

# Economic Crises and Trade Policy Competition – Online supplemental materials

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## Supporting Information

Table 1: Summary Statistics of Intensity Analysis (Monthly) Data

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>N</b>
Tariff Rate	0.256	0.214	8904
Price Shock	3.544	2.23	6336
Price Shock Squared	17.511	14.112	6336
Effective Penetration of Sector	0.072	0.082	7428
Import Penetration of Sector	0.081	0.124	7428
Export Share in Sector	0.107	0.132	7452
Brazil's Exports of Sector	609636.9	669185.4	8737
Brazil's Total Exports	36400000	9892588	8737

Table 2: Summary Statistics of Duration Analysis Data

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>N</b>
Tariff Rate	9.289	15.925	1233109
Crisis Duration	1.373	2.549	1260795
Crisis Duration Squared	8.381	23.573	1260795
Log GDP	27.032	1.483	1170099
Log GDP Per Capita	9.084	1.178	1170099
Democracy	7.31	4.403	1260795
Imports	31.847	20.926	1170099
Exchange Rate	281.024	566.737	1260795
Unemployment	6.031	3.173	1112317
Interest Rate	10.546	9.579	1137871
IMF Bailout	0.12	0.325	912317

Table 3: Lobbying During Crises

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Crisis Start	-1,095,830*
	(283609.9)
Crisis Start X Intermediate Goods Ratio	1,145,110*
	(481750)
R-Squared	0.964
N	3836

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Notes: Estimates from OLS regression. The dependent variable is lobbying expenditures for an industry. The unit of observation is the industry year. Robust standard errors, clustered by industry, appear in parentheses. Data cover 2007-2010. Constant not shown. “\*” denotes  $p < 0.05$ .

Table 4: Controlling for Duration - Brazilian Case

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Price Shock	0.335*
	(0.132)
Price Shock Squared	-0.032*
	(0.013)
Crisis Duration	0.227*
	(0.112)
Effective Penetration of Sector	0.246
	(0.812)
Import Penetration of Sector	-0.677
	(0.587)
Export Share in Sector	0.021
	(0.177)
Brazil's Exports of Sector	-0.011
	(0.032)
Brazil's Total Exports	-0.061*
	(0.021)
Month Fixed Effects	Yes
Year Fixed Effects	No
Industry Fixed Effects	Yes
R-Squared	0.618
N	2820

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Notes: Estimates from OLS regression. The dependent variable is the tariff rate for an industry. The unit of observation is the industry-month. Robust standard errors, clustered by industry, appear in parentheses. Constant not shown. Data cover 1986-1995. “\*” denotes  $p < 0.05$ .

Table 5: Controlling for Duration and Duration Squared - Brazilian Case

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Price Shock	0.335*
	(0.132)
Price Shock Squared	-0.032*
	(0.013)
Crisis Duration Squared	0.055*
	(0.015)
Effective Penetration of Sector	0.246
	(0.812)
Import Penetration of Sector	-0.677
	(0.587)
Export Share in Sector	0.021
	(0.177)
Brazil's Exports of Sector	-0.011
	(0.032)
Brazil's Total Exports	-0.048*
	(0.013)
Month Fixed Effects	Yes
Year Fixed Effects	No
R-Squared	0.618
N	2820

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Notes: Estimates from OLS regression. The dependent variable is the tariff rate for an industry. The unit of observation is the industry-month. Robust standard errors, clustered by industry, appear in parentheses. Constant not shown. Data cover 1986-1995. “\*” denotes  $p < 0.05$ .

Table 6: Effect of Price Shock Duration - Brazilian Case

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Crisis Duration	0.119*
	(0.012)
Crisis Duration Squared	-0.025*
	(0.004)
Effective Penetration of Sector	-2.489
	(1.478)
Import Penetration of Sector	1.718
	(1.178)
Export Share in Sector	-0.048
	(0.301)
Brazil's Exports of Sector	0.034
	(0.039)
Brazil's Total Exports	-0.025*
	(0.002)
Month Fixed Effects	Yes
Year Fixed Effects	No
Industry Fixed Effects	Yes
R-Squared	0.783
N	5641

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Notes: Estimates from OLS regression. The dependent variable is the tariff rate for an industry. The unit of observation is the industry-month. Robust standard errors, clustered by industry, appear in parentheses. Constant not shown. Data cover 1986-1995. “\*” denotes  $p < 0.05$ .

Table 7: Effect of Price Shock Intensity Using Alternate Shock Lags

	1	2	3	4	5
Price Shock	0.372*	0.373*	0.370*	0.299*	0.286*
	(0.173)	(0.155)	(0.141)	(0.131)	(0.130)
Price Shock Squared	-0.033*	-0.034*	-0.034*	-0.028*	-0.026*
	(0.016)	(0.015)	(0.013)	(0.013)	(0.013)
Effective Penetration of Sector	0.202	0.216	0.204	0.360	0.435
	(1.045)	(0.958)	(0.881)	(0.750)	(0.714)
Import Penetration of Sector	-0.595	-0.612	-0.618	-0.763	-0.821
	(0.789)	(0.717)	(0.644)	(0.552)	(0.533)
Export Share in Sector	-0.070	-0.038	-0.004	0.016	0.010
	(0.191)	(0.187)	(0.182)	(0.169)	(0.161)
Brazil's Exports of Sector	-0.001	-0.005	-0.009	-0.009	-0.009
	(0.035)	(0.034)	(0.033)	(0.032)	(0.031)
Brazil's Total Exports	-0.042*	-0.040*	-0.038*	-0.026*	-0.024*
	(0.013)	(0.011)	(0.010)	(0.008)	(0.008)
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
R-Squared	0.668	0.659	0.644	0.597	0.591
N	3102	3008	2914	2726	2632

Notes: Estimates from OLS regression. The dependent variable is the tariff rate for an industry. The unit of observation is the industry-month. Robust standard errors, clustered by industry, appear in parentheses. Data covers 1986-1995. Column 1 lags the price shock by 30 months, 2 by 32 months, 3 by 34 months, 4 by 38 months, and 5 by 40 months. Constant not shown. “\*” denotes  $p < 0.05$ .



Table 8: Removing Outliers

Crisis Duration	0.394*	0.202*
	(0.005)	(0.004)
Crisis Duration Squared	-0.038*	-0.022*
	(0.000)	(0.000)
Log GDP	-22.070*	-16.815*
	(0.188)	(0.148)
Log GDP per Capita	7.294*	5.411*
	(0.059)	(0.048)
Democracy	0.214*	0.072*
	(0.003)	(0.003)
Year Fixed Effects	Yes	Yes
Country-Industry Fixed Effects	Yes	Yes
R-Squared	0.955	0.967
N	1138016	1122350

Notes: Estimates from OLS regression. Column 1 removes outliers greater than five times the standard deviation, and Column 2 removes outliers greater than 3 times the standard deviation. The unit of observation is the country-industry year and the dependent variable is the tariff rate. In column 2, the dependent variable is the logged tariff rate. The data cover 1996-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country-industry fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 9: Conditioning on Initial Tariff Levels

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Crisis Duration	0.287*
	(0.024)
Crisis Duration Squared	-0.030*
	(0.002)
Initial Tariff X Crisis Duration	0.044*
	(0.005)
Initial Tariff X Crisis Duration Squared	-0.005*
	(0.001)
Log GDP	-19.546*
	(0.333)
Log GDP per Capita	7.912*
	(0.084)
Democracy	0.337*
	(0.005)
Year Fixed Effects	Yes
Country-Industry Fixed Effects	Yes
R-Squared	0.946
N	1091698

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Notes: Estimates from OLS regression. Results conditional on the initial tariff level in 1996. The unit of observation is the country-industry year and the dependent variable is the tariff rate. The data cover 1997-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country-industry fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 10: Controlling for Crisis Intensity

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Crisis Duration	0.670*
	(0.008)
Crisis Duration Squared	-0.060*
	(0.001)
Log GDP	-23.415*
	(0.217)
Log GDP per Capita	8.162*
	(0.070)
Democracy	0.350*
	(0.005)
Intensity	-0.332*
	(0.009)
Year Fixed Effects	Yes
Country-Industry Fixed Effects	Yes
R-Squared	0.938
N	1143070

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Notes: Estimates from OLS regression. The unit of observation is the country-industry year and the dependent variable is the tariff rate. The data cover 1997-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country-industry fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 11: Controlling for Crisis Intensity and Crisis Intensity Squared

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Crisis Duration	0.663*
	(0.010)
Crisis Duration Squared	-0.059*
	(0.001)
Log GDP	-23.404*
	(0.216)
Log GDP per Capita	8.161*
	(0.070)
Democracy	0.350*
	(0.005)
Intensity	-0.292*
	(0.024)
Intensity Squared	-0.015
	(0.008)
Year Fixed Effects	Yes
Country-Industry Fixed Effects	Yes
R-Squared	0.938
N	1143070

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Notes: Estimates from OLS regression. The unit of observation is the country-industry year and the dependent variable is the tariff rate. The data cover 1997-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country-industry fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 12: Alternative Measure of Crises: Reinhart and Rogoff

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Crisis Duration	0.528*
	(0.008)
Crisis Duration Squared	-0.050*
	(0.001)
Log GDP	-23.599*
	(0.216)
Log GDP per Capita	8.206*
	(0.071)
Democracy	0.360*
	(0.005)
Year Fixed Effects	Yes
Country-Industry Fixed Effects	Yes
R-Squared	0.938
N	1143070

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Notes: Estimates from OLS regression. The unit of observation is the country-industry year and the dependent variable is the tariff rate. The data cover 1997-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country-industry fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 13: Alternative Measure of Crises: Price Shocks

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Crisis Duration	0.235*
	(0.120)
Crisis Duration Squared	-0.050
	(0.029)
Log GDP	-18.380*
	(4.993)
Log GDP per Capita	5.059*
	(1.402)
Democracy	-0.076
	(0.091)
Year Fixed Effects	Yes
Country-Industry Fixed Effects	Yes
R-Squared	0.933
N	2165

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Notes: Estimates from OLS regression. The unit of observation is the country-industry year and the dependent variable is the tariff rate. The data cover 1997-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country-industry fixed effects, which are not shown. “\*” denotes  $p < 0.05$ . Note that the quadratic term on crisis duration is statistically significant at the 10% level.

Table 14: Effect of Crises on Antidumping

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Crisis Duration (Initial Period)	0.204*
	(0.063)
Crisis Duration (Later Period)	-0.128*
	(0.025)
Log GDP	0.727*
	(0.351)
Log GDP per Capita	0.717*
	(0.219)
Democracy	-0.041
	(0.045)
Year Fixed Effects	Yes
Country-Industry Fixed Effects	Yes
Log likelihood	-6615.4848
Chi Squared	415.30
N	26809

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Notes: Estimates from logistic regression. The unit of observation is the country-industry year and the dependent variable is an indicator for whether an anti-dumping investigation was initiated. The data cover 1996-2010. Robust standard errors, clustered by country-industry, appear in parentheses. The model includes year and country-industry fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 14 demonstrates that our results are robust to alternative measures of protection. As discussed earlier, countries typically rely on raising tariffs when seeking to increase trade protection because, relative to implementing other forms of protection, the bureaucratic overhead is low. For this reason, we use a measure of *ad valorem* tariffs as our dependent variable in our prior specifications. However, alternative methods of protection exist in the form of non-tariff barriers. The most common of these are anti-dumping duties, which comprise 78% of all trade remedies, and are used in response to foreign imports that are deemed below “fair market value.” In practice, anti-dumping duties are often applied as the result

of interest group pressure and other political and economic factors.<sup>1</sup> The process of securing anti-dumping duties begins when a domestic producer files a petition with a particular bureaucracy. For example, in the United States, producers file petitions with the International Trade Administration in the Department of Commerce. This bureaucracy then accepts or rejects the petition, and upon acceptance, the claim is investigated. If the investigation finds evidence that goods are priced below fair market value, anti-dumping duties are applied. While these duties represent a form of protection, the anti-dumping literature stresses that the investigations themselves can depress trade regardless of whether duties are actually applied.<sup>2</sup> Additionally, the WTO counts new investigations, rather than the imposition of anti-dumping duties, as its baseline measure of trade protection.<sup>3</sup> We therefore specify the dependent variable as an indicator of whether an anti-dumping investigation was initiated in a given year, for a particular industry of a certain country.<sup>4</sup> The sample is restricted to those states that used an anti-dumping measure at least once in the sample.<sup>5</sup> Using this measure as our dependent variable, we run a logistic regression including fixed effects for year and country-industry. Because squared terms are difficult to interpret in logistic regressions, we use a spline which allows us to estimate a separate slope before and after the cut-point.<sup>6</sup> We find that, indeed, protection increases as the crisis persists up to the cut-point, after which it declines through the remainder of the crisis.<sup>7</sup>

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<sup>1</sup>See Knetter and Prusa 2003.

<sup>2</sup>Staiger and Wolak 1994.

<sup>3</sup>See, for example, WTO 2012.

<sup>4</sup>In particular, the variable takes a value of one if a country initiated an anti-dumping case for any product line within an industry (based on six-digit HS codes) in a given year.

<sup>5</sup>Anti-dumping data are from the Bown (2011) Temporary Trade Barriers Database.

<sup>6</sup>We determine the cut-point using non-linear least squares, as is standard. See Wand 2012.

<sup>7</sup>We find a cut-point which occurs earlier in the crisis than that of our tariff analysis. This makes sense since anti-dumping investigations are initiated quickly, while actual tariff changes take longer to observe.



Table 15: Bound Tariffs

Crisis Duration	0.554*	0.116*	2.818*
	(0.008)	(0.035)	(0.120)
Crisis Duration Squared	-0.054*	-0.019*	-0.319*
	(0.001)	(0.003)	(0.016)
Log GDP	-24.106*	-51.092*	-23.173*
	(0.208)	(0.874)	(0.211)
Log GDP per Capita	8.343*	12.630*	8.077*
	(0.071)	(0.287)	(0.071)
Democracy	0.354*	0.364*	0.341*
	(0.005)	(0.013)	(0.005)
Bound	2.542*		
	(0.179)		
Crisis Duration X Bound			-2.343*
			(0.121)
Crisis Duration Squared X Bound			0.272*
			(0.016)
Year Fixed Effects	Yes	Yes	Yes
Country-Industry Fixed Effects	No	Yes	Yes
Country Fixed Effects	Yes	No	No
R-Squared	0.130	0.884	0.938
N	1059728	145514	1059728

Notes: Estimates from OLS regression. Column 2 excludes observation in which the tariff rates were bound. The dependent variable is the tariff rate for an industry. The unit of observation is the industry-month. Robust standard errors, clustered by industry, appear in parentheses. Data cover 1986-1995. “\*” denotes  $p < 0.05$ .

Table 16: Alternative Measure of Crises: Country Level Analysis

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Crisis Duration	0.307*
	(0.141)
Crisis Duration Squared	-0.025*
	(0.012)
Log GDP	-12.170*
	(3.710)
Log GDP per Capita	2.521*
	(1.097)
Democracy	-0.069
	(0.117)
Year Fixed Effects	Yes
Country Fixed Effects	Yes
R-Squared	0.904
N	473

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Notes: Estimates from OLS regression. The unit of observation is the country year and the dependent variable is the tariff rate. The data cover 1997-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 17: Accounting for Splits in Tariff Lines

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Crisis Duration	0.528*
	(0.008)
Crisis Duration Squared	-0.050*
	(0.001)
Log GDP	-23.599*
	(0.216)
Log GDP per Capita	8.206*
	(0.071)
Democracy	0.360*
	(0.005)
Year and Country-Industry Effects	Yes
R-Squared	0.938
N	1143070

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Notes: Estimates from OLS regression. The unit of observation is the country-industry year and the dependent variable is the tariff rate. The data cover 1997-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 18: Accounting for Veto Players

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Veto Players	-0.486*
	(0.005)
Crisis Duration	0.512*
	(0.007)
Crisis Duration Sq	-0.048*
	(0.001)
Log GDP	-21.799*
	(0.204)
Log GDP Per Capita	7.546*
	(0.071)
Democracy	0.610*
	(0.006)
Year Fixed Effects	Yes
Country Fixed Effects	Yes
R-Squared	0.941
N	1129946

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Notes: Estimates from OLS regression. The unit of observation is at the country-industry-year and the dependent variable is the tariff rate. The data cover 1997-2010. Robust standard errors, clustered by country-industry, appear in parentheses. All models include year and country fixed effects, which are not shown. “\*” denotes  $p < 0.05$ .

Table 19: Weight Each Country Contributes to Estimate

Country	Weight
Australia	0.025
Brazil	0.000
Canada	0.069
Chile	0.056
China	0.032
Colombia	0.022
Hungary	0.041
India	0.162
Japan	0.235
South Korea	0.071
Malaysia	0.048
Mexico	0.075
Thailand	0.065
Turkey	0.001
United States	0.197
Venezuela	0.047

Notes: Weights generated as the sum of the weights per country divided by the total amount of weights in the sample.

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