

# Antitrust Policies and Profitability in Non-Tradable Sectors

## Online Appendix

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### A. Online Appendix – Data Sources and Description

#### A.1. Orbis Dataset

We collect the universe of firms contained in Orbis (Bureau van Dijk, BvD) from 2006 to 2015<sup>1</sup>. We refer to the 2016 version of the dataset, we got access in September 2017. The Orbis dataset reports financial statements for each firm ever registered in the each period.<sup>2</sup> The data includes: a unique firm identifier, country code (ISO, 2 digits), NACE Rev. 2 main section code and yearly data on operating revenue, net income, total assets, profit margin, price earning ratio, number of employees, gross sales, net sales, financial revenues and financial expenses.<sup>3</sup> The profit margin is defined (see the Orbis Handbook) as Profit/Loss before Tax and External Items over Operating Revenue (times 100).<sup>4</sup> The original dataset contains roughly 160 million of observations. However, only 130 million of these report a sector code.

#### SECTORS

We assign each firm to one sector using the NACE Rev. 2 main section code reported in Orbis as the reference (we will refer to this as a firm’s “sector” unless otherwise specified). The list of sectors is in Appendix Table C.1. We divide sectors into *tradable* and *non-tradable*. In the baseline, tradable sectors are: Agriculture, forestry and fishing (A), Mining and quarrying (B) and Manufacturing (C).

**Missing NACE codes** If the NACE Rev. 2 main section code is missing we rely on the following codes present in the data with the following order giving the hierarchy used in filling the gaps:

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<sup>1</sup>In 2015 there are only 109,043 firms with non missing profit margin. In all other years there are at least 5.5 millions

<sup>2</sup>It is not possible to distinguish firms going out of business from firms simply not reporting data

<sup>3</sup>Operating revenue, net income, total assets, gross sales, net sales, financial revenue and financial expenses are reported in thousands of US Dollars. Profit margin in percentage points

<sup>4</sup>Profit/Loss before Tax and External items is the sum of Operating Profit (which is equal to Gross Profit, *i.e.* Operating Revenue minus Costs of Goods Sold, minus Other Operating Expenses) and Loss with Financial Profit/Loss (which is equal to Financial Revenue minus Financial Expenses)

- 1) NACE Rev. 2 Core code (4 digits). We convert the 4 digits NACE codes to the main section code using the first two digits as shown in Appendix Table C.1
- 2) NACE Rev. 2 Primary code(s).
- 3) NACE Rev. 2 Secondary code(s).
- 4) NAICS 2012 Core code (4 digits). We map the 4 digit NAICS 2012 codes to NACE Rev. 2 4 digits code (and then we are able to assign automatically the corresponding NACE Rev. 2 main section). The source of the mapping tables is Eurostat. If more than one NAICS code is assigned to more than one NACE Rev. 2 main section then we conduct manual checks.
- 5) NAICS 2012 Primary code(s).
- 6) NAICS 2012 Secondary code(s).
- 7) US SIC Core code (3 digits). We map the 3 digits US SIC codes (1987 version) to NAICS 2007 codes and then to NAICS 2012 codes (above mapping then applies). Source: US Census. Going through the NAICS codes is necessary as a direct mapping from US SIC to NACE Rev. 2 does not exist. Manual checks were also carried on here to ensure that to each US SIC code only one NACE Rev. 2 main section
- 8) US SIC Primary code(s).
- 9) US SIC Secondary code(s).

**Creating a unique NACE code** By construction, the original dataset has repeated observations for the same firm whenever the firm operates in more than one sector (either it was a main, primary, or secondary sector). Most of the time, the only information that varies is the sector code reported while data from financial statements are constant. Having converted everything, we delete duplicates in NACE Rev. 2 main section. However, some duplicates may remain whenever different NACE Rev. 2 main section codes are reported. As a first step, we look at which sector represents the biggest share of sales. If there are duplicates (mainly due to missing information on sales), we keep the observation with the smallest number of missing observations in the financial statements. If this procedure does not resolve all cases of duplication, we randomly select among the duplicated codes for that observation.

**The Mian and Sufi division between tradable and non-tradable sectors** As a robustness check in Table 2, following Mian and Sufi (2014), we also include Information and communication (J) among the *tradable* sectors (the *Mian and Sufi* definition). Mian and Sufi (2014) classify 294 4 digit 2012 NAICS industry codes as non-tradable, tradable, construction or other industries. They also report the percentage of the entire 2007 US labour force represented by each industry. We match the 2012 NAICS 4 digits code to NACE Rev. 2 4 digit codes and sum tradable and total labour force by NACE Rev. 2 main section code. We compute the relative share of tradable within each NACE Rev.

2 main section code. Sectors A, B, C, J are the only four sectors with positive shares of the labor force in tradable sectors according to the Mian and Sufi (2014) definition (6.3%, 60%, 86% and 7.2% respectively). Computing the number of industries classified as “tradable” in each NACE Rev. 2 main section code delivers similar results. In particular: 25% of industries in code A, 80% of code B, 87% of code C, 5.9% of code J are categorized as tradable by Mian and Sufi (2014).

**Data Cleaning** The original data contains some extreme outliers. We therefore used a trimmed version of all variables. Specifically, we trimmed the top and bottom 1%.<sup>5</sup> This trimming exercise is performed at a country-sector level in the main sample.

#### THE CROSS-SECTION SAMPLE

The unit of analysis is a country-sector. For the main analysis, we use the average profit margin constructed by taking the average profit margin of all firms in a country-sector over a ten year window. In this exercise, trimming is performed at a country-sector level. We refer to this as the *mean* concentration measure.

To ensure that these concentration measures are representative of the country-sector firm composition, we require a minimum number of observations for the relevant country-sector for it to be included in the data. The baseline cutoff is at 20. However, as a robustness check, we also consider 0 (i.e. no restriction at all), 10, 30, 40, 50, 200 or 3000 firms per country-sector.<sup>6</sup> The baseline cross sectional sample at a country-sector level represents around 13 million firm-level observations.<sup>7</sup>

Appendix Figure C1 reports the number of firms with non-missing profit margin data disaggregated by continent. This shows that most of our firms are not coming from developed countries. We have a significant number of firms located in Asia, Eastern Europe and Latin America, and relatively few, from North America.

Appendix Figure C2 reports the number of firms in each sector. This shows the importance of focusing firms outside manufacturing, in contrast to much work on level behavior. We will also be exploiting data from some large sectors such as retail and construction.

Appendix Figure C3 reports the total number of sectors available for each country averaged by continent when we use our requirement of at least 20 firms per country-sector. It shows that 58 (out of 123) countries have more than 10 sectors with more than 20 firms. Most of them are in Western Europe, Eastern Europe, and North America. This graph, combined with Appendix Figure C1, suggests that some countries (*i.e.* look for example at Latin America) may have many firms reported, but most of them will come from the same sectors, rather than being spread equally among many.

Appendix Figure C4 reports the percentage of country-sectors with more than 20 firms. It shows that almost every country has at least 20 firms in the Financial and Insurance

<sup>5</sup>Results not trimmed and trimming top and bottom 5% are presented as robustness in Appendix Table D.8, no differences arise

<sup>6</sup>As we first compute the average of firms balance sheets it means that we will need at least 20 firms to have at least one balance sheet data reported in the ten years period

<sup>7</sup>Just to recall all the restrictions imposed: we drop all firms not reporting any sector code, we drop all the firms in the top/bottom 1% of the distribution of the variable of interest (*e.g.* profit margin, assets, ...) at country-sector, we drop all firms not part of a country-sector reporting data for the variable of interest for at least 20 firms

sector. In addition, 10 sectors (out of 21) have more than 50% of our sample countries represented.

**Alternative Aggregation** As an alternative way of aggregating the data, we compute each concentration measure at a country-sector-year level before averaging over the ten years (we will call this variable the *average* concentration measure). Results using this alternative aggregation approach (or yearly concentration measures) are similar to the baseline as we show in Appendix Tables D.4 and D.5 below.<sup>8</sup>

**The HHI Index as a Measure of Concentration** We have also computed Herfindahl-Hirschman Index (HHI) for each country-sector using the total assets and gross or net sales from Orbis. We prefer to use HHI based on total assets for two main reasons: i) when looking at non-tradable sectors, it is not at all straightforward how to consider sales and ii) the sales variables in Orbis contain many missing observations. To mitigate this problem we have tried imputing gross (or net) sales based on the relationship between this variable and total assets. Specifically, we regress gross sales on total assets, sector fixed effects and country $\times$ year fixed effects (or at country fixed effects when we predict values of averages over ten years). Predicted values are then imputed only if the original variable (gross sales in the example) is missing. Negative predicted values are also excluded.

**Capturing Entry and Exit** In the original Orbis dataset, we are unable to observe entry and exit. Specifically, we cannot distinguish whether missing values are due to firm not yet existing/ceasing to exist. We therefore proceed as follows:

We define entry in the following way: a firm enters in year  $t$  if we start observing data from the financial statement in year  $t$ . We apply this procedure for the 2008-2015 period<sup>9</sup>.

We define exit in the following way: a firm exits our sample in year  $t$  if we do not observe data from the financial statement in any of the following years. We apply this procedure for the 2006-2012 period.<sup>10</sup>

Since we are only interested in firms reporting data, we follow these procedures before trimming the variables in the data from financial statements. We compute the share of firms entering (exiting) for each year-country-sector over the total number of firms in the country-sector. Finally, we compute the average entry (exit) share of firms for each country-sector. In the analysis, we restrict to country-sectors with at least 20 firms reporting data from their financial statements.

## A.II. The Antitrust Measure

We use the *Total Scope Index Score (Scope Index)* from Hylton and Deng (2007).<sup>11</sup> They code antitrust laws and policies around the world (112 countries in the most recent

<sup>8</sup>Defining the cutoff to have the country-sector included in the sample, is straightforward: we include the country-sectors with a number of observations greater than or equal to the cutoff. If we consider the average of these yearly concentration measures we compute the average number of firms used to compute the yearly concentration measures. Trimming top and bottom 1% is performed at country-sector-year

<sup>9</sup>Applying the same procedure in 2006, first year of data, and 2007 may result in wrong entry assignments

<sup>10</sup>Applying the same procedure in 2013-2015 may result in wrong exit assignments. We exclude three years when looking at firm exit because 2015 reports a substantially lower number of firms

<sup>11</sup>The most up to date dataset can be found here. We access the data in May 2018

version) in order to create a metric of antitrust laws. This is constructed by examining various components of competition law and assign a score depending on how national laws govern conduct, penalties or enforcement.<sup>12</sup> The total index score is the sum of the scores for each sub-category. The minimum value is 0 while the maximum is 30. This is mainly a *de jure* index and does not measure the effectiveness of these laws. Section II of Hylton and Deng (2007) discusses the methodology at length.<sup>13</sup> We average the index of our ten year period (2006-2015).

Figure C5 shows the geographical distribution of this index.

It gives a sense of the country coverage and areas of the world where antitrust laws are rated to be stronger or weaker. There are notable countries without data, including most of sub-saharan Africa.

We show in the Appendix Table C.2, that the antitrust index is correlated in a common sense way with a range of variables which represent the quality of institutions. Specifically, we run the following regression:

$$(A.1) \quad A_c = \alpha + \chi Z_c + \varepsilon_c$$

where  $A_c$  is the *Total Scope Index Score* of Hylton and Deng (2007) and  $Z_c$  is variously: log of GDP per capita, the Economic Freedom, Civil Liberties and Political Rights Indices from Freedom House, the democracy and executive constraints measures from PolityIV, and the Rule of Law Index from the World Justice Project. Appendix Table C.2 shows that countries with higher GDP are classified, on average, as having a better antitrust regime according to Hylton and Deng (2007). The index is positively correlated with economic freedom but negatively correlated with political and civil rights. Countries that are more democratic and have stronger executive constraints also have a higher score on the antitrust index. And stronger rule of law is positively correlated with the index. Although these are not causal relationships, it suggests that there are important sources of country-level unobserved heterogeneity that are likely to affect the antitrust regime, thereby reinforcing the need to include country fixed effects in all our regressions.

To supplement this index, we use Bradford et al. (2019) to measure the budget (in USD) allocated by each country for antitrust agencies as an alternative measure for antitrust policies<sup>14</sup>. This is available only up to 2010. However, we will use it alongside the scope index as robustness check in Table 2. To ensure a valid comparison with other results, we will average the concentration index measures over the period 2006-2010.

We also run the analysis using the Competition Law Index (*CLI*) from Bradford and

<sup>12</sup>Categories considered Territorial Scope, Remedies, Private Enforcement, Merger Notification, Merger Assessment, Dominance, and Restrictive Trade Practices.

<sup>13</sup>A special case is represented by Europe. Hylton and Deng (2007) present both regulation from the European Commission and for each country member of the EU, reporting the national antitrust law and the national antitrust law integrated with EU regulation. We ignored the purely European Commission law and whenever there was a conflict between purely national and national with EU regulation antitrust law (*i.e.* both reported in the same year) we had the latter to dominate. We consider measures of European-wide Antitrust policies in Appendix Table D.5, in which we consider the European Union to a single country with similar results to our baseline specification.

<sup>14</sup>Data can be accessed [here](#) (Comparative Competition Enforcement Dataset, accessed August 2019).

Chilton (2018)<sup>15</sup>. This is similar to the *Scope Index* and covers a larger group of countries. However, it is also only available up to 2010. Results (available upon request) show a negative, although insignificant correlation between this and our measure of profitability in a specification similar to column (3) of Table 2. To ensure a valid comparison we average the concentration index measure only over the period 2006-2010 when we do this.

In an effort to capture the effectiveness of antitrust policies we looked at the yearly Global Competitiveness Report from World Economic Forum<sup>16</sup>. We particularly focus the Executive Opinion Survey question which asks respondents: "In your country, to what extent does anti-monopoly policy promote competition?" where the answer can be from 1 (does not promote competition) to 7 (effectively promotes competition).<sup>17</sup> We compute an average for this variable over the ten years period of analysis (2006-2015). Results (available upon request) show a negative, although insignificant, correlation in our main specification akin to Column (3) of Table 2 when using this alternative indicator of antitrust policy.

#### A.III. Other variables

We have also collected a range of country-level variables to use in our analysis: GDP per capita, PPP (constant 2011 international \$), (source: World Bank); Summary index of Economic Freedom of the World, (source: Fraser Institute); Civil Liberties Index and Political Rights Index, (source Freedom House); Polity IV and Executive Constraints Index, (source: Centre for Systemic Peace); Overall score among Rule of Law, (source: World Justice Project). For all these variables we compute the average over the ten years period of analysis (2006-2015).<sup>18</sup>

#### A.IV. Summary Statistics

Summary statistics on the distribution of profitability, concentration, and the antitrust index are given in Table 1. This shows how these variables vary within country across sector and across country within sector. Panel A gives the average profit margin both overall and disaggregated using our tradable/non-tradable distinction. The average profit margin in non-tradable sectors is higher with a mean of 7.68 (standard deviation 9.47) compared to a mean of 5.18 (standard deviation 6.63) for the tradable sectors. These raw data are consistent with Hypothesis 1 based on the idea that tradable sectors are more exposed to international trade. The between country variation is somewhat greater than the within country variation suggesting that country-specific factors are at work in determining these differences. Panel B shows that the HHI measure based on assets is

<sup>15</sup>Data can be accessed [here](#) (Comparative Competition Law Dataset).

<sup>16</sup>Each year Global Competitiveness Report from World Economic Forum, see for example 2015-2016 version [here](#)

<sup>17</sup>Nicholson (2008) looks at the relationship between this *De Facto* measure and Hylton and Deng (2007)

<sup>18</sup>With the exception of Rule of Law index available only in 2012, 2014 and 2015. Sources: GDP per capita, PPP (constant 2011 international \$): World Bank provides now data at constant 2017 international [here](#) (accessed April 2018). Link reported refers to the 2017 international as no link for constant 2011 is available. Summary index of Economic Freedom of the World: [here](#) (accessed June 2018). Civil Liberties Index and Political Rights Index: [here](#) (accessed June 2018). Polity IV and Executive Constraints Index: [here](#) (accessed April 2018). Overall score among Rule of Law: [here](#) (accessed June 2018)

also higher on average for the non-tradable sectors. It is 4.87 (standard deviation 9.02) for the non-tradable sectors while for the tradable sectors it is 4.03 (standard deviation 8.83).

In Panel C, we give the fraction of country-sectors in our sample that are classified as tradable according to our baseline definition and that used in Mian and Sufi (2014). Our definition suggests that 16% of country-sector observations are in the tradables sector while using the Mian and Sufi (2014) definition, it is 22%. Summary statistics in Table 2 are consistent with our sample being composed of 10.5 million firms operating in the non-tradable sector out of a total of 12.8 millions firms. It means that tradable sectors represent 17.9% (21.8% using the Mian and Sufi (2014) definition) of our sample. We conclude that most firms are not exposed to international trade and that looking at the competitive impact of trade therefore gives only a partial picture of factors driving firm performance and profitability.

Finally, in Panel D, we report the means and standard deviations of our two core antitrust variables. The wide range of differences in the expenditure measure are particularly striking.

Appendix Table C.3 presents summary statistics for additional key variables used in the analysis. HHI gross sales and HHI net sales have been computed after trimming the variable of interest in the sample at 1% at country  $\times$  sector level. We are also restricting the sample to country-sectors with at least 20 firms reporting data in the variable of interest. In Panel B, we restrict the attention to country-sectors with at least 20 firms reporting average profit margin.

### B. Online Appendix – Additional Results and Robustness

In this section, we present some additional results and a range of robustness checks.

**Entry and exit** We investigate one of the many possible mechanisms behind the negative relationship between antitrust, profits, and concentration. Our main hypothesis is that antitrust policy may induce competition by lowering the regulatory burden and fixed costs. A corollary of this may imply that antitrust induces a differentially positive effect on entry and exit in non-tradable sectors compared to tradable ones. As a result, the following equation verifies whether antitrust is associated with the firm entry and exit (measured as described in Appendix, section A.A.I). We regress  $Entry_{cs}$ , which measures the average entry of firms in country  $c$  and sector  $s$  on an interaction between the antitrust index,  $Antitrust_c$ , and the dummy taking unit value for sectors classified as non-tradable,  $Non - Tradable_s$ , including country and sector fixed effects. The same regression is also presented for the average share of exiting firms:

$$(B.1) \quad Entry_{cs} = \beta_1 Antitrust_c \times Non - Tradable_s + \delta_c + \sigma_s + \epsilon_{cs}.$$

Column (1) of Appendix Table D.1 shows that one standard deviation higher antitrust index is associated with a 6.78 percent increase in the standard deviation of the share of firms entering in country  $c$  and sector  $s$ . This is statistically significant, corresponding to an increase of 2.2% relative to the mean. Changes in antitrust policy do not correlate well with the exit of firms, as shown in Column (2). This is true both in terms of significance

and the point estimate is an order of magnitude smaller than for entry. The finding in Column (1) is consistent with antitrust policy lowering barriers to entry, which may increase the likelihood of new firms entering (or existing firms growing in size). At the same time, the lack of response on exit is in line with antitrust policy leading to lower profits, but insufficiently so to drive firms from the market.

**Alternative HHI** We consider alternative concentration measures and verify their robustness with our main results. Column (6) of Table 2 shows that the HHI based on assets, is negatively correlated with the antitrust in non-tradable sectors. We repeat this analysis in Appendix Table D.2 by using two different concentration measures: a) the HHI based on gross sales in Column (1) and b) the HHI using net sales in Column (2). The results of Appendix Table D.2 are in line with Table 2 both in terms of sign and magnitude.

**Cutoff** We modify the sample threshold defining our sample as we did in Table 4, Columns 1-3. In Section 5 of the paper, we considered only country-sector cells containing at least 20 firms and disregard all country-sector cells with a smaller number of firms. This generates comparable cells across countries and sectors. Appendix Table D.3 replicates our baseline specification presented in the Column (3) of Table 2, including country and sector fixed effects and only changes the minimum number of firms necessary to include a country-sector cell with cutoffs between 0 and 3000 firms. The results in all columns are statistically indistinguishable from those in Table 2. The loss of statistical significance in columns further to the right is most likely related to power issues.

**Alternative samples** We show that our results are robust to different sampling strategies as we did in Table 4, Columns 4-6. Appendix Tables D.4 and D.5 explore the specification presented in Column (3) of Table 2 on the sample for the years 2006-2015. In Column (1), we verify that our main result is unaffected if we change the timing of our sample and take the average profit margin over the 2006-2010 period to make it comparable with column (5) of Table 2. Column (2) shows that our main result is unchanged if we analyze the average of yearly average profit margin at country-sector level, rather than first averaging profit margin for each firm over the ten years and then average by country-sector. We then repeat the analysis by defining our sample as the mean over a single year and verify that the results are statistically indistinguishable from the core results. Hence, Columns (3) to (8) of Appendix Table D.4 report our main result for single years: from 2006 to 2011. Appendix Table D.5 reports the same coefficients in a year-by-year fashion from 2012 until 2015 in Columns (1) to (4). The latter is the only year that shows a marginally insignificant estimate, but with a much smaller sample: the number of country-sector cells in 2015 is 167, compared to roughly 900 for all other years, and around 1.5% of the firms reporting data, compared to other years.

To ensure that including 2015 does not alter our results, we look at Column (3) of Table 2 for the years 2006-2014. The results are identical.

We now allow the EU to be treated as a single country; the results are in Appendix Table D.5. Here, we calculate the average profit margin (and the HHI index) treating all EU countries as a single country. The countries considered in the EU in 2006 (the first year of data) are: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, France, Fin-

land, Germany, Hungary, Italy, Ireland, Latvia, Lithuania, Luxembourg, Greece, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, and Sweden. Bulgaria and Romania (which joined in 2007) and Croatia (which joined in 2013) are excluded. Columns (6), (7) and (8) replicate the specifications in Columns (3), (5) and (6) of Table 2. The basic findings are robust to aggregating the EU into a single entity. However, the coefficient in Column (6) is not significant although we cannot reject the coefficient being the same as Column (3) in Table 2. In addition to the results shown, we averaged (weighting by size of country-sector) each country-sector within EU (both for our antitrust indexes and the concentration measures) and the results are almost identical.

**Weighting Profit Margin by Operating Revenues** This sub-section shows that our results are almost identical if, when computing the average profit margin at country-sector, we consider a weighted average by operating revenues instead of the simple average. Results are shown in Appendix Table D.6 in which we replicate Columns (1) to (5) of Table 2. Only Column (5) is not significant although we cannot reject the coefficient being the same as Column (5) in Table 2. All the other coefficients of interest are very similar and, if anything, larger.

**Data quality** Here we explore whether our results depend on the poor data quality of some countries. Column (7) of Table 4 offers one important robustness check: it restricts the sample to countries that have at least 19 sectors with sufficient data to be included (where 20 is the maximum number of sectors possible). This serves as a check on data quality since some countries may have limited data in Orbis which leads to the exclusion of entire sectors. We now verify that this is not a problem in our setting. Appendix Table D.7 shows a further robustness check based on Column (7) of Table 4 when the minimum number of sectors per country is varied from 5 to 20. The point estimate is unchanged as this threshold moves from 5 in Column (1), to 10 in (2), to 15 in (3) and to 20 in (4). As in previous tests, a higher threshold leads to a small number of observations and firms, weakening the statistical precision but leaving the point estimate unchanged.

**Various robustness** Additional robustness checks are in Appendix Table D.8. Column (1) presents results from a weighted regression, with the weight given by the number of firms in the country-sector with a non-missing profit margin<sup>19</sup>. The next two columns consider different “trimming” strategies. In our baseline estimates, we had trimmed the top and bottom 1% of firms, in line with much of the literature that uses Orbis data. Our findings are robust to not doing any trimming (Column (2)) and to more restrictive trimming at 5% in Column (3). In Column (4), we also verify that our results are robust to a different way of trimming by removing the top/bottom 1% of concentration measures. Columns (5) and (6) vary the way in which we cluster our standard errors. Column (5) has unadjusted standard errors and Column (6) clusters at a country-sector level (equivalent to robust standard errors).

<sup>19</sup>In this case we want to give more relevance to country-sectors with more firms represented. This is different from what we do in Appendix Table D.6 where we are giving more weight to larger firms when computing average profit margin at country-sector level.

### C. Online Appendix – Additional Tables and Figures

TABLE C.1—NACE REVISION 2 CODES

<i>Main section</i>	<i>Description</i>	<i>2 digits</i>
A	Agriculture, forestry and fishing	01 – 03
B	Mining and quarrying	05 – 09
C	Manufacturing	10 – 33
D	Electricity, gas, steam and air conditioning supply	35
E	Water supply; sewerage, waste management and remediation activities	36 – 39
F	Construction	41 – 43
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	45 – 47
H	Transportation and storage	49 – 53
I	Accommodation and food service activities	55 – 56
J	Information and communication	58 – 63
K	Financial and insurance activities	64 – 66
L	Real estate activities	68
M	Professional, scientific and technical activities	69 – 75
N	Administrative and support service activities	77 – 82
O	Public administration and defence; compulsory social security	84
P	Education	85
Q	Human health and social work activities	86 – 88
R	Arts, entertainment and recreation	90 – 93
S	Other service activities	94 – 96
T	Activities of households as employers; undifferentiated goods and services producing activities of households for own use	97 – 98
U	Activities of extraterritorial organisations and bodies	99

*Note:* We report Level 1 Sectors in NACE Rev 2.

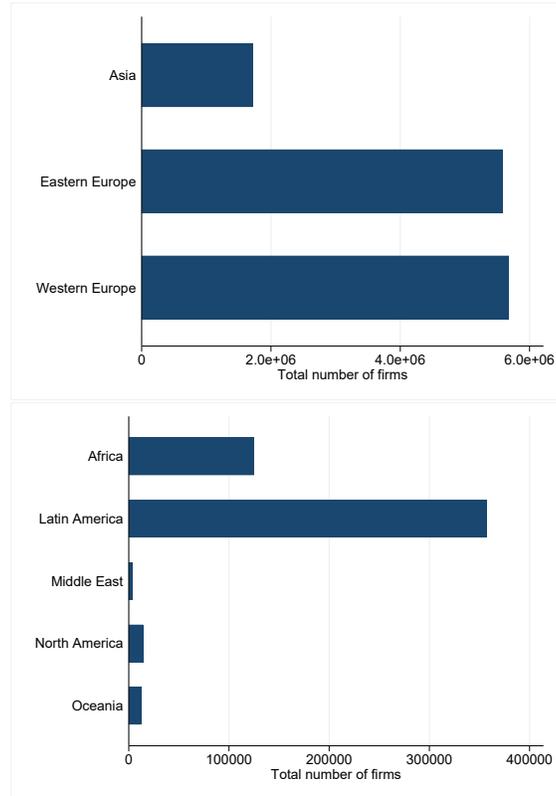


FIGURE C.1. NUMBER OF FIRMS BY CONTINENT

*Note:* Number of firms with non-missing profit margin in at least one of the ten years of sample period (2006-2015) by continent. The sample is as defined in Table 1, Panel A.

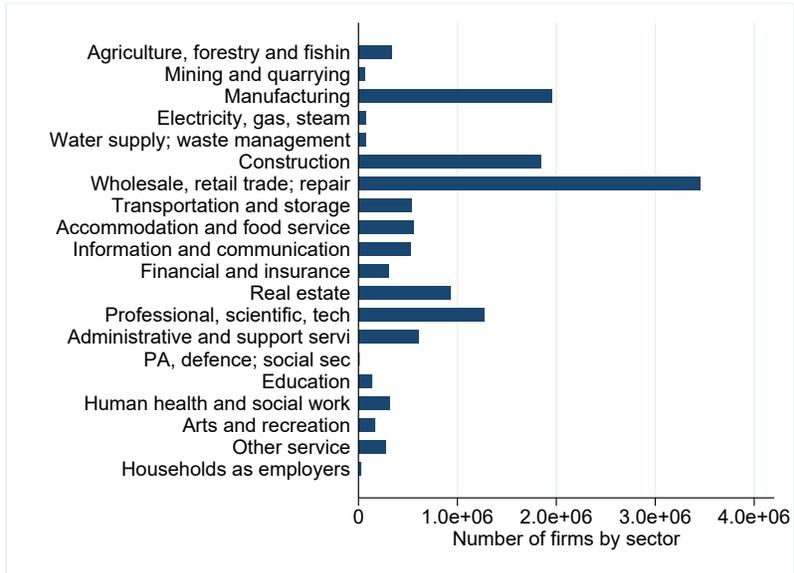


FIGURE C.2. NUMBER OF FIRMS BY SECTOR

*Note:* Number of firms with non-missing profit margin data in at least one of the ten years of sample period (2006-2015) by sector. The sample is as defined in Table 1, Panel A.

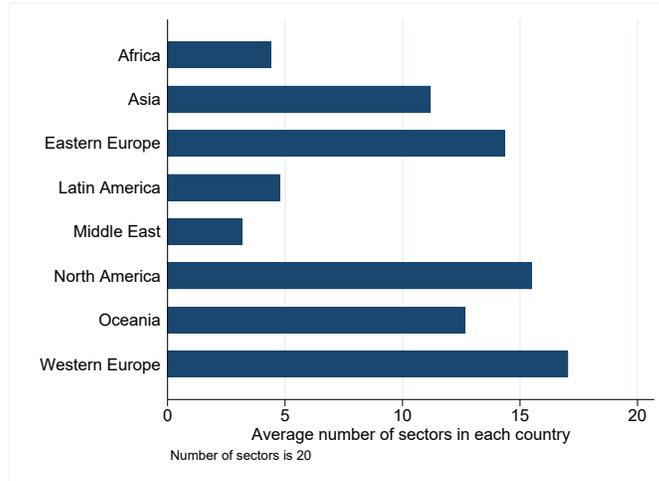


FIGURE C.3. AVERAGE NUMBER OF SECTORS BY CONTINENT

*Note:* Average number of sectors in each country averaged by continent. Sample defined as in Table 1, Panel A.

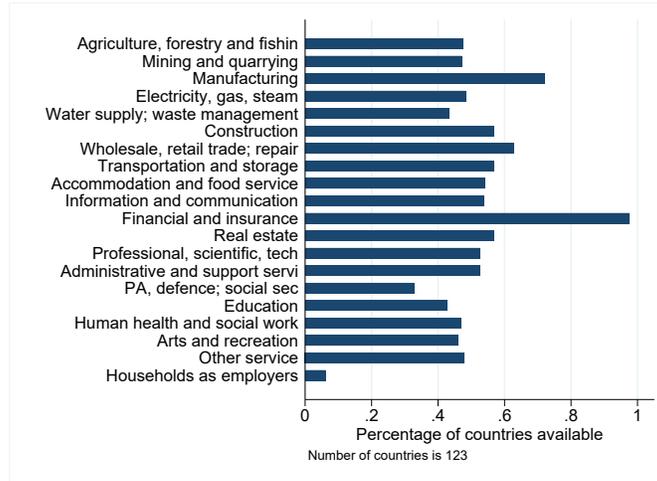


FIGURE C.4. PERCENTAGE OF COUNTRIES WITH AT LEAST 20 FIRMS IN THE SECTOR

*Note:* Percentage of countries in each sector. Sample defined as in Table 1, Panel A.

TABLE C.2—ANTITRUST INDEX

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Antitrust Index (std)			
Institutional Index - $\chi$	0.438 (0.122)	0.248 (0.117)	-0.375 (0.109)	-0.326 (0.101)	0.243 (0.107)	0.303 (0.110)	0.354 (0.106)
Observations	107	106	108	108	104	104	83
R-squared	0.132	0.053	0.120	0.096	0.048	0.071	0.125
N countries	107	106	108	108	104	104	83
Mean dependent variable	20.06	19.99	20.17	20.17	20.11	20.11	20.29
St. Dev. dependent variable	4.66	4.63	4.63	4.63	4.69	4.69	4.78
Institutional variable	Log GDP pp	Economic Freedom	Civil Liberties	Political Rights	Polity IV	Executive Constraints	

*Note:* This table presents OLS estimates using the specification in equation 4. Standard errors are robust standard errors and reported in parentheses. The dependent variable Antitrust Index is an index measuring the intensity of antitrust activities, as defined by Hylton and Deng (2007). The Institutional Index variable represents various country characteristics, see Appendix Section A.A.III for details and sources.

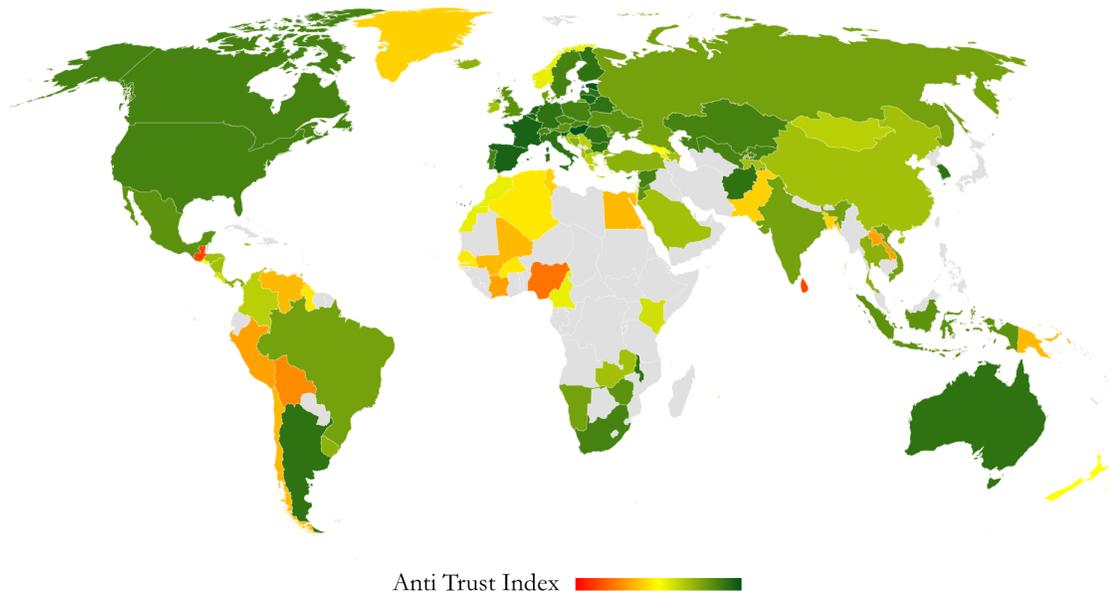


FIGURE C.5. GEOGRAPHICAL DISTRIBUTION SCOPE INDEX (AVERAGE 2006-2015)

*Note:* The geographical distribution Scope Index (averaged for the period 2006-2015). The red areas represent a low value of the antitrust index (minimum equals to 5) while the green areas represent a high value of the antitrust index (maximum equals to 27). We do not have data for grey areas.

TABLE C.3—ADDITIONAL SUMMARY STATISTICS

	Obs	Mean	Sd	Min	Median	Max
<i>Panel A</i>						
Number of firms reporting profit margin	1,224	11,023	40,800	20	785	906,758
Number of firms reporting total assets	1,245	16,645	54,686	20	1077	977,687
HHI Gross Sales	1,115	3.56	6.40	0.00	0.47	78.71
Number of firms reporting gross sales	1,115	10,105	34,323	20	568	604,246
HHI Net Sales	1,116	3.56	6.38	0.00	0.46	78.71
Number of firms reporting net sales	1,116	10,186	35,324	20	570	656,511
Pct new firm	1,623	0.09	0.03	0.01	0.10	0.13
Pct closed firm	1,592	0.04	0.03	0.00	0.03	0.14
<i>Panel B</i>						
GDP per capita	1,209	27,706	17,433	1524	23782	121,724
Economic Freedom	1,183	7.20	0.66	3.91	7.28	9.03
Civili Liberties	1,193	2.24	1.50	1.00	1.70	7.00
Political Rights	1,193	2.30	1.82	1.00	1.20	7.00
Polity IV	1,140	17.02	4.96	0.00	19.00	20.00
Executive Constraints	1,140	6.16	1.46	1.00	7.00	7.00
Rule of Law (2012, 2014, 2015)	984	0.64	0.14	0.33	0.61	0.88

*Note:* The unit of analysis is country-sector. In Panel A we consider the country-sectors with at least 20 firms with non missing financial statements data to compute the variable of interest. Panel B considers the country-sectors with at least 20 firms with non missing average profit margin. All variables are averaged over the entire sample period (2006-2015). HHI Gross Sales and HHI Net Sales have been computed after trimming the sample at 1% at country-sector level. Net or gross sales present many missing values, we predict non-negative missing values using total assets, sector fixed effect, and the interaction term between sector and total assets, looking separately at each country.

## D. Online Appendix – Additional Results and Robustness

TABLE D.1—ENTRY AND EXIT

	(1)	(2)
	Pct new firms (std)	Pct closed firms (std)
Non-tradable sector x	0.0678	-0.00196
Antitrust Index - $\beta_1$	(0.0305)	(0.0224)
Observations	1,367	1,351
R-squared	0.850	0.888
N firms	54,993,643	48,119,148
N firms non-tradable	47,385,227	41,461,838
N countries	100	99
N sectors	20	20
Mean dependent variable	0.09	0.04
St. Dev. dependent variable	0.03	0.04
Country FE	YES	YES
Sector FE	YES	YES

*Note:* This table presents OLS estimates using the specification in equation 1, where the unit of observation is a country-sector cell, and the country-sectors contain at least 20 firms with non-missing financial statements data. Standard errors are clustered at country level and reported in parentheses. The Antitrust Index is from Hylton and Deng (2007). The variable non-tradable is a dummy variable taking the value one for all sectors other than Agriculture, Manufacturing and Mining. All counms include both country and sector fixed effects.

TABLE D.2—ALTERNATIVE HHI INDEXES

	(1)	(2)
	HHI Gross Sales (std)	HHI Net Sales (std)
Non-tradable sector x	-0.099	
Antitrust Index - $\beta_1$	(0.0575)	(0.0554)
Observations	1,006	1,008
R-squared	0.366	0.367
N firms	11,136,415	11,236,380
N firms non-tradable	9,589,379	9,668,482
N countries	89	89
N sectors	20	20
Mean dependent variable	3.23	3.25
St. Dev. dependent variable	6.17	6.18
Country FE	YES	YES
Sector FE	YES	YES

*Note:* This table presents OLS estimates using the specification in equation 1. The sample is as defined in Table 1 Panel A, unless otherwise specified. Standard errors are clustered at country level and reported in parentheses. The Antitrust Index is from Hylton and Deng (2007). The variable non-tradable is a dummy variable taking the value one for all sectors other than Agriculture, Manufacturing and Mining. The variable Herfindahl - Hirschman Index (HHI) is an index measuring the concentration of an industry based on firm net sales (Column 1) or gross sales (Column 2), it ranges between 0 (perfect competition) and 100 (monopoly). All columns include both country and sector fixed effects.

TABLE D.3—ALTERNATIVE CUTOFFS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Average Profit Margin (std)				
Non-tradable sector x	-0.123	-0.101	-0.115	-0.132	-0.12	-0.0857	-0.0614
Antitrust Index - $\beta_1$	(0.0380)	(0.0443)	(0.0423)	(0.0408)	(0.0367)	(0.0482)	(0.0545)
Cutoff	0	10	30	40	50	200	3000
Observations	1,389	1,193	1,041	994	955	769	394
R-squared	0.541	0.618	0.671	0.679	0.688	0.697	0.761
N firms	12,802,233	12,801,449	12,798,690	12,797,083	12,795,362	12,775,024	12,382,718
N firms non-tradable	10,516,750	10,516,129	10,513,853	10,512,348	10,510,797	10,494,919	10,168,878
N countries	109	104	88	83	80	63	40
N sectors	20	20	20	20	20	20	19
Mean dependent variable	7.49	7.05	6.70	6.50	6.24	5.83	5.78
St. Dev. dependent variable	9.71	8.78	8.27	8.23	8.09	7.64	7.82
Country FE	YES	YES	YES	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES	YES	YES	YES

*Note:* This table presents OLS estimates using the specification in equation 1. The sample is as defined in Table 1, Panel A unless otherwise specified. Standard errors are clustered at country level and reported in parentheses. The dependent variable, Profit Margin, is defined by Orbis as the profit or losses before tax and external items over operating revenue. The Antitrust Index is from Hylton and Deng (2007). The variable non-tradable is a dummy variable taking the value one for all sectors other than Agriculture, Manufacturing and Mining. We consider the country-sectors with at least 0, 10, 30, 40, 50, 200 or 3000 firms with non-missing data for the average profit margin in Columns 1 to 7. All columns include both country and sector fixed effects.

TABLE D.4—ALTERNATIVE SAMPLES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-tradable sector x	-0.153	-0.129	-0.0676	-0.14	-0.152	-0.0858	-0.188	-0.148
Antitrust Index - $\beta_1$	(0.0397)	(0.0356)	(0.0398)	(0.0596)	(0.0632)	(0.0449)	(0.0423)	(0.0560)
Sample	Mean 2006-2010	Average 2006-2015	2006	2007	2008	2009	2010	2011
Observations	1,000	954	845	877	904	923	952	970
R-squared	0.655	0.655	0.682	0.692	0.627	0.647	0.656	0.582
N firms	8,998,328	5,343,366	5,104,345	5,530,434	5,690,555	5,723,592	5,634,093	5,990,410
N firms non-tradable	7,216,377	4,347,578	4,016,206	4,355,641	4,434,258	4,549,090	4,728,485	4,907,369
N countries	89	83	81	83	84	85	86	88
N sectors	20	20	20	20	20	20	20	20
Mean dependent variable	6.62	6.73	7.47	8.13	6.24	5.53	6.65	6.30
St. Dev. dependent variable	8.34	7.35	8.28	8.63	7.78	8.22	8.11	7.79
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES	YES	YES	YES	YES

*Note:* This table presents OLS estimates using the specification in equation 1. The sample is as defined in Table 1 Panel A, unless otherwise specified. Standard errors are clustered at country level and reported in parentheses. The dependent variable, Profit Margin, is defined by Orbis as the profit or losses before tax and external items over operating revenue. The Antitrust Index is from Hylton and Deng (2007). The variable non-tradable is a dummy variable taking the value one for all sectors other than Agriculture, Manufacturing and Mining. In Column 1 we consider average profit margin over 2006-2010 period. In Column 2 we first take the average by year and then average by country-sector. Columns 3-8 report the results year by year for 2006-2011. In Columns 2-8 average profit margin has been computed after trimming the top/bottom 1% of firms within each country-sector-year. All columns include both country and sector fixed effects.

TABLE D.5—ALTERNATIVE SAMPLES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-tradable sector x	-0.135	-0.118	-0.149	Average Profit Margin (std)		-0.0464	-0.0936	HHI assets (std)
Antitrust Index - $\beta_1$	(0.0478)	(0.0437)	(0.0355)	-0.185	-0.103	(0.0489)	(0.0238)	-0.15
Sample	2012	2013	2014	2015	Mean 2006-2014	EU unique	EU unique	EU unique
Antitrust Index	Scope Index	Scope Index	Scope Index	Scope Index	Scope Index	Scope Index	Budget (USD)	Scope Index
Observations	996	995	904	168	1,110	696	551	704
R-squared	0.632	0.638	0.633	0.682	0.629	0.638	0.669	0.448
N firms	6,631,818	6,923,192	6,118,058	90,270	12,793,410	12,800,468	9,305,869	20,018,149
N firms non-tradable	5,478,139	5,743,993	5,185,113	80,217	10,508,781	10,515,350	7,516,707	17,105,174
N countries	88	88	84	25	94	71	55	74
N sectors	20	20	20	19	20	20	20	20
Mean dependent variable	6.52	7.03	7.50	10.20	6.80	7.89	7.40	5.66
St. Dev. dependent variable	8.04	8.08	7.76	9.07	8.53	9.30	8.80	9.50
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES	YES	YES	YES	YES

*Note:* This table presents OLS estimates using the specification in equation 1. The sample is as defined in Table 1 Panel A, unless otherwise specified. Standard errors are clustered at country level and reported in parentheses. The dependent variable, Profit Margin, is defined by Orbis as the profit or losses before tax and external items over operating revenue. The Antitrust Index is from Hylton and Deng (2007). Both of these variables are standardized and averaged between 2006 and 2015. The variable non-tradable is a dummy variable taking the value one for all sectors other than Agriculture, Manufacturing and Mining. Columns 1-4 report the results year by year for the period 2012-2015, where the average profit margin has been calculated after trimming the top/bottom 1% of firms within each country-sector-year. In Column 5, we the average profit margin is for the period 2006-2014. In Columns 6-8, all the countries member of European Union in 2006 are treated as a single country. In Column 7, antitrust index is Budget in USD as defined in Bradford et al. (2019) (see Section 4 for details) and covers the period 2006-2010. In Column 8, the dependent variable is the Herfindahl - Hirschman Index (HHI) measuring the concentration of an industry based on firm assets, ranging from 0 (perfect competition) to 100 (monopoly). All columns include both country and sector fixed effects.

TABLE D.6—WEIGHTING PROFIT MARGIN BY OPERATING REVENUES

	(1)	(2)	(3)	(4)	(5)
			Average Profit Margin (std)		
Non-tradable sector x	-0.219	-0.0768	-0.151	-0.157	-0.0290
Antitrust Index - $\beta_1$	(0.0676)	(0.0640)	(0.0593)	(0.0511)	(0.0447)
Non-tradable sector - $\beta_2$	0.0814				
	(0.0730)				
Antitrust Index - $\beta_3$		-0.169			
		(0.0635)			
Antitrust Index	Scope Index	Scope Index	Scope Index	Scope Index	Budget (USD)
Tradable definition	Baseline	Baseline	Baseline	Mian and Sufi	Baseline
Sample	2006-2015	2006-2015	2006-2015	2006-2015	2006-2010
Observations	1,066	1,066	1,066	1,066	889
R-squared	0.314	0.376	0.540	0.541	0.547
N firms	12,330,345	12,330,345	12,330,345	12,330,345	8,892,370
N firms non-tradable	10,115,761	10,115,761	10,115,761	9,622,786	7,169,720
N countries	93	93	93	93	75
N sectors	20	20	20	20	20
Mean dependent variable	6.01	6.01	6.01	6.01	6.33
St. Dev. dependent variable	7.26	7.26	7.26	7.26	7.18
Country FE	YES	NO	YES	YES	YES
Sector FE	NO	YES	YES	YES	YES

*Note:* This table presents OLS estimates using the specification in equation 1. The sample is as defined in Table 1 Panel A, unless otherwise specified. Standard errors are clustered at country level and reported in parentheses. The dependent variable, Profit Margin, is defined by Orbis as the profit or losses before tax and external items over operating revenue. When aggregating at country-sector we weight firms' profit margin by operating revenues. The Antitrust Index is from Hylton and Deng (2007). Both of these variables are standardized and averaged between 2006 and 2015. The variable non-tradable is a dummy variable taking the value one for all sectors other than Agriculture, Manufacturing and Mining. All columns include both country and sector fixed effects.

TABLE D.7—RESTRICTING NUMBER OF SECTORS PER COUNTRY

	(1)	(2)	(3)	(4)
		Average Profit Margin (std)		
Non-tradable sector x	-0.103	-0.103	-0.105	-0.0800
Antitrust Index - $\beta_1$	(0.0458)	(0.0514)	(0.0597)	(0.0469)
Number of sectors per country	5	10	15	20
Observations	1,065	1,004	909	120
R-squared	0.616	0.624	0.626	0.779
N firms	12,797,276	12,791,836	12,772,003	5,200,463
N firms non-tradable	10,513,150	10,509,322	10,496,408	4,585,427
N countries	65	57	49	6
N sectors	20	20	20	20
Mean dependent variable	6.42	5.98	5.72	7.47
St. Dev. dependent variable	8.21	7.69	7.41	8.07
Country FE	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES

*Note:* This table presents OLS estimates using the specification in equation 1. The sample is as defined in Table 1 Panel A, unless otherwise specified. In Columns 1 to 4, we consider those countries with at least 5, 10, 15 or 20 sectors and with at least 20 firms with non-missing average profit margin data. Standard errors are clustered at country level and reported in parentheses. The dependent variable, Profit Margin, is defined by Orbis as the profit or losses before tax and external items over operating revenue. The Antitrust Index is from Hylton and Deng (2007). Both of these variables are standardized and averaged between 2006 and 2015. The variable non-tradable is a dummy variable taking the value one for all sectors other than Agriculture, Manufacturing and Mining. All columns include both country and sector fixed effects.

TABLE D.8— OTHER ROBUSTNESS

	(1)	(2)	(3)	(4)	(5)	(6)
			Average Profit Margin (std)			
Non-tradable sector $\alpha$	-0.105	-0.105	-0.122	-0.0956	-0.103	-0.103
Antitrust Index - $\beta_1$	(0.0528)	(0.0385)	(0.0408)	(0.0406)	(0.0466)	(0.0380)
Observations	1,110	1,123	1,087	1,089	1,110	1,110
R-squared	0.797	0.647	0.639	0.651	0.631	0.631
N firms	12,800,308	13,132,056	11,783,874	12,701,900	12,800,308	12,800,308
N firms non-tradable	10,515,246	10,793,295	9,683,463	10,420,144	10,515,246	10,515,246
N countries	94	96	91	94	94	94
N sectors	20	20	20	20	20	20
Mean dependent variable	6.80	7.09	6.74	6.78	6.80	6.80
St. Dev. dependent variable	8.53	8.92	8.32	7.79	8.53	8.53
Country FE	YES	YES	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES	YES	YES
Weighted	Yes	No	No	No	No	No
Trim at firm level	1%	No	5%	1%	1%	1%
Trim at concentration measure level	No	No	No	1%	No	No
Standard errors	Cluster Country	Cluster Country	Cluster Country	Cluster Country	OLS	Cluster Country-Sector

*Note:* This table presents OLS estimates from equation 1. The sample defined as in Table 1 Panel A, unless otherwise specified. Standard errors are clustered at country level and reported in parentheses. Column 1 reports the result from a weighted regression where the weights are the number of firms in each country-sector with not missing profit margin. In Column 2, we do not trim our data. In Column 3, we trim top/bottom 5% firms based on average profit margin distribution within each country-sector level. In Column 4, we trim top/bottom 1% country-sectors based on average profit margin. In Column 5, we do not adjust standard errors. In Column 6, we consider standard errors clustered at country-sector level (*i.e.* Robust standard errors). Unless otherwise specified, all columns report the same specification as in Column 3 of Table 2. All columns include both country and sector fixed effects.

#### E. Online Appendix – Additional References

- Bradford, Anu, Adam S. Chilton, Christopher Megaw, and Nathaniel Sokol.** 2019. “Competition Law Gone Global: Introducing the Comparative Competition Law and Enforcement Datasets.” *Journal of Empirical Legal Studies*, 16(2): 411–443.
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## F. Online Appendix – Data References

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