Pro Authority)	0	
	Other	0	
	Efficiency	1	Article 10(2)(b) requires looking at the effects such a merger would have on economic and technological progress.
Dominance	Limits access	0	
	Abusive acts	1	Article 2(1) lists several abusive acts which are prohibited.
	Price Setting	1	Article 3(a) prohibits dominant companies from imposing unfair prices.

<sup>41</sup> *Competition Law in the EU* at 795.

	Discriminatory pricing	1	Article 3(c) prohibits applying dissimilar conditions to equivalent transactions.
	Resale price maintenance	0	
	Obstacles to entry	0	
	Efficiency Defense	0	
Restrictive Trade Practices	Price fixing	1	Article 2(1)(a) of the Competition Act prohibits directly or indirectly fixing prices by individual companies or cartels.
	Tying	1	Article 2(1)(e) and Article 3(d) prohibit tying.
	Market Division	1	Article 2(1)(b) prohibits limiting or controlling production, markets or investment.
	Output restraint	1	Article 2(1)(b) prohibits limiting production, markets, development, and investment by individual companies or cartels.
	Market sharing	1	Article 2(1)(c) prohibits market sharing.
	Eliminating competitors	0	
	Collusive tendering/bid-rigging	0	
	Supply refusal	1	Article 2(1)(b) prohibits limiting production, markets, development, and investment by individual companies or cartels.
	Efficiency Defense	1	Article 2(3) exempts agreements from the Article 2(1) prohibitions if they contribute to improving production or distribution of goods or promote technical or economic progress.



Table A3: Belgium (EU law)

Governed by: Law on the Protection of Economic Competition of 5 August 1991, amended by Royal Decree of 14 June 1999 (herein after referred to as Competition Act).<sup>42</sup>

Category	Subcategory	Score	Comment
Scope	Extraterritoriality	1	The Competition Act can be applied to anything that has an effect on the Belgian market.
Remedies	Fines	1	Articles 36, 37, 38, and 40 allow levying fines for certain violations.
	Prison sentences	1	Article 44 allows for prison sentences for criminal violations.
	Divestitures	1	Article 7 of Council Regulation No 1/2003 allows for structural remedies
Private Enforcement	3rd party initiation	0	
	Remedies available to 3rd parties	0	Nothing saying that damaged 3rd parties cannot file a private tort claim but it is not provided for
	3rd party rights in proceedings	1	Article 32(2) says that 3rd parties have the right to be heard by the Council if they can demonstrate a sufficient interest.
Merger Notification	Voluntary	0	
	Mandatory	3	Article 7(1) of CR 139/2004 requires notification <sup>43</sup>
	Pre-merger	2	Article 7(1) of 139/2004 requires pre-clearance
	Post-merger	0	
Merger Assessment	Dominance	1	Article 2(1) of CR 139/2004 considers dominance
	Restriction of competition	1	Article 2(1)(a) of CR 139/2004 considers effect on competition in the market
	Public interest (Pro D)	1	Article 2(1)(b) of CR 139/2004 considers the development of technical and economic progress
	Public interest (Pro Authority)	1	Article 2(1)(b) of CR 139/2004 considers the interests of intermediate and ultimate consumers
	Other	0	
	Efficiency	1	Article 2(4) of CR 139/2004 allows an efficiency defense
Dominance	Limits access	1	Article 82(b) prohibits limiting access
	Abusive acts	1	Article 82 prohibits abuse of a dominant position
	Price Setting	1	Article 82(a) prohibits price setting
	Discriminatory pricing	1	Articles 81(1)(d), 82(c) prohibit discriminatory conditions

<sup>42</sup> *Id.* at 795.

<sup>43</sup> The new merger notification guidelines implemented by Council Regulation 139/2004 give undertakings the ability to request exemption from notification requirements. However, because a formal request must be submitted and approved in order to gain exemption, the new notification guidelines are encoded as requiring mandatory pre-merger notification.

	Resale price maintenance	1	Article 81 prohibits minimum resale price restrictions <sup>44</sup>
	Obstacles to entry	1	Article 82 prohibits anti-competitive pricing schemes <sup>45</sup>
	Efficiency Defense	0	
Restrictive Trade Practices	Price fixing	1	Article 81(1)(a) prohibits price fixing
	Tying	1	Articles 81(1)(e), 82(d) prohibit tying
	Market Division	1	Article 81 prohibits customer allocation clauses <sup>46</sup>
	Output restraint	1	Article 81(1)(b) prohibits limiting production
	Market sharing	1	Article 81(1)(c) prohibits market sharing
	Eliminating competitors	1	Article 81(1) prohibits agreements that have the purpose or effect of eliminating competition
	Collusive tendering/bid-rigging	1	Article 81 prohibits bid-rigging
	Supply refusal	1	Article 81(1)(b) prohibits supply refusal
	Efficiency Defense	1	Article 81(3) allows an efficiency defense

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<sup>44</sup> *EC Competition Law*, at 97.

<sup>45</sup> *Id.* at 283.

<sup>46</sup> *Id.* at 97.

Appendix Table A4: List of Countries and Scores

Country (as of 2004)	Scope Index	RTP Eff. D	Dom Eff. D	Merge Eff. D	Merge P. I. D.	RTP	Dom	Merger	Remedies
Albania	19	1	0	0	0	4	5	4	2
Algeria	15	0	0	0	1	4	4	6	1
Argentina	21	0	0	0	0	8	5	6	1
Armenia	16	0	0	1	0	4	4	5	2
Australia	25	1	1	1	1	8	6	4	3
Austria	18	1	0	0	1	5	4	4	2
Azerbaijan	20	0	0	0	0	6	5	5	2
Barbados	25	1	1	1	0	6	6	7	3
Bangladesh	14	1	0	1	0	6	1	5	2
Belarus	25	0	1	0	0	8	5	6	2
Belgium	19	1	0	1	1	6	3	6	2
Bolivia	11	0	0	1	1	4	4	2	1
Bosnia-Herzegovina	17	1	1	1	1	5	4	6	1
Brazil	20	0	0	1	0	6	6	4	1
Bulgaria	17	1	0	0	0	4	4	6	1
Burkina Faso	15	1	1	0	0	5	5	0	2
Cameroon	17	1	1	1	1	4	3	6	2
Canada	18	1	1	1	0	5	4	5	3
Chile	10	0	0	0	0	4	3	0	2
China	9	0	0	0	0	3	3	0	1
Colombia	12	0	0	0	0	3	3	5	1
Costa Rica	19	0	0	0	0	6	4	5	2
Cote d'Ivoire	12	1	1	0	0	5	3	2	2
Croatia	19	1	0	1	1	5	4	6	1
Cyprus	21	1	0	1	1	4	4	7	2
Czech Republic	19	1	0	0	1	6	5	6	1
Denmark	21	1	0	0	0	5	5	6	1
Dominican Republic	7	0	0	0	0	3	1	1	2
El Salvador	10	0	0	0	0	4	3	0	2
Estonia	21	1	0	0	1	6	4	6	2
Faroe Island	5	0	0	0	0	0	1	3	1
Finland	20	0	0	0	0	4	5	6	1
France	18	1	1	0	0	7	4	2	2
Georgia	16	0	0	0	0	1	5	5	1
Germany	19	0	0	0	0	4	5	5	1
Greece	20	1	0	1	1	4	5	7	1
Guatemala	5	0	0	0	0	1	1	1	2
Hungary	24	1	0	0	0	8	5	6	2
Iceland	18	1	0	0	0	5	5	5	2
India	22	1	0	1	0	6	5	4	3
Indonesia	23	0	0	0	0	8	6	5	2

Ireland	18	1	0	0	0	4	4	4	2
Israel	16	1	0	0	0	3	3	6	3
Italy	19	1	0	0	0	5	5	6	1
Jamaica	19	1	1	0	0	7	6	1	2
Japan	16	0	0	0	0	2	3	6	3
Jordan	22	0	0	1	0	6	6	6	1
Kazakhstan	22	0	0	0	0	6	5	6	2
Kenya	18	0	0	1	0	6	1	7	2
Korea	24	1	0	1	0	8	6	5	2
Kyrgyzstan	24	1	1	1	1	7	5	6	3
Lao PDR	12	1	1	1	1	7	1	1	1
Latvia	20	1	0	0	0	6	4	6	1
Lithuania	21	0	0	0	0	5	4	6	2
Luxemburg	10	1	0	0	0	4	4	0	1
Macedonia	17	1	0	0	1	2	4	6	1
Malawi	25	0	0	1	1	8	5	7	2
Mali	13	0	0	0	0	4	6	0	1
Malta	17	1	0	0	0	4	4	6	1
Mauritius	13	0	0	0	0	5	4	0	2
Mexico	23	1	1	1	0	8	5	5	2
Moldova	22	0	0	0	0	7	5	5	2
Mongolia	16	0	0	0	0	7	6	0	1
Morocco	17	1	1	0	0	3	4	7	2
Namibia	21	1	1	1	1	5	5	7	2
Netherlands	21	1	1	0	0	4	5	7	1
New Zealand	16	1	1	0	1	6	4	3	2
Nigeria	10	0	0	0	0	0	0	7	3
Norway	20	1	0	0	0	5	5	5	2
Pakistan	14	1	0	1	0	6	1	5	2
Panama	20	1	1	0	0	8	4	5	1
Papua New Guinea	13	1	1	0	1	4	3	2	2
Paraguay	2	0	0	0	0	1	1	0	0
Peru	13	0	0	0	0	7	3	0	1
Philippines	7	0	0	0	0	1	1	2	2
Poland	19	1	0	0	0	6	4	6	1
Portugal	21	1	0	0	0	5	5	7	2
Romania	22	1	0	1	1	7	4	6	3
Russian Federation	21	1	1	0	0	5	5	5	3
Senegal	15	0	0	0	0	8	6	0	1
Slovak Republic	19	1	0	0	0	5	4	5	1
Slovenia	20	1	0	0	0	5	4	7	1
South Africa	20	1	1	1	1	3	5	6	3
Spain	23	1	0	1	1	6	5	6	2

Sri Lanka	7	0	1	1	0	0	1	1	3
Sweden	22	1	0	0	1	6	5	6	1
Switzerland	21	1	1	0	1	4	5	7	1
Taiwan	22	1	1	1	0	7	4	5	3
Tajikistan	20	0	0	0	0	7	5	5	2
Tanzania	14	1	1	1	1	4	1	6	1
Thailand	20	1	0	0	0	7	3	6	2
Tunisia	13	1	1	1	0	4	3	4	2
Turkey	20	1	0	0	0	6	5	5	1
Ukraine	23	1	0	0	1	6	5	6	2
United Kingdom	23	1	1	1	0	7	6	4	2
United States	25	1	1	1	0	8	5	6	3
Uruguay	8	0	0	0	0	3	3	0	1
Uzbekistan	23	1	1	1	1	6	6	6	2
Venezuela	13	1	0	0	0	5	4	2	1
Yugoslavia (Serbia)	11	1	0	0	0	4	4	0	2
Zambia	17	0	0	0	0	5	4	5	2
Zimbabwe	15	0	0	1	0	2	2	6	2

Averages 17.451 0.618 0.284 0.333 0.265 5.020 4.039 4.441 1.745

Notes to Table A4: RTP = Restrictive Trade Practices, Eff. D = Efficiency Defense, P.I.D. = Public Interest Defense

Appendix Table A5: Ranking Countries by Scope Index

Country (as of 2004)	Score	Country (as of 2004)	Score	Country (as of 2004)	Score
Australia	25	Greece	20	Israel	16
Barbados	25	Latvia	20	Japan	16
Belarus	25	Norway	20	Mongolia	16
Malawi	25	Panama	20	New Zealand	16
United States	25	Slovenia	20	Algeria	15
Hungary	24	South Africa	20	Burkina Faso	15
Korea	24	Tajikistan	20	Senegal	15
Kyrgyzstan	24	Thailand	20	Zimbabwe	15
Indonesia	23	Turkey	20	Bangladesh	14
Mexico	23	Albania	19	Pakistan	14
Spain	23	Belgium	19	Tanzania	14
Ukraine	23	Costa Rica	19	Mali	13
United Kingdom	23	Croatia	19	Mauritius	13
Uzbekistan	23	Czech Republic	19	Papua New Guinea	13
India	22	Germany	19	Peru	13
Jordan	22	Italy	19	Tunisia	13
Kazakhstan	22	Jamaica	19	Venezuela	13
Moldova	22	Poland	19	Colombia	12
Romania	22	Slovak Republic	19	Cote d'Ivoire	12
Sweden	22	Austria	18	Lao PDR	12
Taiwan	22	Canada	18	Bolivia	11
Argentina	21	France	18	Yugoslavia (Serbia)	11
Cyprus	21	Iceland	18	Chile	10
Denmark	21	Ireland	18	El Salvador	10
Estonia	21	Kenya	18	Luxemburg	10
Lithuania	21	Bosnia-Herzegovina	17	Nigeria	10
Namibia	21	Bulgaria	17	China	9
Netherlands	21	Cameroon	17	Uruguay	8
Portugal	21	Macedonia	17	Dominican Republic	7
Russian Federation	21	Malta	17	Philippines	7
Switzerland	21	Morocco	17	Sri Lanka	7
Azerbaijan	20	Zambia	17	Faroe Island	5
Brazil	20	Armenia	16	Guatemala	5
Finland	20	Georgia	16	Paraguay	2

## Appendix: Index Definitions

### **Total Index Score (Minimum possible score 0 – Maximum 30)**

The total index score is simply the sum of the scores for each category (e.g. scope, remedies, private enforcement, etc). Defenses and pro-defendant elements do not contribute to the scores within each category, and likewise do not contribute to the total index score.

### **Scope (0-1)**

*Extraterritoriality:* The applicable law or Act applies to foreign companies and citizens as long as the activity has some effect in the particular country.<sup>47</sup>

### **Remedies (0-3)**

*Fines:* The law allows fines for violations of the applicable Act.

*Prison Sentences:* The law includes criminal violations which are punishable by imprisonment.

*Divestitures:* The law allows the selling of assets or division of the company in response to certain violations.<sup>48</sup>

### **Private Enforcement (0-3)**

*Third Party Initiation:* Third parties (usually those damaged by the violations) can file private lawsuits or initiate an investigation or hearing by the applicable Commission or Council.<sup>49</sup>

*Remedies Available to Third Parties:* Remedies for damaged third parties are provided for in the Act.<sup>50</sup>

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<sup>47</sup> For example, “This Act shall also apply to all economic activities of [foreign companies], if their actions have a substantial effect on the market of Bosnia and Herzegovina . . . .” The Act on Competition, art. 2 (2005) (Bosn. & Herz.) (available [http://www.bihkonk.gov.ba/en/laws/low\\_on\\_competition\\_new.pdf](http://www.bihkonk.gov.ba/en/laws/low_on_competition_new.pdf)) [hereinafter Bosnia Competition Act].

<sup>48</sup> For example, “[T]he [competition council] may require . . . the separation or divestiture of the merged undertakings or assets . . . in order to restore effective competition.” Act LVII of 1996 on the Prohibition of Unfair and Restrictive Market Practices, art. 31 (2005) (Hung.) (available [http://www.gvh.hu/data/pdf/jogi\\_hatter\\_mj\\_tpvt\\_2005nov1\\_a.pdf](http://www.gvh.hu/data/pdf/jogi_hatter_mj_tpvt_2005nov1_a.pdf)) [hereinafter Hungary Competition Act].

<sup>49</sup> For example, “Any person who is aggrieved in consequence of any [prohibited practice] shall have a right of action under this subsection for relief . . . .” Competition Act, §6 (2002) (Ir.) (available <http://www.tca.ie/>).

<sup>50</sup> For example, “A market participant who deliberately or by carelessness violates the provisions . . . of this Law shall cover the losses which . . . have been caused to another market participant or party to a contract.” Competition Law, §21 (2001) (Lat.) (available [http://www.competition.lv/uploaded\\_files/ENG/E\\_likumK.pdf](http://www.competition.lv/uploaded_files/ENG/E_likumK.pdf)).

*Third Party Rights in Proceedings:* Third parties have access to evidence and/or can testify or otherwise participate in proceedings.<sup>51</sup>

### **Merger Notification (0-5)<sup>52</sup>**

*Voluntary:* Companies are encouraged, but not required, to notify the applicable Commission or Council of an intended merger.<sup>53</sup>

*Mandatory:* Companies fitting particular criteria are required to notify the applicable Commission or Council of any intended merger. This gets a score of 3 if fulfilled in order to represent the comparative severity of a mandatory distinction as compared with a voluntary scheme.<sup>54</sup>

*Pre-Merger:* The Commission must be notified before the merger occurs (includes countries where the notification happens somewhat simultaneously with the merger). This gets a score of 2 if fulfilled.<sup>55</sup>

*Post-Merger:* The Commission is notified after the merger (and then often has the power to invalidate the completed merger).<sup>56</sup>

### **Merger Assessment (0-4)**

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<sup>51</sup> For example, “Persons who participate in a case shall have the right: to familiarize themselves with the materials of the case . . . ; to provide evidence, to submit applications, verbal and written explanations . . .” Law of Ukraine on the Protection of Economic Competition, art. 39-40 (2001) (Ukr.) (available <http://www.globalcompetitionforum.org/regions/europe/Ukraine/LEGISLATION.pdf>).

<sup>52</sup> The scoring in this area breaks from a basic dummy variable scheme in order to preserve accurate ordering of the relative severity of different Merger Notification regimes. Under this scoring scheme, a Mandatory Pre-Merger regime receives a 5, a Mandatory Post-Merger regime receives a 4, a Voluntary Pre-Merger regime receives a 3, a Voluntary Post-Merger regime receives a 2, a Voluntary regime that makes no mention of a time requirement is assumed to be “Post-Merger” and therefore receives a 2, and a regime that makes no mention of a notification requirement receives a 0. For construction of the Scope Index, each score was reduced by 1.

<sup>53</sup> For example, “[A]ny person or enterprise, who or which proposes to enter into a combination, may, at his or its option, give notice to the commission . . . disclosing the details of the proposed combination[.]” The Competition Act, art. 6(2) (2002) (India) (available [http://www.competition-commission-india.nic.in/Act/competition\\_act2002.pdf](http://www.competition-commission-india.nic.in/Act/competition_act2002.pdf)).

<sup>54</sup> For example, “Where a merger is proposed each of the undertakings involved must notify the Commission of the proposal in the prescribed manner.” Competition Act, No. 92, art. 44(1) (2003) (Namib.) (available <http://www.globalcompetitionforum.org/regions/africa/Namibia/ACT511.pdf>) [hereinafter Namibia Competition Act].

<sup>55</sup> For example, “A business operator shall not carry out a business merger . . . unless the Commission’s consent is obtained.” Competition Act, B.E. 2542, §26 (1999) (Thail.) (available <http://www.globalcompetitionforum.org/regions/asia/Bangkok/Bangkok%20Act.pdf>).

<sup>56</sup> For example, “A party to a [regulated] merger shall notify the Commission of the proposed merger within 30 days of the conclusion of the merger agreement between the merging parties; or the acquisition by any one of the parties to that merger of a controlling interest in another.” Zimbabwe Amended Competition Act, art. 12 (2001) (Zimb.) (available <http://www.globalcompetitionforum.org/regions/africa/Zimbabwe/Competition%20Amendment%20Act.pdf>).



*Dominance:* The Commission or Council takes into consideration the dominant position or market share that the company will have if the merger occurs.<sup>57</sup>

*Restriction of Competition:* The Commission or Council considers the merger in light of maintaining effective competition, the potential effects on the structure of the market, and possible barriers to entry.<sup>58</sup>

*Public Interest (Pro D):* The Commission or Council considers whether an otherwise impermissible merger may be allowed because it is in the public interest and/or will have benefits or advantages to the consumers.<sup>59</sup>

*Public Interest (Pro Authority):* The Commission or Council has the power to prohibit a merger if they are concerned it runs contrary to public interests such as national security.<sup>60</sup>

*Other:* The Commission or Council considers other issues such as international competitiveness, effects on employment markets, and promoting minority ownership.<sup>61</sup>

*Efficiency Defense:* The Commission or Council may allow an otherwise impermissible merger if it will contribute sufficiently to economic efficiency.<sup>62</sup>

## **Dominance (0-6)**

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<sup>57</sup> For example, “A concentration which creates or strengthens a dominant position in the affected markets . . . shall be declared [illegal].” Law to Provide for the Control of Concentrations between Enterprises for the Purposes of Protection of Effective Competition, No. 22(I), art. 10 (1999) (Cyprus) (available [http://www.competition.gov.cy/competition/competition.nsf/All/5790CF902F3E4AA5C2256F01003CF9A7/\\$file/concentration.pdf?OpenElement](http://www.competition.gov.cy/competition/competition.nsf/All/5790CF902F3E4AA5C2256F01003CF9A7/$file/concentration.pdf?OpenElement)) [hereinafter Cyprus Competition Law].

<sup>58</sup> For example, “The Authority may refuse to approve a merger or acquisition if it is satisfied that the merger or acquisition would substantially lessen competition in Jersey or any part of Jersey.” Competition (Jersey) Law 2005, art. 22(4) (available <http://www.jcra.je/pdf/051101%20Competition-Jersey-Law--2005.pdf>).

<sup>59</sup> For example, “[A decision to make a certain practice illegal] may not be applied to . . . concentrations that contribute to the improvement of production or distribution of goods and services or the promotion of technical or economic progress [while] allowing consumers a fair share of the resulting benefit . . . .” Bosnia Competition Act, art. 7.

<sup>60</sup> For example, “The Commission shall declare a concentration as compatible or incompatible with the requirements of the competitive market after taking into account . . . the interests of intermediate and final consumers . . . .” Cyprus Competition Law, art. 12.

<sup>61</sup> For example, “The Commission may base its determination of a proposed merger on any criteria which it considers relevant [including] the extent to which the proposed merger would be likely to affect the ability of small undertakings, in particular small undertakings owned or controlled by historically disadvantaged persons, to gain access to or to be competitive in any market[.]” Namibia Competition Act, art. 47(2)(f).

<sup>62</sup> For example, “[The Commission may consider] any benefits likely to be derived from the proposed merger relating to research and development, technical efficiency, increased production, efficient distribution of goods or provision of services and access to markets.” Namibia Competition Act, art 47(2)(h).

*Limits Access:* A single dominant firm may not limit the supply of goods to the market or in other ways restrict access to the market by consumers or competitors.<sup>63</sup>

*Abusive Acts:* The Act lists or otherwise indicates acts that would constitute an impermissible abuse of a dominant position.<sup>64</sup>

*Price Setting:* It is impermissible for a single firm to arbitrarily or unfairly set the price of a good by taking advantage of its dominant position.<sup>65</sup>

*Discriminatory Pricing:* A single dominant firm may not impose different prices for the same goods or services for different customers.<sup>66</sup>

*Resale Price Maintenance:* The Act does not allow single firms to set the price at which its customers will ultimately sell their product to consumers.<sup>67</sup>

*Obstacles to Entry:* A dominant firm is prohibited from imposing various restrictions or coercive practices that make it very difficult for competitors to enter the market or increase their market share.<sup>68</sup>

*Efficiency Defense:* An otherwise impermissible act is excused if it substantially contributes to economic efficiency or to the public good.<sup>69</sup>

### **Restrictive Trade Practices (0-8)**

*Price Fixing:* A cartel or group of companies is not allowed to attempt to set the price for their product in the market.<sup>70</sup>

*Tying:* A group of companies is not allowed to condition contracts on buying additional products that are not directly connected to the product that is the subject of the contract.<sup>71</sup>

<sup>63</sup> For example, “It shall be prohibited . . . to limit production, distribution or technical development to the prejudice of consumers[.]” Hungary Competition Act, art. 21.

<sup>64</sup> For example, “It shall be prohibited to abuse a dominant position . . .” *Id.*

<sup>65</sup> For example, “It shall be prohibited . . . to set unfair purchase or selling prices . . .” *Id.*

<sup>66</sup> For example, “It shall be prohibited . . . in the case of transactions which are equivalent in terms of their value or character to discriminate, without justification, against trading parties including in relation to the application of prices, periods of payment, [etc.]” *Id.*

<sup>67</sup> For example, “[Illegal acts include] any agreement, decision, or concerted practice which . . . involves a practice of minimum resale price maintenance[.]” Namibia Competition Act, art. 23(3)(d).

<sup>68</sup> For example, “[A dominant Enterprise] is prohibited from abusing this Dominant Position in order to prevent, limit, or weaken competition including . . . [performing an] activity or action which leads to setting barriers of entry of other Enterprises to the market . . .” The Competition Law, No. 33, art. 6(b) (2004) (Jordan) (available

<http://www.internationalcompetitionnetwork.org/media/archive0611/mergerjordanlaw.pdf>).

<sup>69</sup> For example, “The Commission may . . . grant an exemption for [an] agreement [if] . . . the agreement results or is likely to result in benefits to the public [such as] by contributing to greater efficiency in production or distribution; by promoting technical or economic progress [etc.]” The Fair Competition Act, art. 12 (2003) (Tanz.) (available <http://www.parliament.go.tz/Polis/PAMS/Docs/8-2003-2003.pdf>).

<sup>70</sup> For example, “[Agreements involving] the direct or indirect fixing of purchase or selling prices or other business terms and conditions [are prohibited.]” Hungary Competition Act, art. 11.

*Market Division:* A group of companies cannot agree to divide or allocate the market by a particular geographic, demographic, price-defined, or otherwise-defined characteristic.<sup>72</sup>

*Output Restraint:* A group of companies is not allowed to agree to limit the overall rate of production or amount of products made available to the market.<sup>73</sup>

*Market Sharing:* A group of companies cannot agree to share a certain market by not competing with each other for business or customers.<sup>74</sup>

*Eliminating Competitors:* The law prohibits acts by a group of companies that have the purpose and/or effect of reducing the amount of competition in the market.<sup>75</sup>

*Collusive Tendering/Bid-Rigging:* It is illegal for a group of firms to agree not to bid at market price for a certain product in order to manipulate the market price of that product.<sup>76</sup>

*Supply Refusal:* A group of companies cannot agree not to sell their products to certain other companies or groups of companies for arbitrary reasons.<sup>77</sup>

*Efficiency Defense:* An otherwise impermissible practice may be allowed if it contributes significantly to economic efficiency or to the public good.<sup>78</sup>

<sup>71</sup> For example, “[M]aking the conclusion of contracts subject to the acceptance of obligations which, by their nature or according to commercial usage do not belong to the subject of such contracts [is prohibited.]” *Id.*

<sup>72</sup> For example, “Prohibited are all agreements between economic subjects, associations and concerted practices relating to . . . the division of markets or sources of supply of goods and services[.]” Bosnia Competition Act, art. 4(c).

<sup>73</sup> For example, “Agreements or concerted practices [relating to] the limitation or control of production, distribution, technical development or investment [are prohibited.]” Hungary Competition Act, art. 21.

<sup>74</sup> For example, “Agreements or concerted practices [relating to] the allocation of markets, exclusion from sales, or restriction of the choice of marketing possibilities [are prohibited.]” *Id.*

<sup>75</sup> For example, “Agreements or concerted practices between undertakings . . . which have as their object or potential or actual effect the prevention, restriction, or distortion of competition, shall be prohibited.” *Id.*

<sup>76</sup> For example, “[T]he collusion of competitors during the bidding process [is prohibited.]” Hungarian Competition Act, art. 21 (2004) (Hung.) (available [http://www.gvh.hu/data/pdf/jogi\\_hatter\\_mj\\_tpvt\\_2003aug1\\_a.pdf](http://www.gvh.hu/data/pdf/jogi_hatter_mj_tpvt_2003aug1_a.pdf)).

<sup>77</sup> For example, “[C]oncerted refusals to supply goods or services to potential purchasers [are prohibited.]” Malawi Competition and Fair Trading Bill, §33(3)(f) (1998) (Malawi) (available <http://r0.unctad.org/en/subsites/cpolicy/Laws/malawi.pdf>).

<sup>78</sup> See *supra* note 25.

*Efficiency Defense*: An otherwise impermissible practice may be allowed if it contributes significantly to economic efficiency or to the public good.<sup>78</sup>

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<sup>78</sup> See *supra* note 25.