The Balance of Concessions in Trade Agreements
Online Appendix*

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1 Trade Remedies and WTO Tariff Concessions

In this section, we document the data compilation underlying our analysis of the relationship between tariff concessions and trade remedies (or alternatively, trade disputes), and present the full set of empirical results, including those reported in the main paper.

As discussed in the main paper, while the GATT/WTO's provisions for trade remedies may not be designed to restore reciprocity, they could in practice be used to offset tariff concessions. Having documented a substantial and widening deviation from reciprocity in bilateral concessions, it is natural to ask whether members have used trade remedies to restore the balance of concessions over time. If trade remedies serve as a safety valve through which countries claw back concessions that have become unbalanced, then the imbalances we measure would overstate the reciprocity gap that members actually sustain. We assess this possibility in this appendix.

Specifically, we examine whether the bilateral net concession measure developed in the paper is systematically related to the use of temporary trade barriers (TTBs) and, more broadly, other trade interventions reflected in WTO disputes. While TTBs are not legally intended to restore reciprocity in tariff concessions, they can in practice serve as mechanisms through which WTO members respond to perceived imbalances in tariff concessions. If the net concession measure captures economically meaningful asymmetries in negotiated market access, countries that have granted relatively larger net concessions to particular trading partners may be more likely to initiate TTBs or other trade interventions against those partners.[1]

We find empirical support for this tendency: larger bilateral net concessions are associated with greater use of TTB measures (and trade intervention measures in general that are challenged through the WTO dispute settlement procedure). At the same time, the associated increase in the value of trade affected by these measures is, on average, more than two orders of magnitude smaller than the corresponding increase

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[1] A body of empirical work suggests that countries have used TTB measures to offset their WTO tariff commitments. Bown and Tovar (2011) document this pattern for India, showing that antidumping duties were used to restore protection in sectors where tariff bindings constrained applied rates. Ketterer (2016) finds that larger Uruguay Round tariff cuts are associated with a higher probability of subsequent EU antidumping investigations. Kuenzel (2020) provides evidence of an inverse relationship between tariff overhangs and TTBs across 30 WTO members. Bown and Crowley (2013) document that TTBs respond to terms-of-trade shocks.

in net concessions, implying that existing trade remedies offset only a negligible fraction of the imbalance captured by our net concession measure.

1.1 Data and Measurement

Temporary Trade Barriers

We document how we measure the trade flows affected by temporary trade barriers (TTB) at the directed country-pair-year level, with respect to each of the three instruments—antidumping (AD), countervailing duty (CVD), and safeguard (SG)—or their union (ALL). The data on the use of TTB for the study period 1995–2018 are sourced from the World Bank.[2] We compile the list of products that are named in TTB cases initiated in each year, by the initiating country and the investigated country. The listed HS product codes in the TTB database vary in their digits and their vintages (HS92, HS96, ..., to HS2017). We harmonize the product list to HS92 nomenclature at 6 digits, and obtain the implied trade value using the BACI product-level trade flow database (available at the HS 6-digit level).[3] In particular, for each TTB measure initiated by importer j against exporter i in year t, the targeted HS 6-digit products are matched to year $t-1$ bilateral trade flows of these products in the BACI database, to capture pre-investigation trade exposure at the ijt level (combined across targeted products). The set of countries is harmonized to match the current study's grouping for EU and the ROW. For safeguard measures, which are applied on a multilateral basis, each case is populated across all trading partners of the initiating country-year. Products targeted by more than one instrument are deduplicated when imputing the trade value affected by the union of TTB measures for each ijt observation. The latest release of CEPII BACI HS92 begins in 1995, one year short of what is needed for measures initiated in 1995; trade exposure for that first sample year is instead matched using 1994 data recovered from an earlier CEPII BACI HS92 vintage.[4] Directed country-pair-years with no filing of a given TTB type are assigned an affected trade value of zero, yielding a balanced panel of $N = 33{,}744$ observations (38×37 directed country pairs $\times$ 24 years, 1995–2018).[5]

WTO Disputes

The compilation of trade flows affected by WTO disputes combines two sources depending on the period. For 1995–2011, it is taken directly from the Trade Flows and Trade Disputes (TFTD) database of Bown and Reynolds (2014), which reports product-specific pre-dispute bilateral trade values for import-restriction disputes. For 2012–2018, we compiled the data by scraping WTO dispute case pages (DS428 onward) and identifying the affected HS 6-digit products from consultation requests, WTO notifications, the product-level TTB database constructed above (for disputes that concern TTB measures), and by tokenizing/matching of case documents against BACI HS 6-digit product descriptions.[6] The identified list of product codes is

[2] https://www.worldbank.org/en/data/interactive/2021/03/02/temporary-trade-barriers-database. See Bown et al. (2020).

[3] https://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=37. The release on January 30, 2026 for HS92 covers the period 1995–2024.

[4] https://www.cepii.fr/DATA_DOWNLOAD/baci/legacy/202102/BACI_HS92_V202102.zip.

[5] Recall that KAZ and ROW are dropped from the study of bilateral net concessions.

[6] Precise HS 6-digit product codes for the 2012–2018 WTO disputes are identified using a sequential priority cascade of sources. First, for the nine U.S. Section 232 steel and aluminum tariff disputes, we use the complete HTS code annexes contained in the underlying presidential proclamations. Second, we extract HS 6-digit codes explicitly reported in the consultation requests and supplement them with any HS 6-digit codes reported in referenced WTO notifications (safeguards, antidumping, subsidies, TBT, or SPS) (4 disputes). Third, where only HS 4-digit headings are available from these documents, we validate them against the stated products and expand them to the corresponding HS 6-digit codes (7 disputes). Fourth, for disputes citing the Antidumping, Countervailing, or Safeguards Agreements, we use product codes from the corresponding cases in the

then harmonized to HS92 nomenclature and matched to BACI bilateral trade flows pre-dispute to measure the scope of disputed trade value at the directed country-pair-year level. The sample is similarly a balanced panel of $N = 33{,}744$ observations (38×37 directed country pairs $\times$ 24 years, 1995–2018).

Table 1 reports summary statistics for the trade values affected by TTB measures and WTO disputes in the estimation sample.

1.2 Estimation Results

Temporary Trade Barriers

In the first set of analyses, we examine whether increased concession imbalance is associated with increased use of TTB measures. In particular, the scope of TTB-affected trade (TTB_{ijt}) is measured by the pre-initiation trade value (in year $t-1$) of all HS 6-digit products targeted by the respective temporary trade barrier (antidumping, countervailing duty, safeguard, or their union) initiated by importing country j against exporting country i in year t. We regress this measure on the bilateral net concession (NC) of country j to country i in year t using the PPML estimator, with standard errors clustered at the directed country-pair level. Table 2 reports the estimation results for each TTB measure and their union, with respect to the net concession measures derived from each of the three quantitative trade models (as characterized in the main paper). Specifications I-III include increasingly more fixed-effect (FE) controls. The bivariate and year-FE specifications (I and II) show a uniformly positive association between the TTB-targeted trade value and the net concession. This pattern holds across all TTB measures and the model variants that generated the net concession measures. The association tends to be stronger for antidumping (AD) and countervailing duty (CVD) measures, and weaker for safeguards (SG). Adding further directed country-pair FE in Specification III substantially attenuates the positive association, and renders the coefficients insignificant in the case of SG. Overall, we observe a positive tendency for a country to resort to TTB measures against trading partners to whom it has granted more net concessions, with cross-sectional variations playing a more significant role than within-pair variations over time.

Using the specification for the union of TTB instruments with year FEs in Table 2 as examples, a US$1 million increase in bilateral net concessions is associated with increases in expected TTB-affected trade by 0.03912%, 0.05402%, and 0.05526% under the three model variants, respectively. Evaluated at the sample mean of TTB-affected trade value of US$12.57 million reported in Table 1, these estimates imply increases in TTB-affected trade of US$0.00492 million, US$0.00679 million, and US$0.00695 million, respectively—more than two orders of magnitude smaller than the increase in net concessions. Thus, although greater concession imbalances are systematically associated with greater use of TTB measures, the implied quantitative offset is limited.[7] The estimation results for the individual instruments in Table 2 imply very similar patterns qualitatively and quantitatively.

TTB database (17 disputes). Finally, for the remaining disputes, we tokenize the WTO product-description metadata or, if unavailable, the consultation-request text, and match these against the 5,020 HS 6-digit product descriptions in BACI (51 disputes). The remaining 26 disputes cannot be assigned reliable HS 6-digit codes and are therefore assigned a disputed trade value of zero.

[7] Under the PPML specification, the expected TTB-affected trade value following a change in net concessions ΔNC is calculated as $Y'/Y = \exp(\hat{\beta}\Delta NC)$, where Y is the initial TTB-affected trade value. The associated change is $\Delta Y = Y' - Y = Y[\exp(\hat{\beta}\Delta NC) - 1]$.

WTO Disputes

The tendency to use TTB measures to offset imbalances in bilateral tariff concessions may also be reflected in WTO disputes, in which the country initiating the TTB measure subsequently becomes the respondent (RES) to a complaint filed by the affected exporting country, the complainant (COM). We therefore conduct a parallel analysis using trade values subject to WTO disputes. These overlap with TTB-affected trade values when exporting countries challenge TTB measures imposed by importing countries, although not all TTB measures are challenged through the WTO dispute settlement mechanism. At the same time, WTO disputes are not limited to TTB measures, but also cover other trade policies. Examining WTO disputes therefore provides a complementary test of whether WTO members use trade interventions to offset imbalances in bilateral tariff concessions.

Unlike the TTB measures, which are invariably imposed by the importing country, the respondent (RES) of a WTO dispute may be an importer (if the disputed measures are import restriction measures) or an exporter (if the disputed measures are export measures). We thus approach the analysis from two potential perspectives. First, in the importer-exporter perspective, we examine how the pre-dispute trade value of all HS 6-digit products named in WTO disputes initiated by complainant country COM against respondent country RES in year t is correlated with the net concession (NC) of importing country IM to exporting country EX in year t. Second, in the respondent-complainant perspective, the net concession of respondent country RES to complainant country COM in year t is used instead. The two perspectives coincide for pairs where the importer (exporter) is the respondent (complainant), as is the case for disputes involving import restrictions. They are the opposite for pairs where the importer (exporter) is the complainant (respondent). We will see that the results are very similar across these two perspectives, as the WTO disputes consisted predominantly of cases involving import measures (449/488, or 92.0%) during the study period.

Table 3 reports the results for both perspectives and across the three trade model variants used to generate the bilateral net concession measures. We begin with the importer-exporter perspective. The bivariate and year-FE specifications (I and II) indicate a positive and significant association between WTO-dispute-affected trade value and the bilateral net concession. This pattern holds across all three trade model variants, echoing that observed for TTB measures in Table 2. However, the association disappears once country-pair fixed effects are added in Specification III. The estimated coefficients shrink by roughly two orders of magnitude and become statistically insignificant across all three trade models. The results are very similar under the respondent-complainant perspective. When statistically significant, the estimated coefficients range from 0.00029 to 0.00039. They are smaller compared with the corresponding coefficient estimates for TTB, but are within the same order of magnitude.

To illustrate the magnitude of the estimates, consider the specifications with year FEs in Table 3. From the importer-exporter perspective, an additional US$1 million in bilateral net concessions corresponds to increases of 0.02952%, 0.03941%, and 0.03865% in expected WTO-dispute-affected trade value under the three model variants, respectively. Applying these estimates to the sample mean of trade affected by WTO disputes (US$9.61 million, as reported in Table 1) implies expected increases in WTO-dispute-affected trade of US$0.00284 million, US$0.00379 million, and US$0.00371 million, respectively—more than two orders of magnitude below the increase in net concessions. Estimates based on the respondent-complainant perspective are comparable in size, although the IO-model coefficient is statistically insignificant. The estimated association also becomes insignificant when country-pair FEs are included. Overall, even where the relationship is statistically significant, the amount of trade implicated in WTO disputes is on average only a minute fraction of the corresponding increase in the concession imbalance.

Taken together with the results in Table 2, the empirical analyses above suggest that countries tend to direct TTB measures (and, more broadly, other trade intervention measures reflected in WTO disputes) toward trading partners to whom they have granted relatively larger net tariff concessions. However, the associated increase in the magnitude of trade affected by these measures is, on average, more than two orders of magnitude smaller than the corresponding increase in net bilateral concessions. Thus, although trade remedies appear to be systematically associated with concession imbalances, they offset only a negligible fraction of those imbalances in quantitative terms, leaving the vast majority of bilateral imbalances in WTO tariff concessions unresolved.

1.3 Multilateral Net Concession

The bilateral analyses above examine whether a country directs more TTB measures or other trade interventions reflected in WTO disputes toward trading partners to whom it has granted larger net tariff concessions. We now ask whether a similar relationship holds at the multilateral level: do countries that grant larger net concessions to their trading partners as a whole also tend to make greater use of TTB measures or other trade interventions overall? For each country-year, we aggregate both the net concession measure and the corresponding affected trade value across all 37 trading partners (excluding KAZ and ROW), yielding a panel of 912 observations (38 countries $\times$ 24 years). We then re-estimate the same three specifications—without fixed effects, with year fixed effects, and with country and year fixed effects—using this multilateral panel, with standard errors clustered by country.

Table 5 reports the results for each TTB measure and their union. As in the bilateral analysis, Specifications I and II show a uniformly positive and significant association between multilateral TTB-affected trade and multilateral net concessions across all TTB measures and all three quantitative trade models. Once country fixed effects are added in Specification III, however, the association weakens substantially. This pattern echoes the bilateral results in Table 2, suggesting that the positive association is driven primarily by cross-country differences in multilateral net concessions, with substantially weaker evidence from within-country variation over time.

To illustrate the magnitude of the association, consider the year-FE specifications for the union of TTB instruments in Table 5. A US$1 million increase in a country's multilateral net concessions is associated with increases of 0.00618%, 0.00791%, and 0.01006% in expected multilateral TTB-affected trade under the three model variants, respectively. Evaluated at the sample mean of multilateral TTB-affected trade of US$464.95 million reported in Table 4, these estimates imply increases of US$0.02873 million, US$0.03678 million, and US$0.04678 million, respectively—roughly one-and-a-half orders of magnitude smaller than the corresponding increase in net concessions.

Table 6 reports the corresponding results for WTO disputes under both perspectives. As with the TTB measures, Specifications I and II show a positive and highly significant association between WTO-dispute-affected trade and multilateral net concessions across all three model variants and both perspectives. This association again disappears once country fixed effects are introduced in Specification III. This pattern closely mirrors the bilateral results in Table 3.

To gauge the magnitude of the association, consider the year-FE specifications in Table 6. From the importer-exporter perspective, an additional US$1 million in a country's multilateral net concessions is associated with increases of 0.00820%, 0.01030%, and 0.01292% in expected multilateral WTO-dispute-affected trade under the three model variants, respectively. Applying these estimates to the sample mean of multilateral WTO-dispute-affected trade value (US$355.58 million, as reported in Table 4) implies expected

increases of US$0.02916 million, US$0.03663 million, and US$0.04594 million, respectively—again roughly one-and-a-half orders of magnitude smaller than the corresponding increase in net concessions. Estimates based on the respondent-complainant perspective are very similar in magnitude.

Taken together, the multilateral analyses reinforce the bilateral findings above. Countries with larger multilateral net tariff concessions tend to make greater use of TTB measures and, more broadly, other trade interventions reflected in WTO disputes. As at the bilateral level, however, the associated increase in the magnitude of TTB-affected (or WTO-dispute-affected) trade is much smaller relative to the corresponding increase in multilateral net tariff concessions. Trade remedies therefore offset only a negligible fraction of imbalances in net tariff concessions.

Table 1: Summary Statistics of TTB- and WTO-Dispute-Affected Trade Value

	All pair-years				Obs with affected trade > 0		
Measure	N	Mean	SD	$N_{>0}$ (%)	Median	Mean	Max
Panel A: TTB-affected trade value (million USD), by instrument							
AD	33,744	9.60	240.07	1,905 (5.6)	15.63	170.01	26,601.76
CVD	33,744	4.44	197.04	250 (0.7)	54.20	598.78	20,337.26
SG	33,744	2.81	55.98	2,353 (7.0)	0.49	40.26	3,874.49
ALL	33,744	12.57	259.46	3,792 (11.2)	4.26	111.82	27,730.09
Panel B: WTO-dispute-affected trade value (million USD), by perspective							
Importer-Exporter	33,744	9.61	282.40	295 (0.9)	125.21	1,099.29	24,976.27
Respondent-Complainant	33,744	9.61	282.43	294 (0.9)	124.44	1,103.03	24,976.27

Notes: A balanced panel (1,406 directed country pairs × 24 years, 1995–2018) used in Tables 2–3. "All pair-years" summarizes the trade value over the full panel, including the pair-years with no filing/dispute (zero affected trade). $N_{>0}$ (%) gives the count and share of directed pair-years with strictly positive affected trade value. "Obs with affected trade > 0" summarizes the trade value conditional on observations with positive affected trade values. In Panel B, the sample statistics differ slightly between the two perspectives ($N_{>0} = 295$ vs. 294) because underlying disputes are mapped into directed country pairs differently under the (EX, IM) and (COM, RES) definitions and, when multiple disputes map to the same directed pair-year, are collapsed differently.

Table 2: Regression of Trade Value Affected by TTBs on Net Tariff Concessions

	Goods-Only Model		Model with Goods and Services		IO Model	
Specification	$\hat{\beta}$	SE	$\hat{\beta}$	SE	$\hat{\beta}$	SE
Antidumping (AD)						
I. No FE	0.0004099^{***}	(0.0000438)	0.0005714^{***}	(0.0000209)	0.0005811^{***}	(0.0000603)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
II. Year FE	0.0004285^{***}	(0.0000486)	0.0005787^{***}	(0.0000295)	0.0006071^{***}	(0.0000596)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
III. Pair+Year FE	0.0000708^{*}	(0.0000386)	0.0001021^{**}	(0.0000468)	0.0001114^{**}	(0.0000545)
N; clusters	8,424; 351		8,424; 351		8,424; 351	
Countervailing Duty (CVD)						
I. No FE	0.0004504^{***}	(0.0000472)	0.000639^{***}	(0.000025)	0.0006366^{***}	(0.0000665)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
II. Year FE	0.0004891^{***}	(0.0000474)	0.0006592^{***}	(0.0000361)	0.0006841^{***}	(0.0000548)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
III. Pair+Year FE	0.0001583^{**}	(0.0000746)	0.0002^{**}	(0.0000909)	0.0002442^{**}	(0.0001085)
N; clusters	1,968; 82		1,968; 82		1,968; 82	
Safeguards (SG)						
I. No FE	0.0003379^{***}	(0.0000333)	0.0004604^{***}	(0.0000299)	0.0004699^{***}	(0.0000476)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
II. Year FE	0.0002876^{***}	(0.0000375)	0.0004062^{***}	(0.0000327)	0.0003968^{***}	(0.0000552)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
III. Pair+Year FE	0.0000192	(0.0000512)	0.0000442	(0.0000701)	0.0000414	(0.0000783)
N; clusters	16,320; 680		16,320; 680		16,320; 680	
All Instruments (AD+CVD+SG)						
I. No FE	0.0003964^{***}	(0.0000423)	0.0005502^{***}	(0.0000197)	0.000561^{***}	(0.0000582)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
II. Year FE	0.0003911^{***}	(0.0000487)	0.0005401^{***}	(0.0000277)	0.0005524^{***}	(0.0000647)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
III. Pair+Year FE	0.0000657^{*}	(0.0000386)	0.0000963^{**}	(0.0000458)	0.0001036^{*}	(0.0000537)
N; clusters	17,016; 709		17,016; 709		17,016; 709	

Notes: The left-hand-side variable is the trade value (million USD, in year $t-1$) of HS 6-digit products targeted by the temporary trade barriers (antidumping, countervailing duty, safeguard, or their union) initiated by importer j against exporter i in year t. The right-hand-side variable is the net concession (NC, in million USD) of country j to country i in year t for the model variant indicated. PPML estimation, with standard errors clustered at the directed country-pair level. The numbers of observations differ across specifications, as observations with no within-FE-group variation are dropped by `ppmlhdfe`. Statistical significance is defined by the convention: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.10$.

Table 3: Regression of WTO Dispute Trade Value on Net Tariff Concessions

	Goods-Only Model		Model with Goods and Services		IO Model	
Specification	$\hat{\beta}$	SE	$\hat{\beta}$	SE	$\hat{\beta}$	SE
Importer-Exporter Perspective						
I. No FE	0.0002996^{***}	(0.0001111)	0.0003919^{**}	(0.0001772)	0.0003977^{*}	(0.0002109)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
II. Year FE	0.0002952^{**}	(0.0001332)	0.0003940^{*}	(0.0002026)	0.0003864^{*}	(0.0002293)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
III. Pair+Year FE	0.0000059	(0.0000648)	0.0000031	(0.0000882)	0.0000007	(0.0001041)
N; clusters	3,000; 125		3,000; 125		3,000; 125	
Respondent-Complainant Perspective						
I. No FE	0.0002955^{**}	(0.0001187)	0.0003852^{**}	(0.0001918)	0.0003899^{*}	(0.0002304)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
II. Year FE	0.0002903^{**}	(0.0001396)	0.0003865^{*}	(0.0002158)	0.0003780	(0.0002459)
N; clusters	33,744; 1,406		33,744; 1,406		33,744; 1,406	
III. Pair+Year FE	0.0000028	(0.0000647)	−0.0000009	(0.0000878)	−0.0000043	(0.0001036)
N; clusters	3,000; 125		3,000; 125		3,000; 125	

Notes: The left-hand-side variable is the trade value (million USD, in year $t-1$) of HS 6-digit products named in WTO disputes initiated by country COM against country RES in year t. The right-hand-side variable is the net concession (NC, in million USD) of country IM to country EX in year t (in the importer-exporter perspective), or of country RES to country COM in year t (in the respondent-complainant perspective), for the model variant indicated. PPML estimation, with standard errors clustered at the directed country-pair level. The numbers of observations differ across specifications, as observations with no within-FE-group variation are dropped by `ppmlhdfe`. Statistical significance is defined by the convention: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.10$.

Table 4: Summary Statistics of Multilateral TTB- and WTO-Dispute-Affected Trade Value

	All country-years				Obs with affected trade > 0		
Measure	N	Mean	SD	$N_{>0}$ (%)	Median	Mean	Max
Panel A: Multilateral TTB-affected trade value (million USD), by instrument							
AD	912	355.11	1,731.98	428 (46.9)	96.64	756.68	28,091.24
CVD	912	164.14	1,357.65	117 (12.8)	121.06	1,279.45	20,569.24
SG	912	103.87	824.39	134 (14.7)	114.15	706.91	15,171.64
ALL	912	464.95	2,124.90	465 (51.0)	113.84	911.90	29,301.49
Panel B: Multilateral WTO-dispute-affected trade value (million USD), by perspective							
Importer-Exporter	912	355.58	2,144.19	154 (16.9)	227.99	2,105.78	36,804.01
Respondent-Complainant	912	355.58	2,144.43	153 (16.8)	226.91	2,119.54	36,804.01

Notes: A country-year panel (38 countries × 24 years, 1995–2018) used in Tables 5–6, in which the affected trade value is summed across each country's 37 trading partners (excluding KAZ and ROW). "All country-years" summarizes the trade value over the full panel, including country-years with no affected trade. $N_{>0}$ (%) gives the count and share of country-years with strictly positive affected trade value. "Obs with affected trade > 0" summarizes the trade value conditional on observations with positive affected trade value. In Panel B, the sample statistics differ slightly between the two perspectives because underlying disputes are mapped into focal countries differently under the (EX, IM) and (COM, RES) definitions.

Table 5: Regression of Multilateral Trade Value Affected by TTBs on Multilateral Net Tariff Concessions

	Goods-Only Model		Model with Goods and Services		IO Model	
Specification	$\hat{\beta}$	SE	$\hat{\beta}$	SE	$\hat{\beta}$	SE
Antidumping (AD)						
I. No FE	0.0000663***	(0.00000523)	0.000086***	(0.00000703)	0.0001094***	(0.00000910)
N; clusters	912; 38		912; 38		912; 38	
II. Year FE	0.000066***	(0.00000573)	0.000084***	(0.00000774)	0.0001071***	(0.00000977)
N; clusters	912; 38		912; 38		912; 38	
III. Country+Year FE	0.00002*	(0.0000105)	0.0000212	(0.0000136)	0.0000321*	(0.0000184)
N; clusters	600; 25		600; 25		600; 25	
Countervailing Duty (CVD)						
I. No FE	0.0000805***	(0.00000734)	0.000105***	(0.00000986)	0.0001338***	(0.0000129)
N; clusters	912; 38		912; 38		912; 38	
II. Year FE	0.000084***	(0.0000113)	0.0001066***	(0.0000152)	0.0001359***	(0.0000191)
N; clusters	912; 38		912; 38		912; 38	
III. Country+Year FE	0.0000255**	(0.000011)	0.0000242*	(0.000014)	0.0000401**	(0.0000201)
N; clusters	360; 15		360; 15		360; 15	
Safeguards (SG)						
I. No FE	0.0000556***	(0.00000605)	0.0000717***	(0.00000800)	0.0000893***	(0.000011)
N; clusters	912; 38		912; 38		912; 38	
II. Year FE	0.0000489***	(0.00000608)	0.0000633***	(0.00000800)	0.0000799***	(0.0000113)
N; clusters	912; 38		912; 38		912; 38	
III. Country+Year FE	-0.0000000271	(0.00000912)	-0.00000268	(0.0000126)	-0.00000559	(0.0000175)
N; clusters	624; 26		624; 26		624; 26	
All Instruments (AD+CVD+SG)						
I. No FE	0.000064***	(0.00000530)	0.0000828***	(0.00000709)	0.000105***	(0.00000934)
N; clusters	912; 38		912; 38		912; 38	
II. Year FE	0.0000618***	(0.00000552)	0.0000791***	(0.00000739)	0.0001006***	(0.00000972)
N; clusters	912; 38		912; 38		912; 38	
III. Country+Year FE	0.0000131*	(0.00000787)	0.0000132	(0.0000104)	0.0000201	(0.0000143)
N; clusters	648; 27		648; 27		648; 27	

Notes: The left-hand-side variable is the multilateral trade value (million USD, in year $t-1$) of HS 6-digit products targeted by the temporary trade barriers (antidumping, countervailing duty, safeguard, or their union) initiated by country j against its 37 trading partners (excluding KAZ and ROW) in year t, summed across partners. The right-hand-side variable is the multilateral net concession (NC, in million USD) extended by country j to its trading partners in year t, summed across partners, for the indicated model variant. PPML estimation, with standard errors clustered by country. The numbers of observations differ across specifications, as observations with no within-FE-group variation are dropped by `ppmlhdfe`. Statistical significance is defined by the convention: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.10$.

Table 6: Regression of Multilateral WTO Dispute Trade Value on Multilateral Net Tariff Concessions

	Goods-Only Model		Model with Goods and Services		IO Model	
Specification	$\hat{\beta}$	SE	$\hat{\beta}$	SE	$\hat{\beta}$	SE
Importer-Exporter Perspective						
I. No FE	0.0000641^{***}	(0.00000605)	0.0000828^{***}	(0.00000803)	0.0001051^{***}	(0.0000101)
N; clusters	912; 38		912; 38		912; 38	
II. Year FE	0.000082^{***}	(0.0000153)	0.000103^{***}	(0.0000212)	0.0001292^{***}	(0.0000243)
N; clusters	912; 38		912; 38		912; 38	
III. Country+Year FE	0.0000216	(0.0000198)	0.000019	(0.0000269)	0.0000281	(0.0000339)
N; clusters	528; 22		528; 22		528; 22	
Respondent-Complainant Perspective						
I. No FE	0.000064^{***}	(0.00000606)	0.0000826^{***}	(0.00000805)	0.000105^{***}	(0.0000101)
N; clusters	912; 38		912; 38		912; 38	
II. Year FE	0.0000817^{***}	(0.0000155)	0.0001026^{***}	(0.0000215)	0.0001288^{***}	(0.0000246)
N; clusters	912; 38		912; 38		912; 38	
III. Country+Year FE	0.0000212	(0.0000205)	0.0000185	(0.0000275)	0.0000278	(0.0000347)
N; clusters	528; 22		528; 22		528; 22	

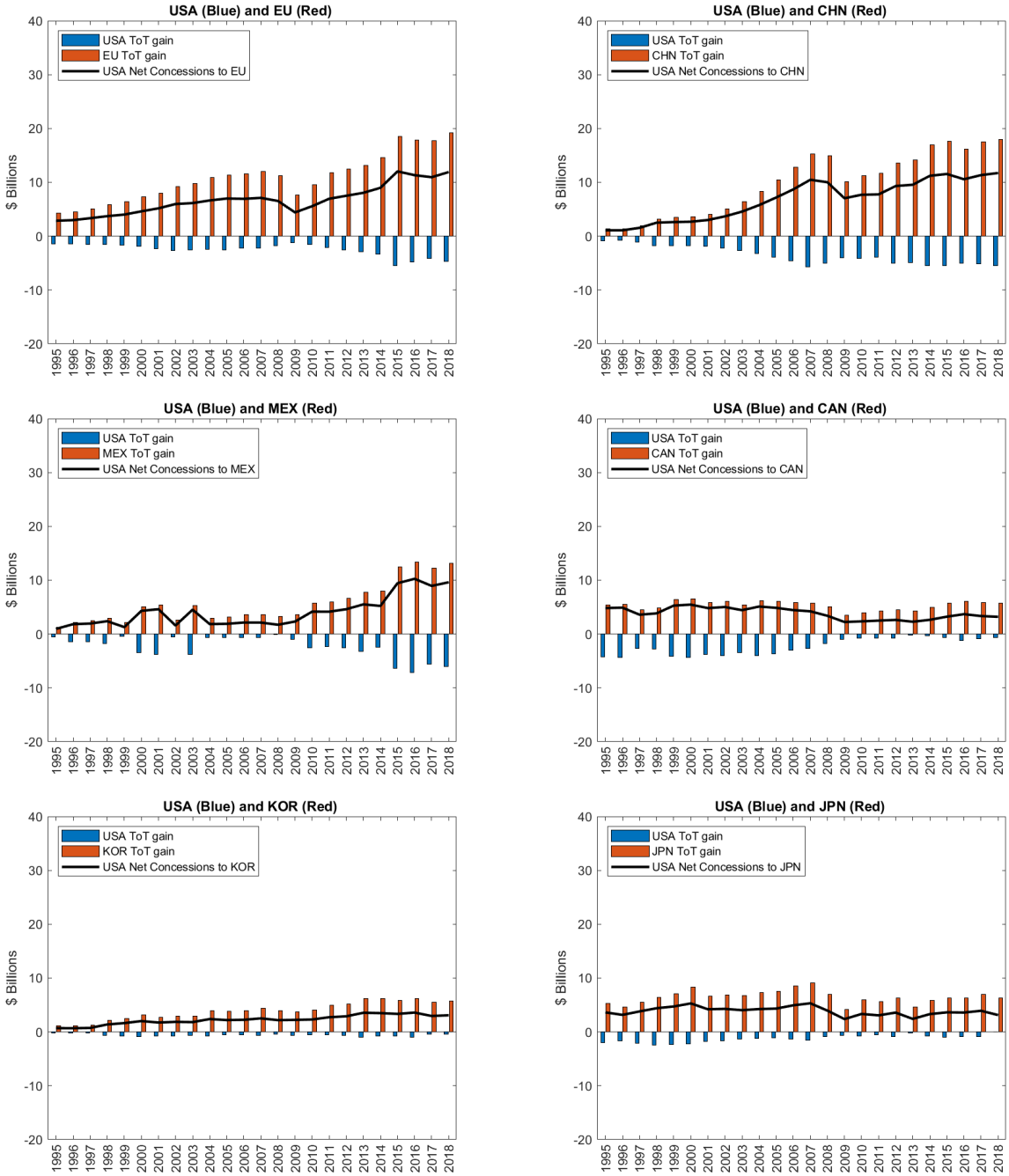
Notes: The left-hand-side variable is the multilateral trade value (million USD, in year $t-1$) of HS 6-digit products named in WTO disputes, summed across the focal country's 37 trading partners (excluding KAZ and ROW): export partners under the importer-exporter perspective, and complainant partners under the respondent-complainant perspective. The right-hand-side variable is the multilateral net concession (NC, in million USD) of country IM to its export partners (importer-exporter perspective), or of country RES to its complainant partners (respondent-complainant perspective), in year t, summed across partners, for the indicated model variant. PPML estimation, with standard errors clustered by the focal country. The numbers of observations differ across specifications, as observations with no within-FE-group variation are dropped by `ppmlhdfe`. Statistical significance is defined by the convention: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.10$.

2 Alternative Noncooperative Benchmarks: Uniform 25% and 75% Tariffs

The main paper's baseline results use the bilateral Nash tariffs as the noncooperative disagreement benchmark, and Appendix D of the main paper reports a robustness check in which the disagreement benchmark is instead a uniform 50% tariff applied by each country pair against one another. To help readers gauge the sensitivity of our results to the level of the disagreement tariff, this appendix reports the same set of figures under two additional uniform-tariff benchmarks: a 25% uniform tariff and a 75% uniform tariff. As in the main paper, the noncooperative tariff is set equal to the applied tariff in the oil sector and in sectors where the applied tariff exceeds the disagreement benchmark. All figures below are based on the goods-only model.

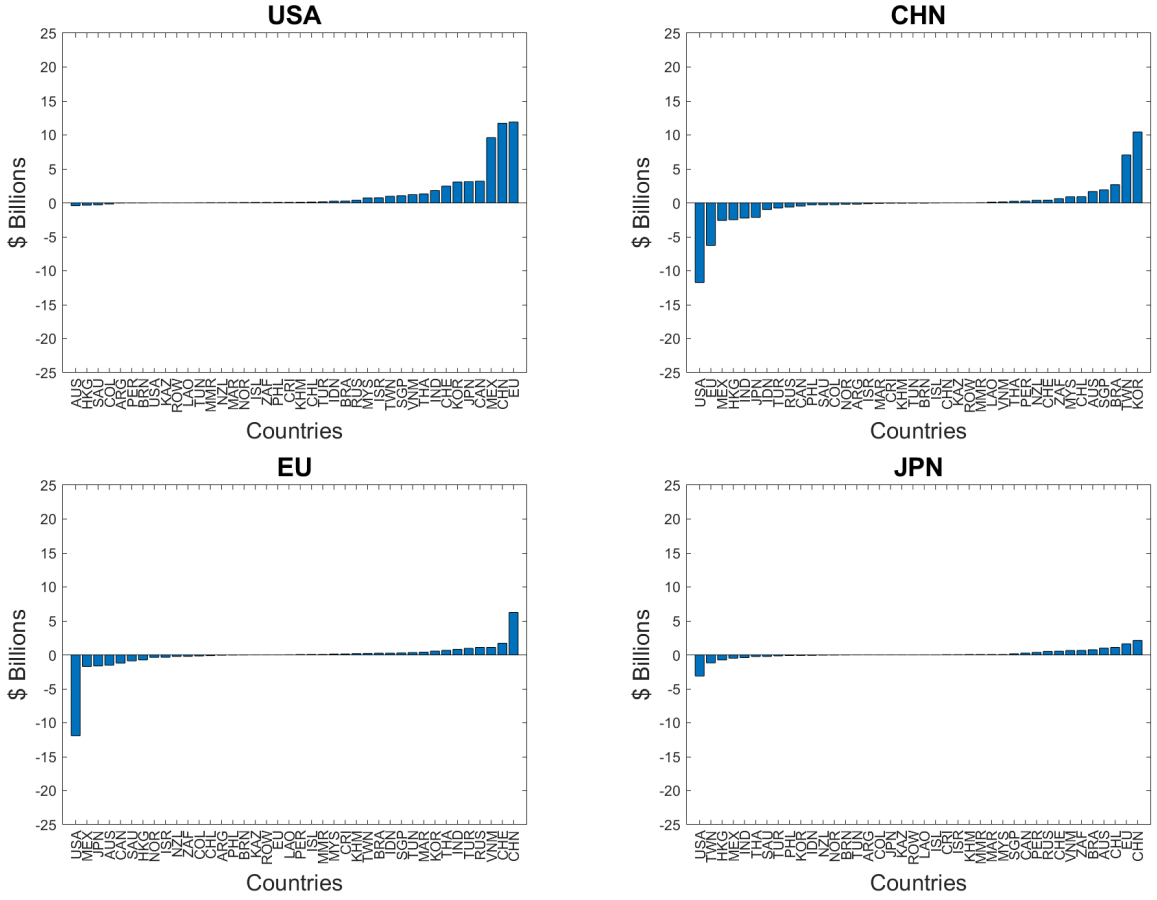
2.1 25% Uniform Tariffs

Figure 1: The ToT Effect of Tariff Cooperation between the U.S. and its Major Trading Partners (25% Noncooperative Tariffs)



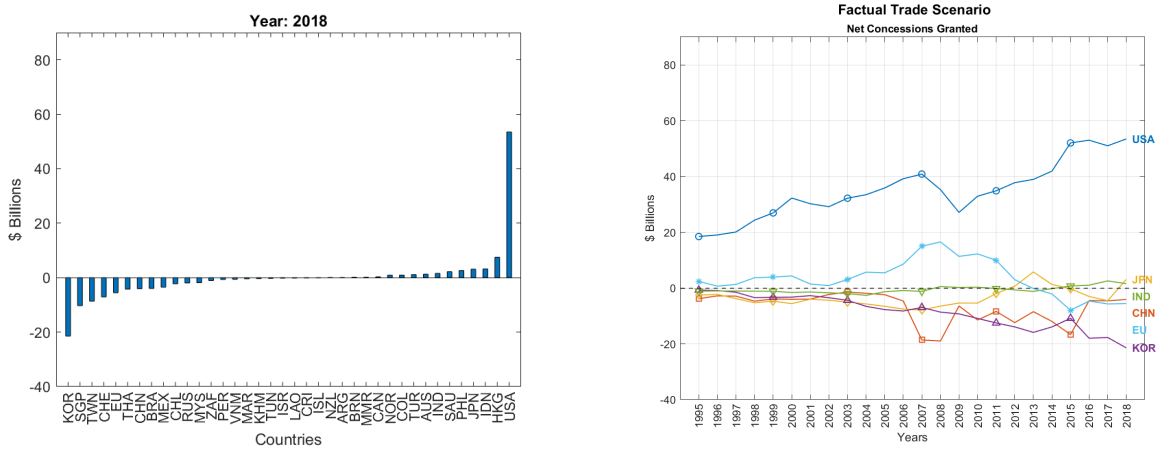
Note: Each panel illustrates the terms-of-trade effects of bilateral cooperation between the U.S. and one of its major trading partners. Blue (red) bars depict the magnitude of the effect on the U.S. (its partner). The black line depicts the net concessions granted by the U.S. to that partner, as defined in the main paper. The analysis is based on the goods-only model.

Figure 2: Net Bilateral Concessions Granted to Partners by Selected Countries in 2018 (25% Noncooperative Tariffs)



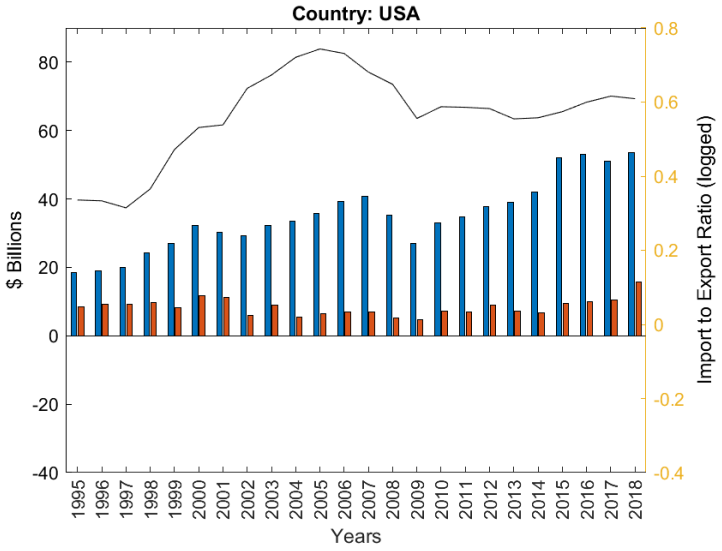
Note: The analysis is based on the goods-only model.

Figure 3: Net Multilateral Concessions Granted (25% Noncooperative Tariffs)



Note: The left panel depicts the net multilateral concessions granted by each country in 2018. The right panel depicts the same measure for selected countries from 1995 to 2018. The analysis is based on the goods-only model.

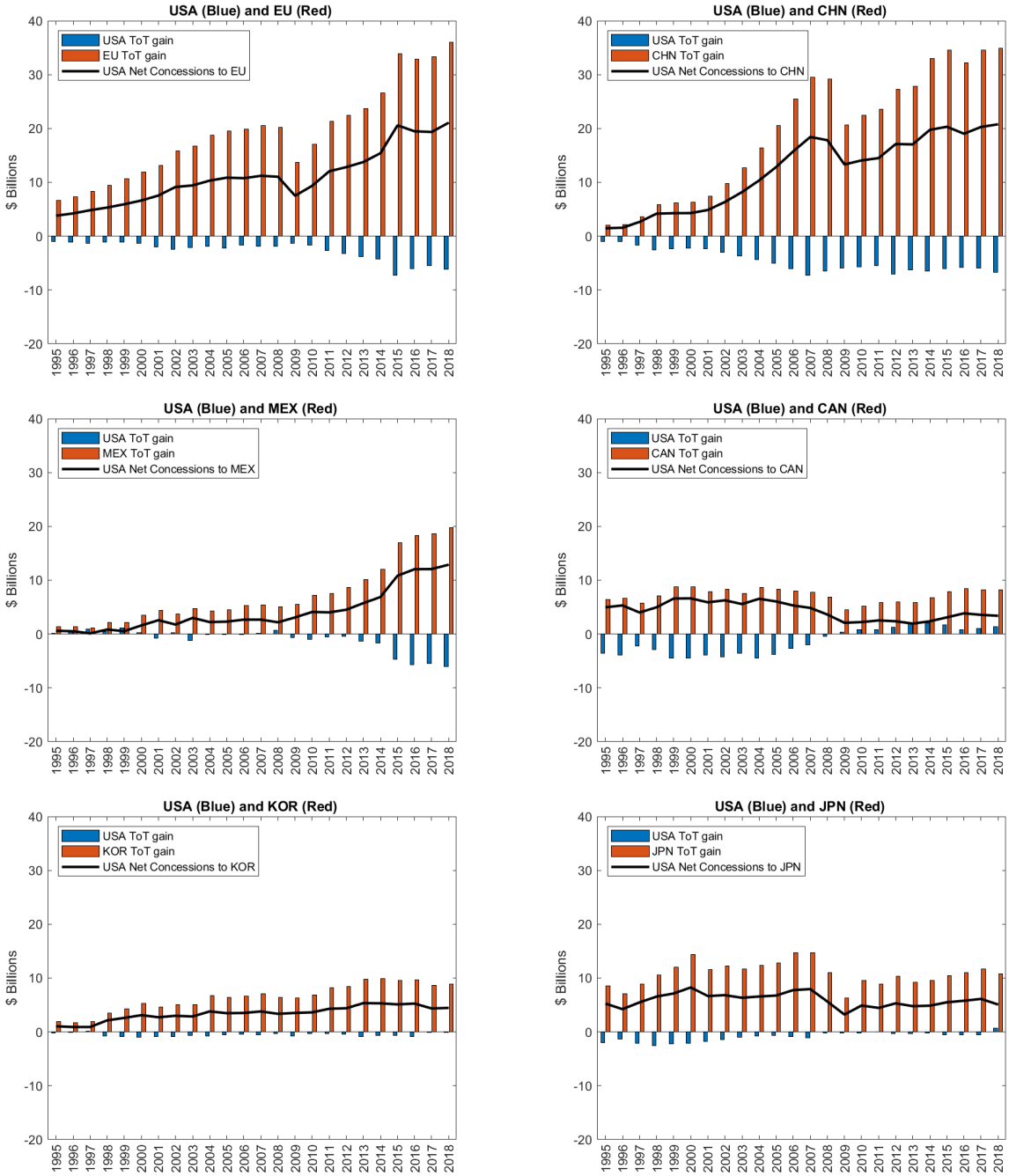
Figure 4: Net Multilateral Concessions of the United States (25% Noncooperative Tariffs) — The Role of Trade Imbalances



Note: The net concessions granted by the United States under the balanced-trade scenario (represented by red bars) are significantly lower compared to those under the factual trade flows (blue bars). The line graph, aligned with the right axis, displays the logarithmic ratio of U.S. imports to exports. The analysis is based on the goods-only model.

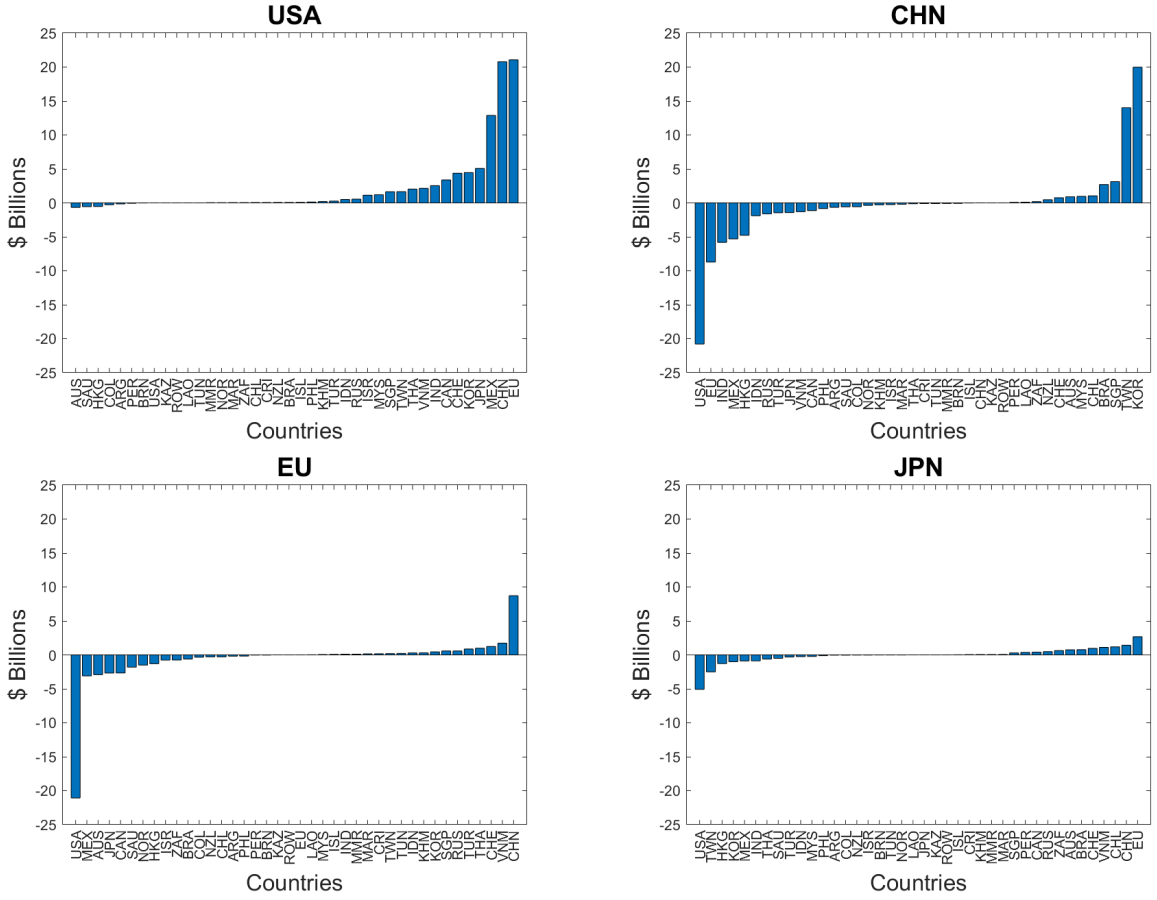
2.2 75% Uniform Tariffs

Figure 5: The ToT Effect of Tariff Cooperation between the U.S. and its Major Trading Partners (75% Noncooperative Tariffs)



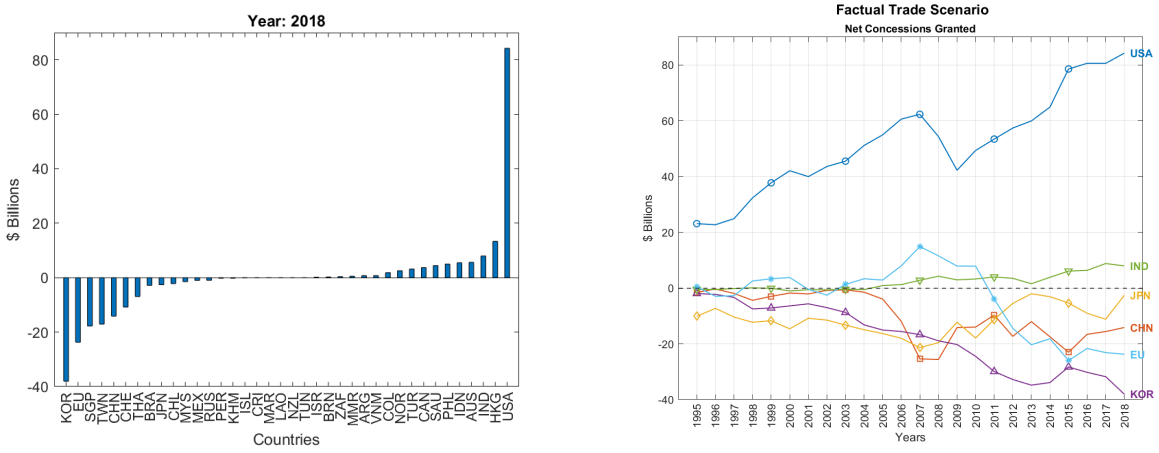
Note: Each panel illustrates the terms-of-trade effects of bilateral cooperation between the U.S. and one of its major trading partners. Blue (red) bars depict the magnitude of the effect on the U.S. (its partner). The black line depicts the net concessions granted by the U.S. to that partner, as defined in the main paper. The analysis is based on the goods-only model.

Figure 6: Net Bilateral Concessions Granted to Partners by Selected Countries in 2018 (75% Noncooperative Tariffs)



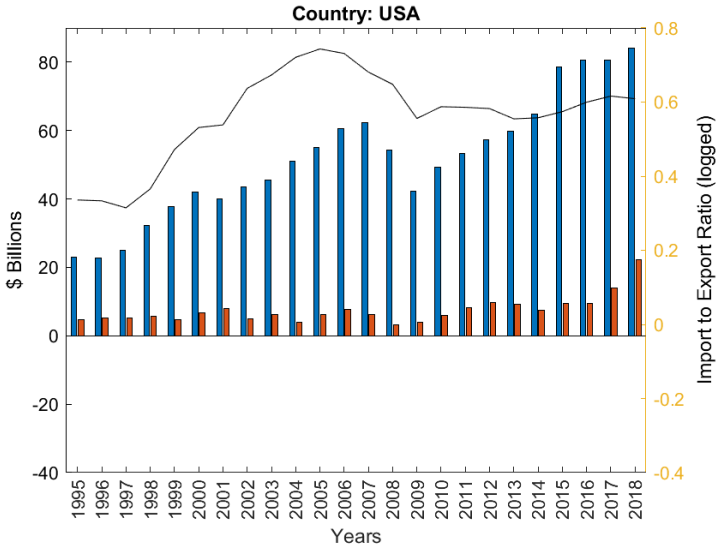
Note: The analysis is based on the goods-only model.

Figure 7: Net Multilateral Concessions Granted (75% Noncooperative Tariffs)



Note: The left panel depicts the net multilateral concessions granted by each country in 2018. The right panel depicts the same measure for selected countries from 1995 to 2018. The analysis is based on the goods-only model.

Figure 8: Net Multilateral Concessions of the United States (75% Noncooperative Tariffs) — The Role of Trade Imbalances



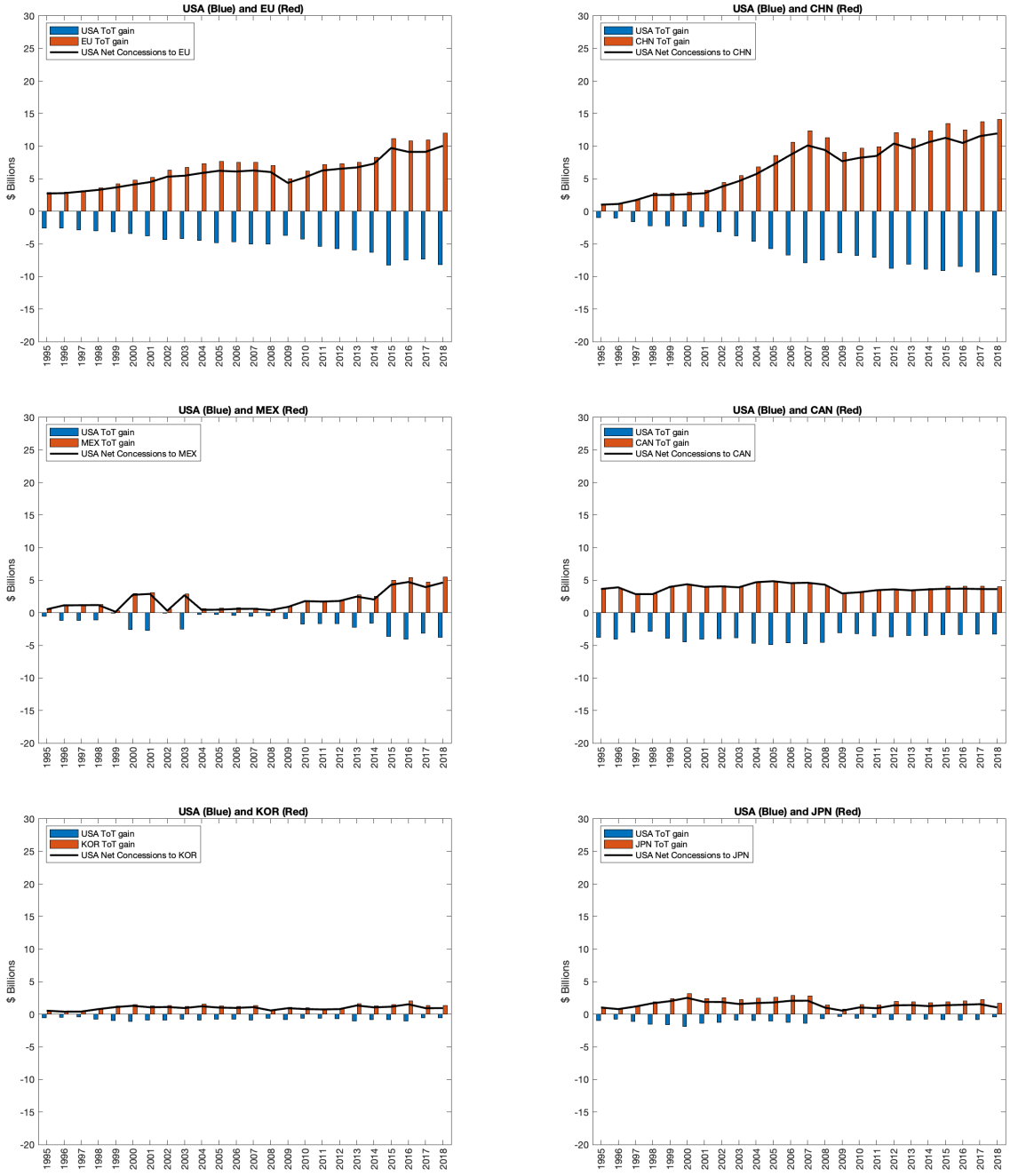
Note: The net concessions granted by the United States under the balanced-trade scenario (represented by red bars) are significantly lower compared to those under the factual trade flows (blue bars). The line graph, aligned with the right axis, displays the logarithmic ratio of U.S. imports to exports. The analysis is based on the goods-only model.

3 Alternative Noncooperative Benchmarks: IO Model

Section 2 above reports how the results in the goods-only model vary with the level of the disagreement tariff. This section reports the same set of figures computed under the IO model, across five disagreement-tariff benchmarks — the bilateral Nash tariffs, 25%, 50%, and 75% uniform tariffs, and 1990 applied tariffs. As in the main paper, the noncooperative tariff is set equal to the applied tariff in the oil sector and in sectors where the applied tariff exceeds the disagreement benchmark.

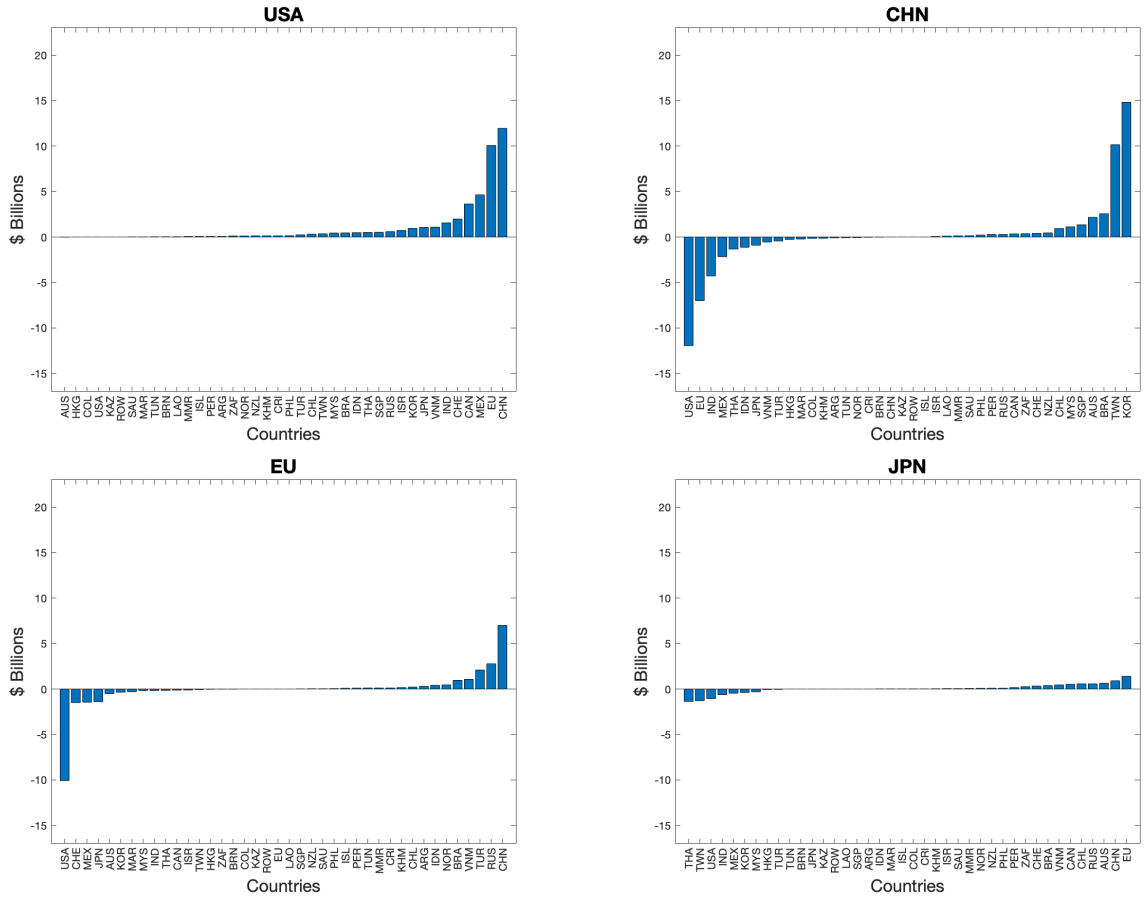
3.1 Bilateral Nash Tariffs

Figure 9: The ToT Effect of Tariff Cooperation between the U.S. and its Major Trading Partners (Bilateral Nash Noncooperative Tariffs) — IO Model



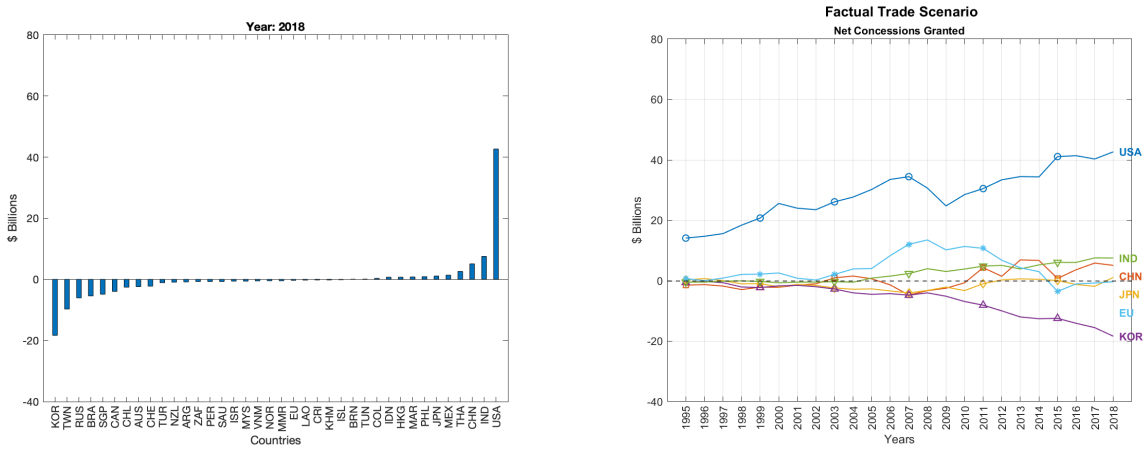
Note: Each panel illustrates the terms-of-trade effects of bilateral cooperation between the U.S. and one of its major trading partners. Blue (red) bars depict the magnitude of the effect on the U.S. (its partner). The black line depicts the net concessions granted by the U.S. to that partner, as defined in the main paper. The analysis is based on the model with input-output linkages.

Figure 10: Net Bilateral Concessions Granted to Partners by Selected Countries in 2018 (Bilateral Nash Noncooperative Tariffs) — IO Model



Note: The analysis is based on the model with input-output linkages.

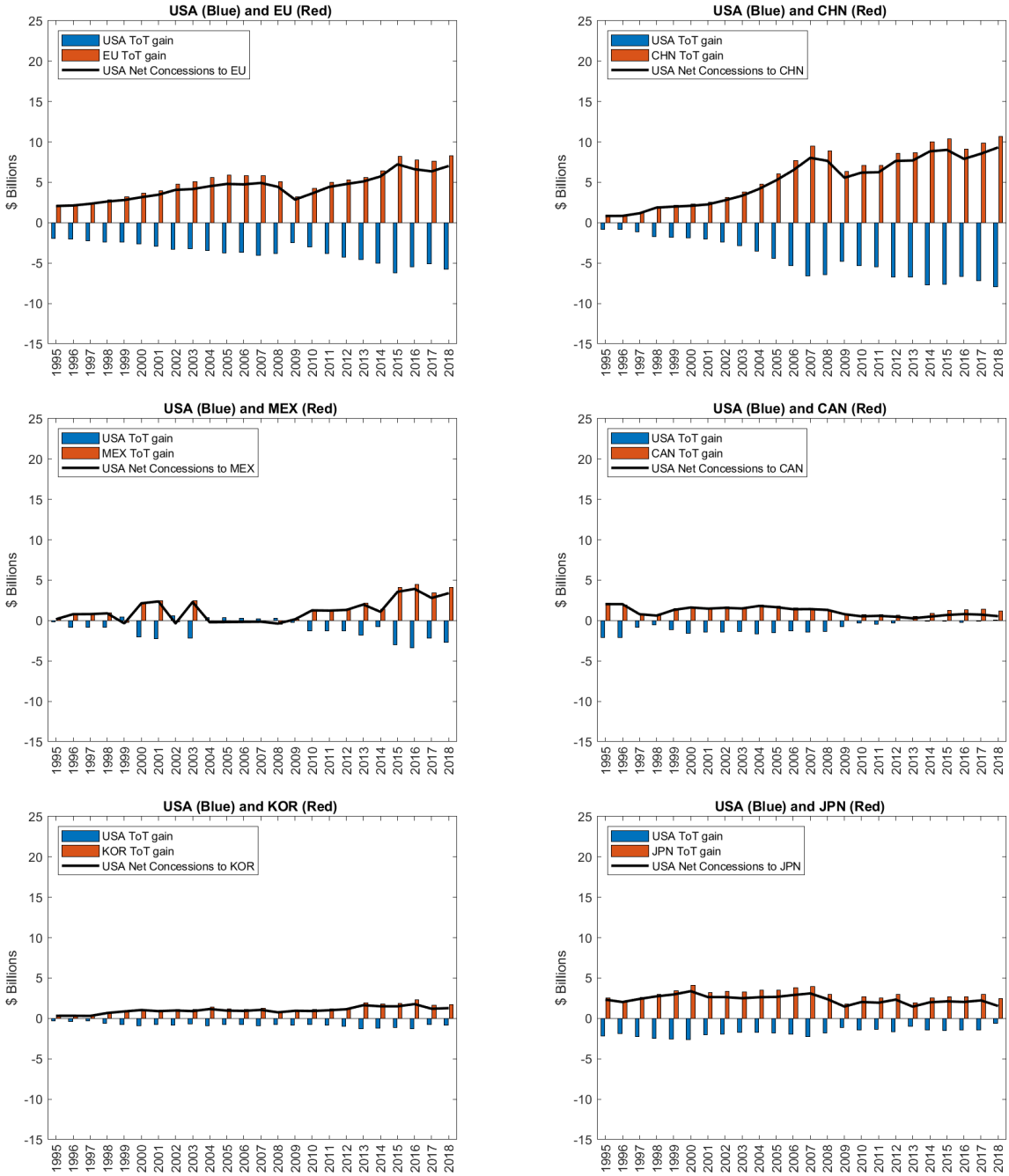
Figure 11: Net Multilateral Concessions Granted (Bilateral Nash Noncooperative Tariffs) — IO Model



Note: The left panel depicts the net multilateral concessions granted by each country in 2018. The right panel depicts the same measure for selected countries from 1995 to 2018. The analysis is based on the model with input-output linkages.

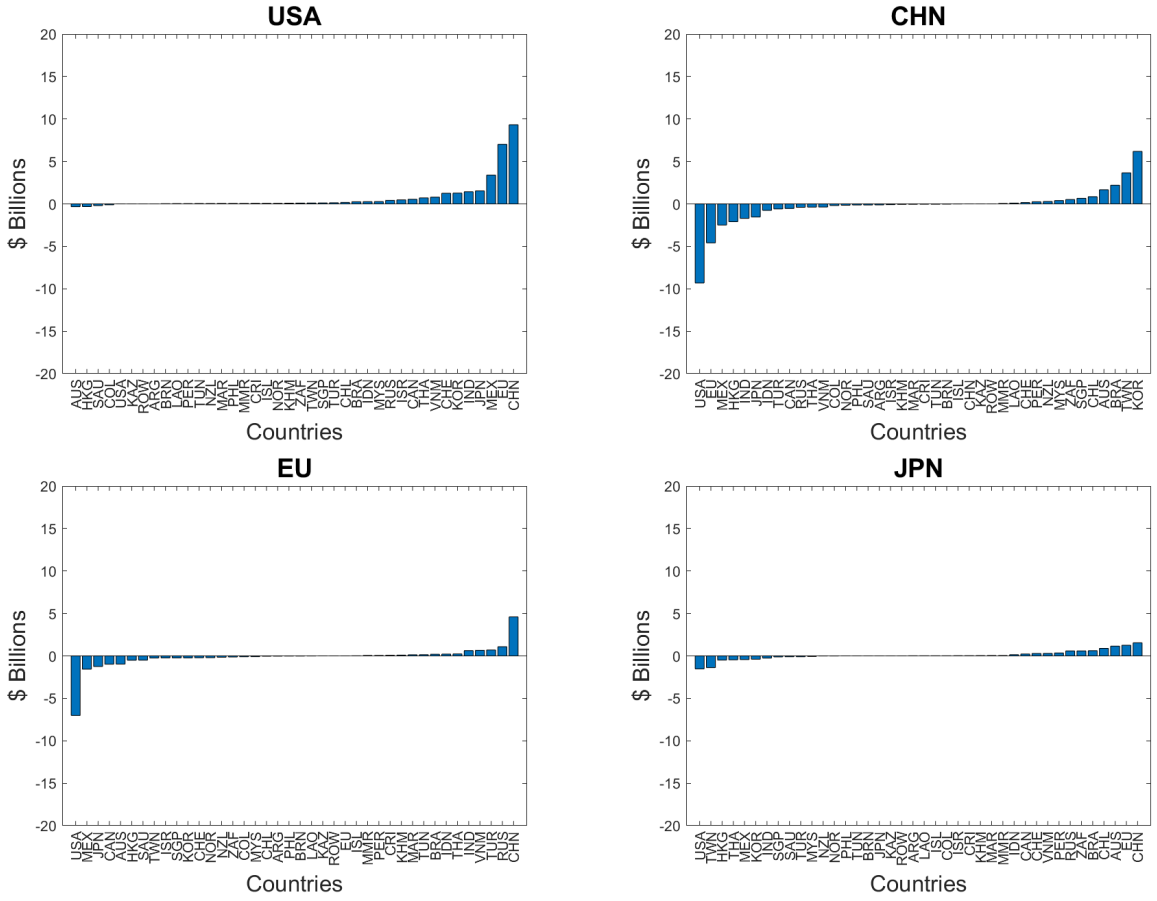
3.2 25% Uniform Tariffs

Figure 12: The ToT Effect of Tariff Cooperation between the U.S. and its Major Trading Partners (25% Noncooperative Tariffs) — IO Model



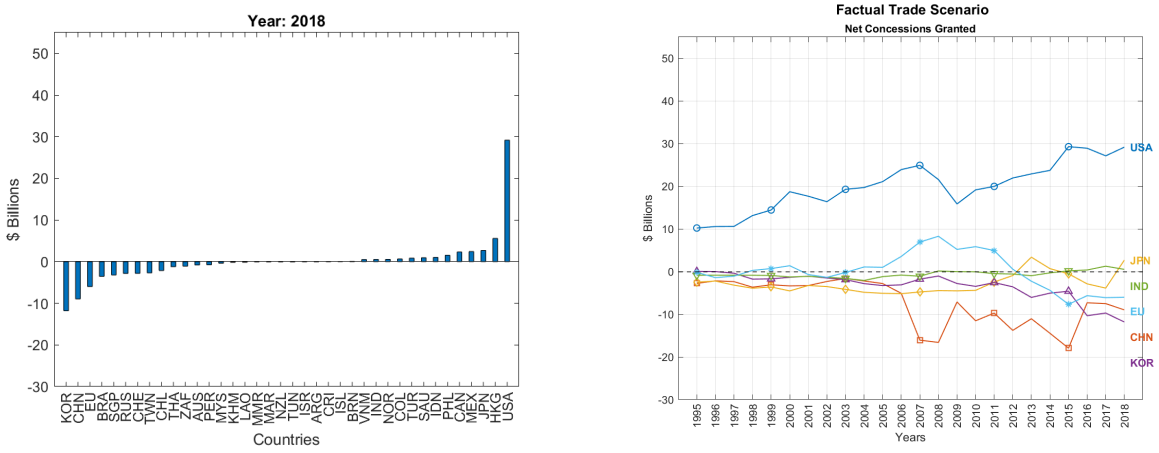
Note: Each panel illustrates the terms-of-trade effects of bilateral cooperation between the U.S. and one of its major trading partners. Blue (red) bars depict the magnitude of the effect on the U.S. (its partner). The black line depicts the net concessions granted by the U.S. to that partner, as defined in the main paper. The analysis is based on the model with input-output linkages.

Figure 13: Net Bilateral Concessions Granted to Partners by Selected Countries in 2018 (25% Noncooperative Tariffs) — IO Model



Note: The analysis is based on the model with input-output linkages.

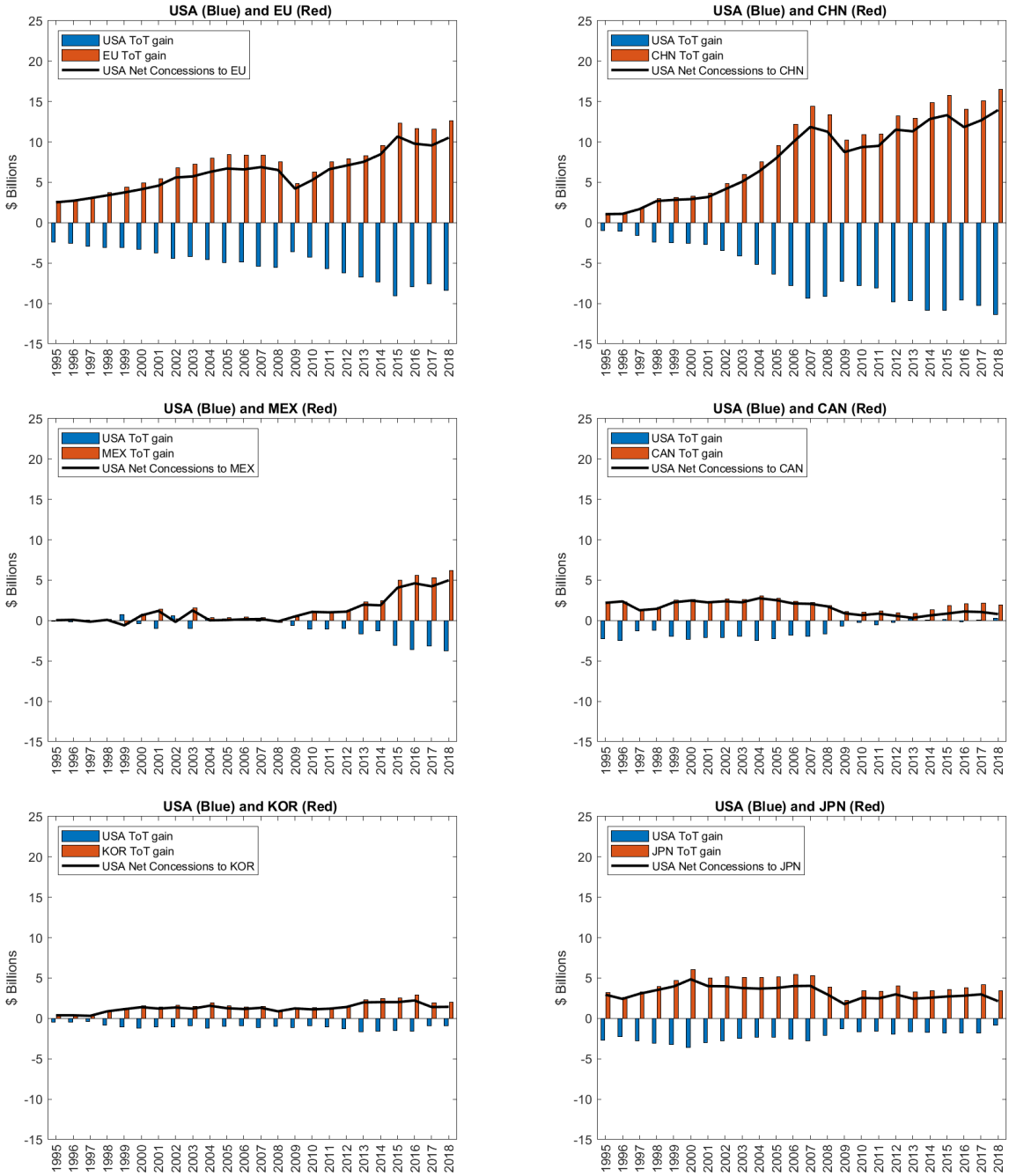
Figure 14: Net Multilateral Concessions Granted (25% Noncooperative Tariffs) — IO Model



Note: The left panel depicts the net multilateral concessions granted by each country in 2018. The right panel depicts the same measure for selected countries from 1995 to 2018. The analysis is based on the model with input-output linkages.

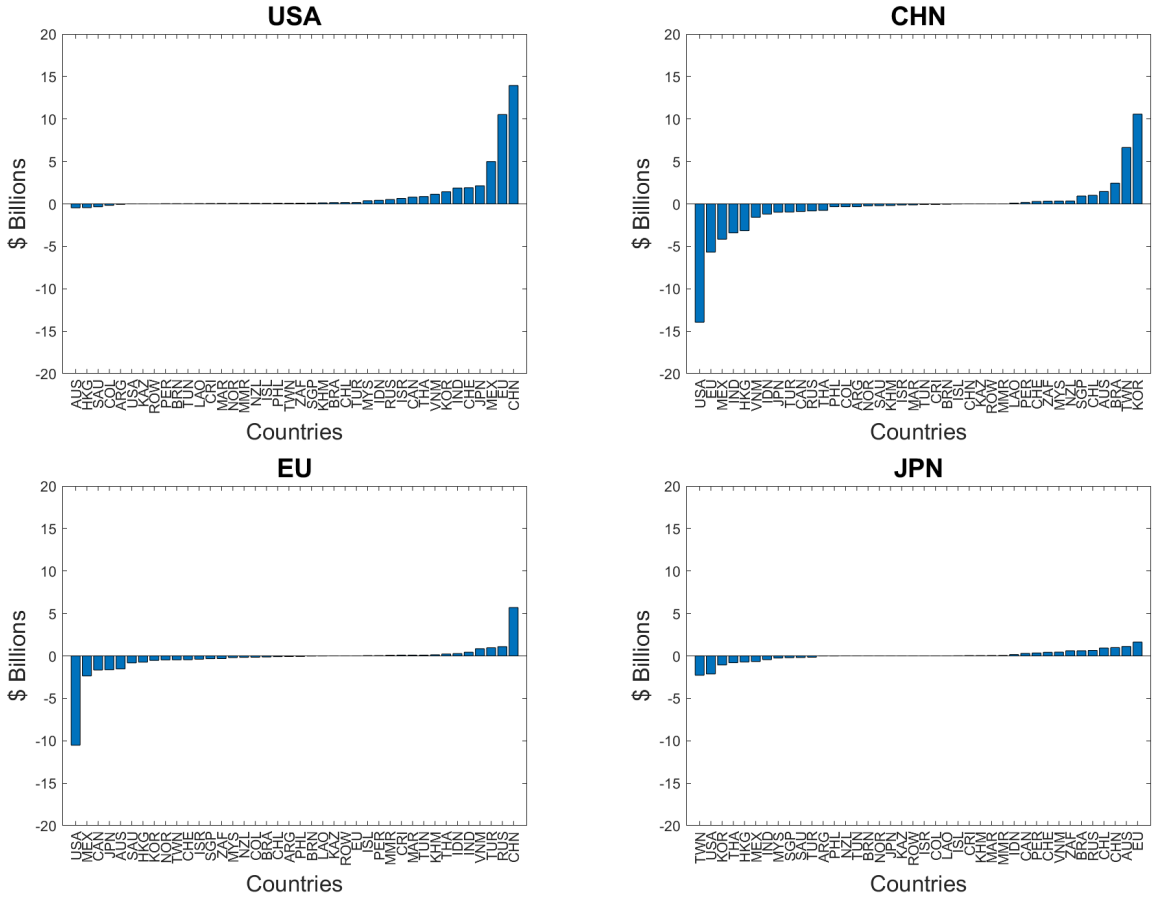
3.3 50% Uniform Tariffs

Figure 15: The ToT Effect of Tariff Cooperation between the U.S. and its Major Trading Partners (50% Noncooperative Tariffs) — IO Model



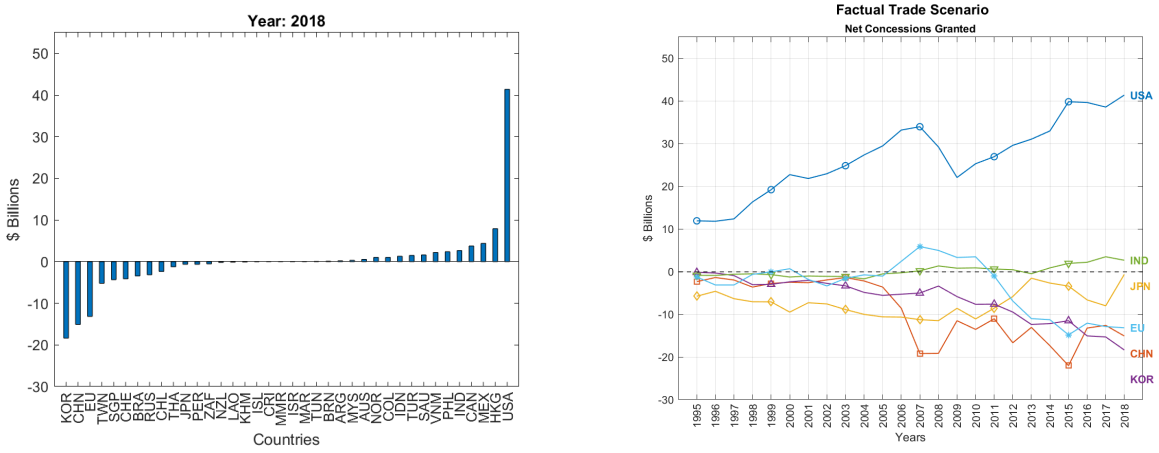
Note: Each panel illustrates the terms-of-trade effects of bilateral cooperation between the U.S. and one of its major trading partners. Blue (red) bars depict the magnitude of the effect on the U.S. (its partner). The black line depicts the net concessions granted by the U.S. to that partner, as defined in the main paper. The analysis is based on the model with input-output linkages.

Figure 16: Net Bilateral Concessions Granted to Partners by Selected Countries in 2018 (50% Noncooperative Tariffs) — IO Model



Note: The analysis is based on the model with input-output linkages.

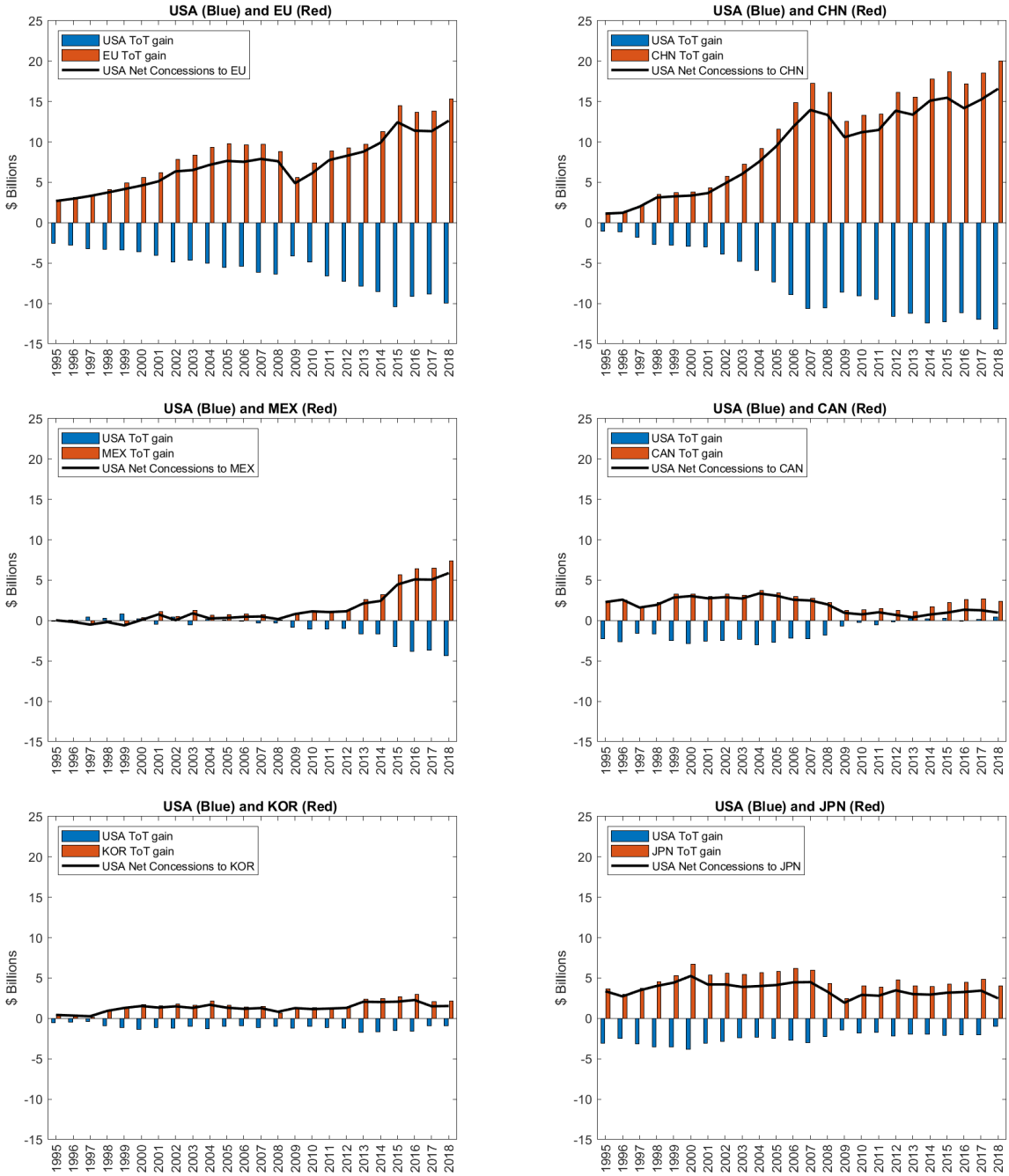
Figure 17: Net Multilateral Concessions Granted (50% Noncooperative Tariffs) — IO Model



Note: The left panel depicts the net multilateral concessions granted by each country in 2018. The right panel depicts the same measure for selected countries from 1995 to 2018. The analysis is based on the model with input-output linkages.

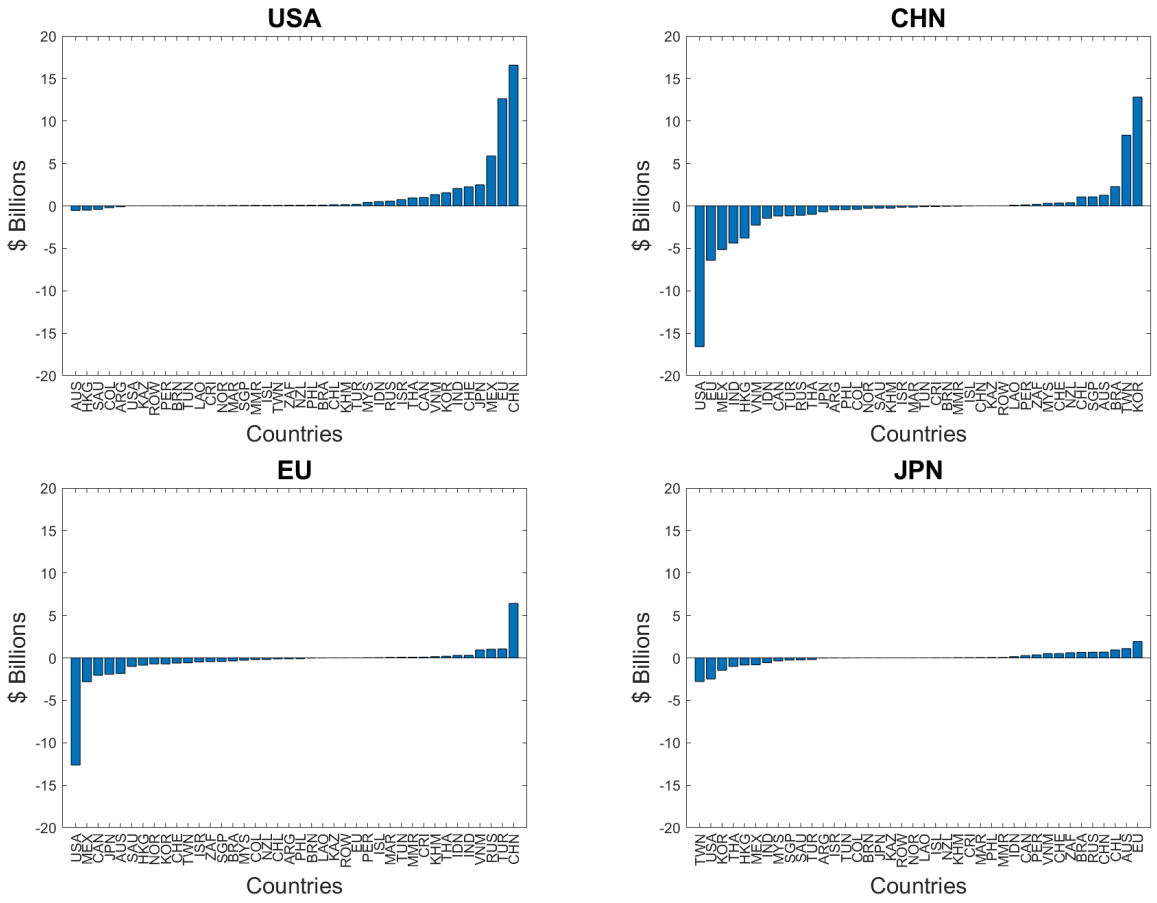
3.4 75% Uniform Tariffs

Figure 18: The ToT Effect of Tariff Cooperation between the U.S. and its Major Trading Partners (75% Noncooperative Tariffs) — IO Model



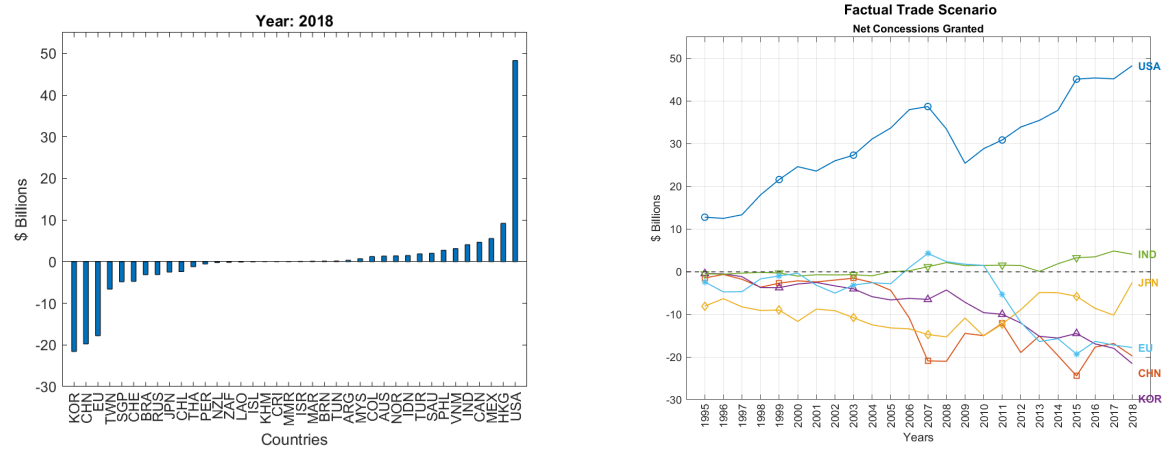
Note: Each panel illustrates the terms-of-trade effects of bilateral cooperation between the U.S. and one of its major trading partners. Blue (red) bars depict the magnitude of the effect on the U.S. (its partner). The black line depicts the net concessions granted by the U.S. to that partner, as defined in the main paper. The analysis is based on the model with input-output linkages.

Figure 19: Net Bilateral Concessions Granted to Partners by Selected Countries in 2018 (75% Noncooperative Tariffs) — IO Model



Note: The analysis is based on the model with input-output linkages.

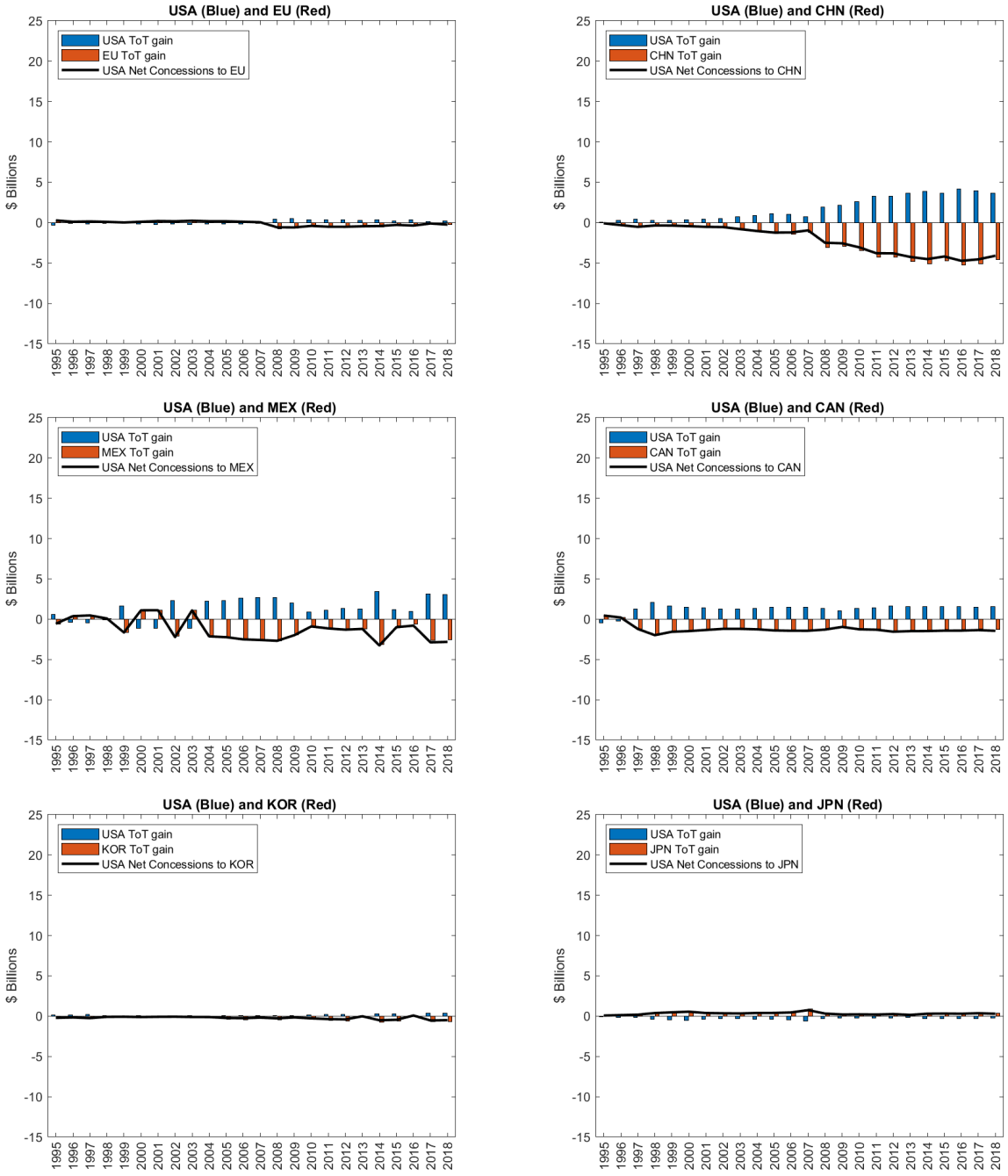
Figure 20: Net Multilateral Concessions Granted (75% Noncooperative Tariffs) — IO Model



Note: The left panel depicts the net multilateral concessions granted by each country in 2018. The right panel depicts the same measure for selected countries from 1995 to 2018. The analysis is based on the model with input-output linkages.

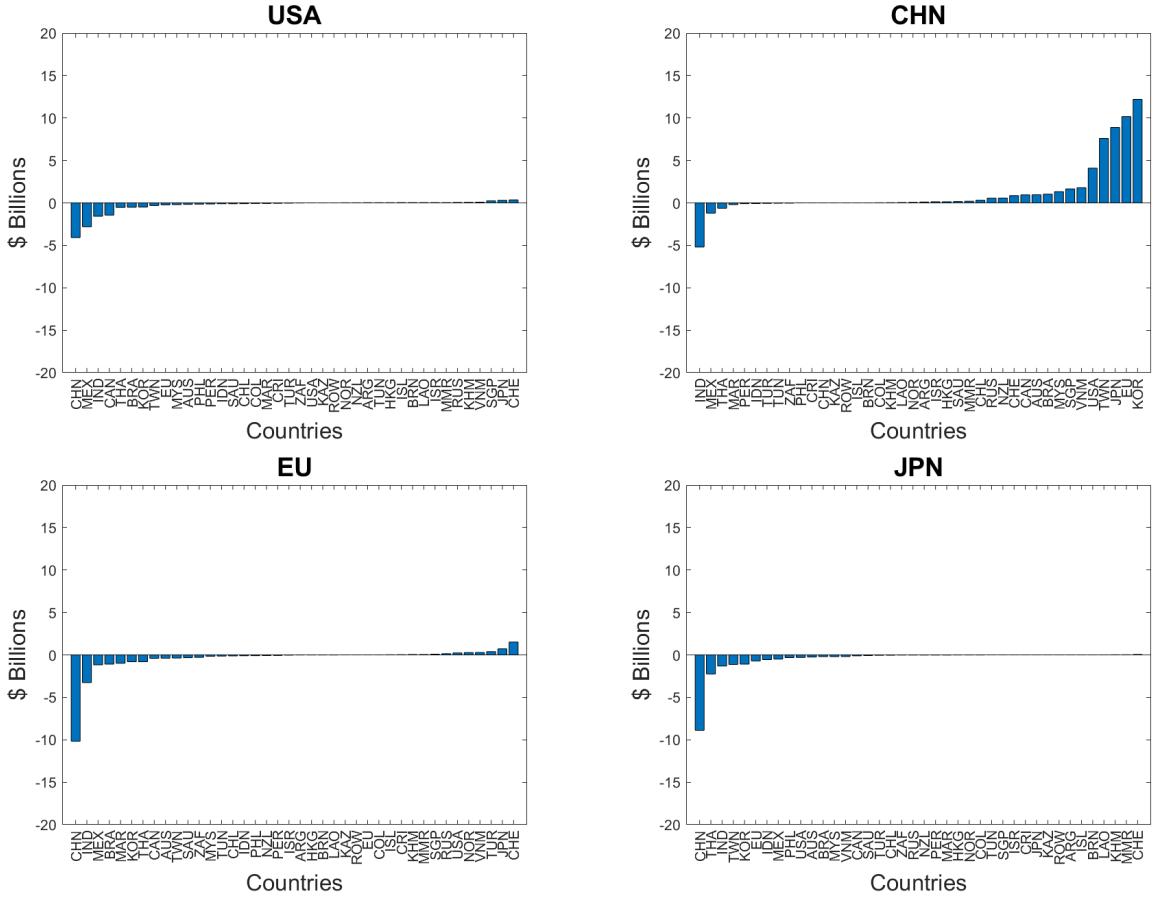
3.5 1990 Applied Tariffs

Figure 21: The ToT Effect of Tariff Cooperation between the U.S. and its Major Trading Partners (1990 Applied Tariffs as Noncooperative Tariffs) — IO Model



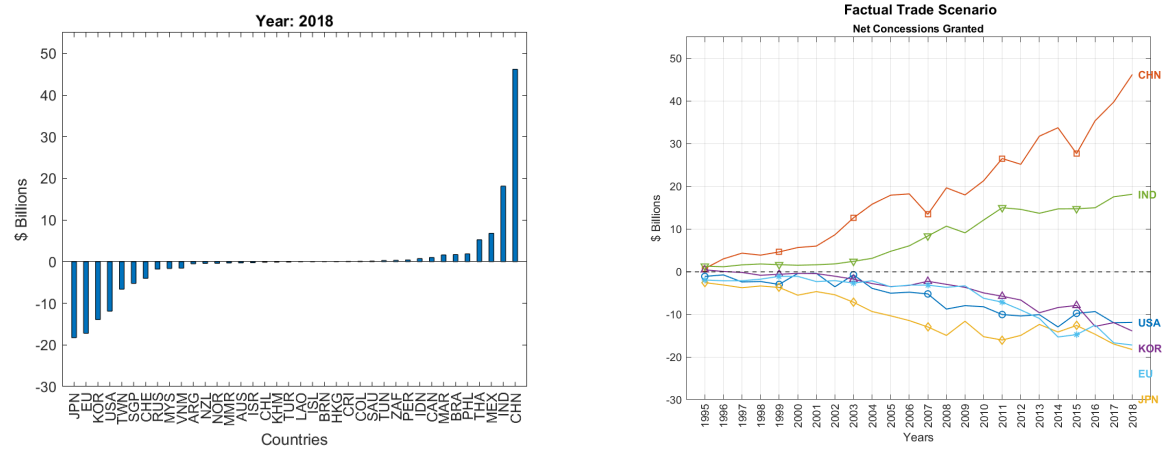
Note: Each panel illustrates the terms-of-trade effects of bilateral cooperation between the U.S. and one of its major trading partners. Blue (red) bars depict the magnitude of the effect on the U.S. (its partner). The black line depicts the net concessions granted by the U.S. to that partner, as defined in the main paper. The analysis is based on the model with input-output linkages.

Figure 22: Net Bilateral Concessions Granted to Partners by Selected Countries in 2018 (1990 Applied Tariffs as Noncooperative Tariffs) — IO Model



Note: The analysis is based on the model with input-output linkages.

Figure 23: Net Multilateral Concessions Granted (1990 Applied Tariffs as Noncooperative Tariffs) — IO Model



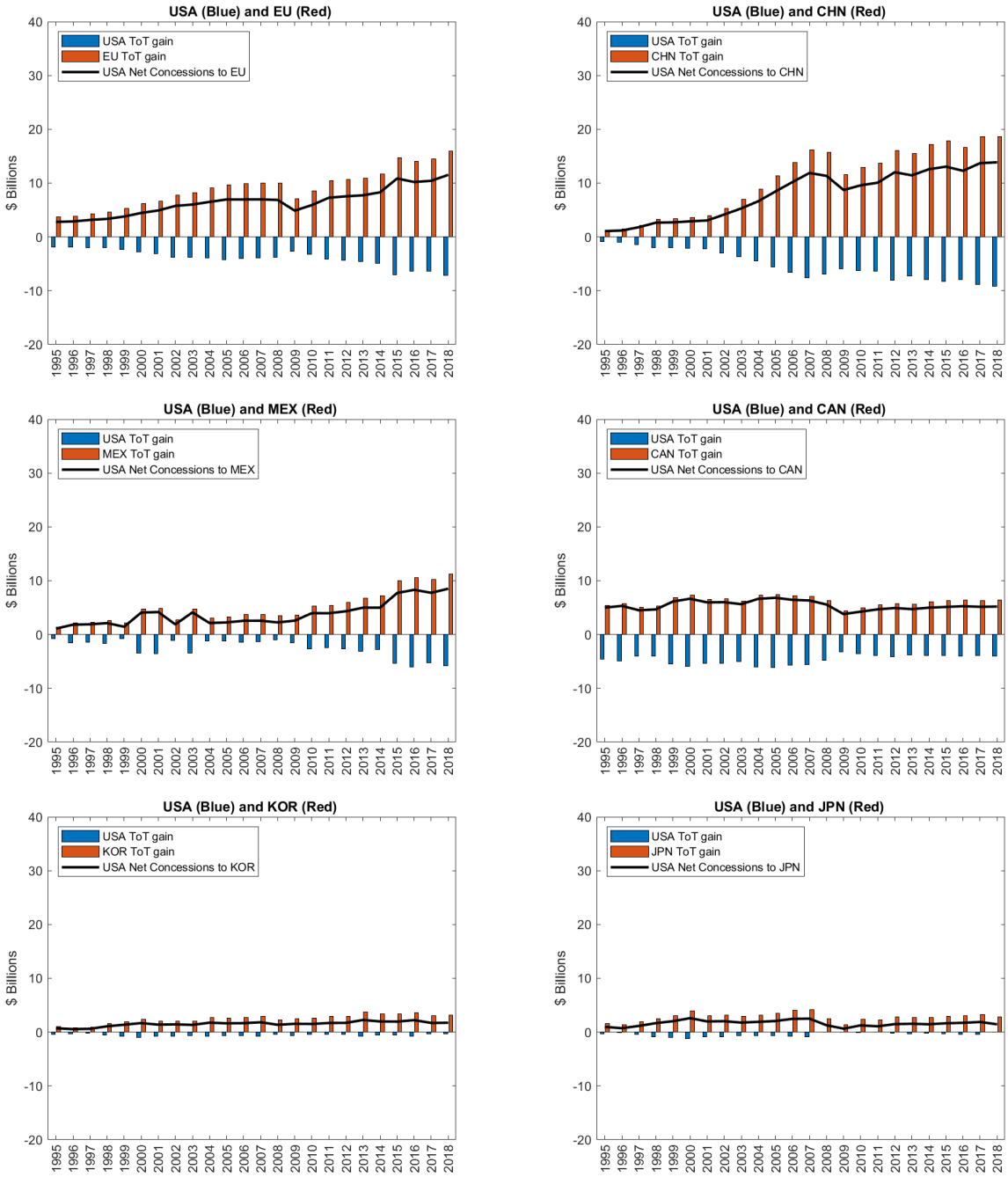
Note: The left panel depicts the net multilateral concessions granted by each country in 2018. The right panel depicts the same measure for selected countries from 1995 to 2018. The analysis is based on the model with input-output linkages.

4 Alternative Model: Goods and Services (No Input–Output Linkages)

This section reports the same set of figures as in Section 3.1 for the bilateral Nash noncooperative tariff benchmark, computed instead under the model with goods and services but without input-output linkages (see also Figure E.1 in the main paper, whose left panel corresponds to this model).

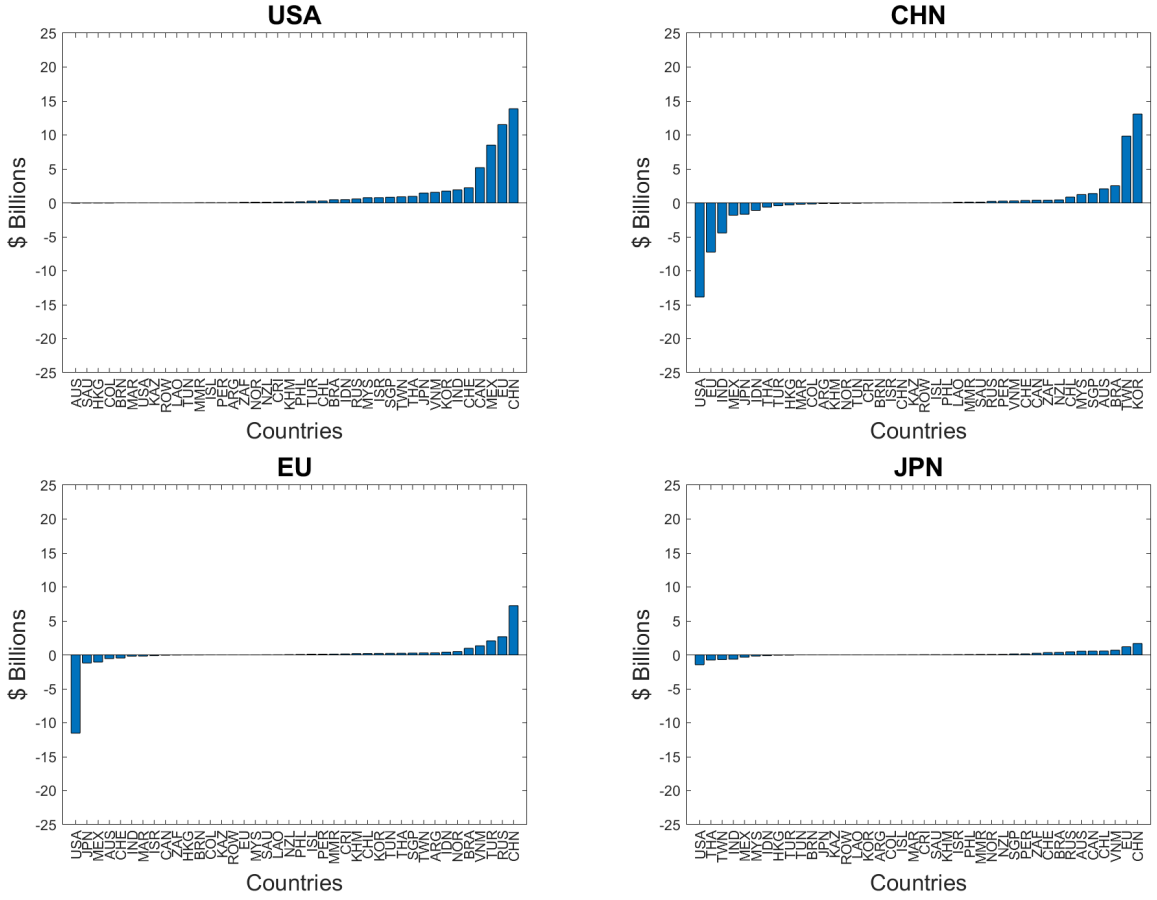
4.1 Bilateral Nash Tariffs

Figure 24: The ToT Effect of Tariff Cooperation between the U.S. and its Major Trading Partners (Bilateral Nash Noncooperative Tariffs) — Model with Goods and Services



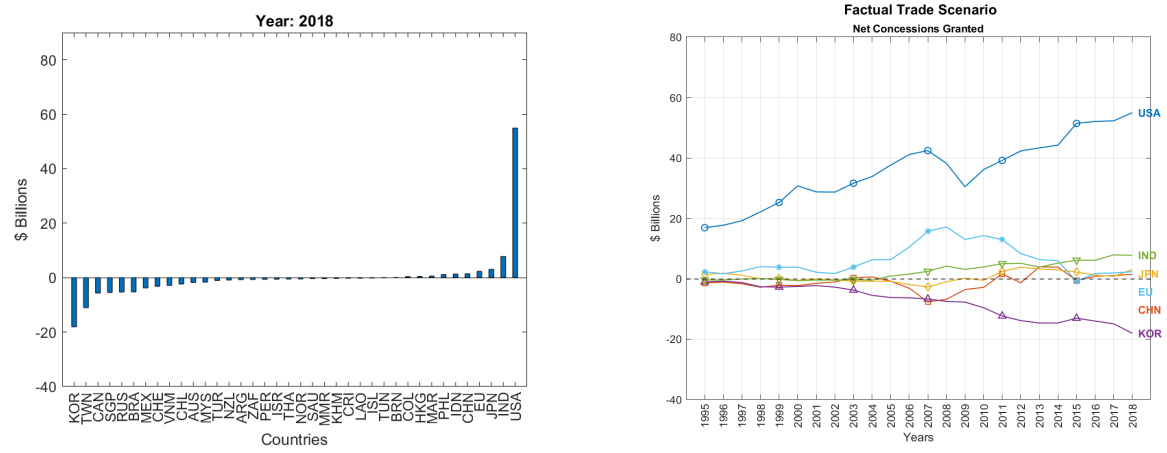
Note: Each panel illustrates the terms-of-trade effects of bilateral cooperation between the U.S. and one of its major trading partners. Blue (red) bars depict the magnitude of the effect on the U.S. (its partner). The black line depicts the net concessions granted by the U.S. to that partner, as defined in the main paper. The analysis is based on the model with goods and services (no input-output linkages).

Figure 25: Net Bilateral Concessions Granted to Partners by Selected Countries in 2018 (Bilateral Nash Noncooperative Tariffs) — Model with Goods and Services



Note: The analysis is based on the model with goods and services (no input-output linkages).

Figure 26: Net Multilateral Concessions Granted (Bilateral Nash Noncooperative Tariffs) — Model with Goods and Services



Note: The left panel depicts the net multilateral concessions granted by each country in 2018. The right panel depicts the same measure for selected countries from 1995 to 2018. The analysis is based on the model with goods and services (no input-output linkages).

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