

***UNITED STATES – CERTAIN METHODOLOGIES AND THEIR APPLICATION TO
ANTI-DUMPING PROCEEDINGS INVOLVING CHINA***

Recourse to Article 22.6 of the DSU by the United States

(DS471)

**RESPONSES OF THE UNITED STATES OF AMERICA
TO THE ADVANCE QUESTIONS FROM THE ARBITRATOR**

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USA-68	Paul S. Armington, <i>A Theory of Demand for Products Distinguished by Place of Production</i> , Vol. 1, No.1, International Monetary Fund (March 1969)
USA-69	James E. Anderson, <i>A Theoretical Foundation for the Gravity Equation</i> , American Economic Review, 69 (1), 106-116 (1979)
USA-70	Robert C. Feenstra, <i>New Product Varieties and the Measurement of International Prices</i> , American Economic Review, Vol. 84, No. pp. 157-177 (March 1994)
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USA-73	<i>Crystalline Silicon Photovoltaic Cells, Whether or Not Assembled Into Modules, from the People’s Republic of China: Amended Final Results of Antidumping Duty Administrative Review; 2014-2015</i> , 82 Fed. Reg. 40,560 (August 25, 2017)
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1 GENERAL

1. China states that it "has decided to remove the Aluminum Extrusions case from its N/I calculation."

- a. **To China: If the Arbitrator were to follow China's proposed approach for determining the level of nullification or impairment, is the Arbitrator correct in understanding that it should base its determination on the remaining 24 cases only?**
- b. **To the United States: If the Arbitrator were to follow the United States' proposed approach for determining the level of nullification or impairment, is the Arbitrator correct in understanding that it should base its determination on all 25 cases, including *Aluminum Extrusions*?**

Response:

1. As the complaining party in this dispute, China submitted to the Arbitrator a methodology paper explaining the basis for its request to suspend concessions or other obligations in this dispute. In its methodology paper, China identified 13 antidumping duty orders in connection with its "as applied" claims concerning the Single Rate Presumption, including *Aluminum Extrusions*. By removing *Aluminum Extrusions*¹ from its estimation of the level of nullification or impairment, China is amending the basis for its request to suspend concessions, and is, in effect, conceding that the U.S. objection to the level China proposed to the DSB is well-founded.

2. Nothing precludes China from amending the basis for its request and, in effect, confirming to the Arbitrator that the level it had proposed is not equivalent to the nullification or impairment.² Accordingly, following China's proposed approach, the Arbitrator should exclude the *Aluminum Extrusions* antidumping order and only consider the remaining 24 antidumping orders in estimating the level of nullification or impairment.

2 COUNTERFACTUAL

2.2 United States' Proposed Counterfactual

3. **To the United States: The original Panel found that the USDOC's Single Rate Presumption is inconsistent with the obligation to calculate an individual dumping margin for each known exporter or producer (under Article 6.10 of the Anti-Dumping Agreement) and to assign an individual anti-dumping duty for each supplier (under Article 9.2 of the Anti-Dumping Agreement). The United States**

¹ See China's Written Submission, footnotes 35, 60, 74, 83.

² See DSU Art. 22.7 ("The arbitrator acting pursuant to paragraph 6 shall not examine the nature of the concessions or other obligations to be suspended but shall determine whether the level of such suspension is equivalent to the level of nullification or impairment.") (footnote omitted).

contends that the appropriate counterfactual is the reduction of the anti-dumping duty rate for cooperating exporters in the PRC-wide entity (which it refers to as Group 4 companies) from the PRC-wide rate to the all-others rate.

- a. The United States distinguishes Group 4 companies from Group 3 companies, which are alleged non-cooperating exporters or producers within the PRC-wide entity. The United States relies on this distinction in applying the proposed formula-based approach for two out of five cases but does not appear to rely on this distinction in applying the proposed Armington-based model, instead using the all-others rate as the counterfactual for all exporters or producers included in the PRC-wide entity. Is the Arbitrator correct in understanding that the distinction between Group 3 companies and Group 4 companies is not relevant under the Armington-based model? Please clarify.**

Response:

3. The distinction between Group 3 companies and Group 4 companies is equally relevant under both the formula-based and the Armington-based approaches. Due to limitations in CBP's data, however, the United States was not able to apply this distinction in its calculations using the Armington-based approach. Specifically, CBP assesses and collects cash deposits of antidumping duties at the China-government entity rate on imports from Chinese firms which do not have their own company-specific rates. CBP's data on the China-government rate, therefore, includes Chinese imports that fall under both Group 3 and Group 4. Thus, the U.S. estimate of the level of nullification or impairment applying the Armington-based approach necessarily overstates the level of nullification or impairment to a certain degree.

- b. The United States' proposed counterfactual appears to assume that the exporters or producers within the PRC-wide entity would not be entitled to individual rates, had they not been included in the PRC-wide entity under the Single Rate Presumption.**

- i. Why is it plausible or reasonable to assume that the USDOC would comply with the original Panel's findings by giving exporters or producers within the PRC-wide entity the all-others rate, rather than an individual rate?**

Response:

4. The U.S. proposed counterfactual would comply with the findings adopted by the DSB. The original panel specifically found the Single Rate Presumption to be WTO-inconsistent "because it subjects NME exporters to a single dumping margin and duty rate, unless each exporter overcomes the presumption."³ The original panel further found that the USDOC "failed to make an objective affirmative determination that the multiple exporters included within the PRC-wide entity were in such a relationship that they should be treated as a single

³ See Panel Report, *US – Methodologies (China)*, para. 7.367.

entity.”⁴ These findings do not implicate the issue of whether firms in the China-government entity would, in the absence of the Single Rate Presumption, be entitled to an individual rate as compared with some other rate; for example, a rate assigned to companies that were not individually examined or a rate based on facts available. Therefore, the DSB’s findings do not require that the USDOC apply an individual rate to every single exporter or producer subject to the China-government entity rate, nor is it necessary or appropriate to assume that the USDOC would do so for purposes of constructing a counterfactual to estimate the level of nullification or impairment.

5. In 22 out of the 24 cases at issue in China’s methodology paper and written submission, the USDOC conducted respondent selection and individually examined a limited number of producers/exporters in those investigations.⁵ In its original requests for consultations and for the establishment of a panel, China did not challenge the USDOC’s decision to limit its examination due to the large number of producers and exporters. Accordingly, it is reasonable for purposes of this Article 22.6 arbitration to employ a counterfactual in which an antidumping duty rate other than an individually determined rate is assigned to companies that were not individually examined, which were part of the China-government entity but did not fail to cooperate.

6. In two proceedings – *Cold-Rolled Steel Flat Products* and *Large Residential Washers* – the USDOC did not limit its examination of individual respondents. In *Cold-Rolled Steel Flat Products*, no party submitted quantity and value questionnaire responses to the USDOC. Thus, the USDOC did not address the issue of whether to limit individual examination where no party cooperated in the proceeding.⁶ However, based on the facts in *Cold-Rolled Steel Flat Products*, a rate based on facts available (due to the failure to cooperate) could have applied even if the producers and/or exporters were not part of the China-government entity. In *Large Residential Washers*, the evidence of record indicated that only two exporters and/or producers existed. Therefore, the USDOC individually examined all known exporters and/or producers, and the use of a rate derived from the two known, and individually examined, exporters and/or producers is appropriate.⁷

⁴ See Panel Report, *US – Methodologies (China)*, para. 7.382.

⁵ See *Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994* (Antidumping Agreement), Article 6.10 (“In cases where the number of exporters, producers, importers or types of products involved is so large as to make such a determination impracticable, the authorities may limit their examination either to a reasonable number of interested parties or products by using . . . the largest percentage of the volume of the exports from the country in question which can reasonably be investigated.”); U.S. Federal Register Notices Regarding Preliminary Determinations in Antidumping Investigations, (Exhibit USA-51); U.S. Federal Register Notices Regarding Final Determinations in Antidumping Investigations, (Exhibit USA-50); see also *Cold-Rolled Steel Flat Products from China*, Preliminary Determination, Letter U, (explaining that USDOC did not receive quantity and value questionnaires from any potential respondents and, thus, did not conduct respondent selection) (Exhibit USA-51); *Large Residential Washers from China*, Preliminary Determination, Letter Y, (explaining that the USDOC was investigating all known exporters and/or producers, of which there were two) (Exhibit USA-51).

⁶ See *Cold-Rolled Steel Flat Products from China*, Preliminary Determination, Letter U, (Exhibit USA-51)

⁷ *Large Residential Washers from China*, Preliminary Determination, (Exhibit USA-51)

7. As a technical matter, the United States does not call the rate assigned to the companies that were found to be eligible for a separate rate but were not individually examined an “all-others” rate. Rather, this rate is considered a rate applied to separate-rate respondents that were not selected for individual examination, and the United States has referred to such a rate as the “separate duty rate”.

8. As noted in the U.S. written submission, China’s key assumption – that the counterfactual requires the removal of all antidumping duties – is incorrect. Those U.S. antidumping duties which were not found to be WTO-inconsistent – *i.e.*, duties on Chinese imports from firms to which individual duty rates apply that were not found to involve a WTO inconsistency; duties on Chinese imports from firms that were not individually examined yet received a “separate duty rate”; and duties on Chinese imports from firms that are subject to the China-government entity rate and failed to cooperate and, therefore, otherwise could have received a dumping rate based on facts available – have no impact on the level of nullification or impairment. It is only the imports from those firms that are subject to the China-government entity rate that have not failed to cooperate with the USDOC’s investigations that should be taken into account in determining the level of nullification or impairment. The United States has referred to these firms as “Group 4” in the U.S. written submission.⁸ “Group 4” firms included in the China-government entity were either (1) certain known companies not selected for individual examination or (2) unknown companies not selected for individual examination.

9. In light of the USDOC’s limited individual examination in the vast majority of the investigations identified by China, and because the DSB’s findings do not require that the USDOC examine and determine an individual rate for all exporters and/or producers of the subject merchandise that were part of the China-government entity, the U.S. proposed counterfactual of assigning Group 4 companies a “separate duty rate” would not be inconsistent with the findings adopted by the DSB.⁹

- ii. Please explain what on the USDOC's record from the underlying investigations and administrative reviews would support the United States' view that the appropriate counterfactual for the exporters or producers within the PRC-wide entity is the all-others rate, and not an individual rate.**

Response:

10. As explained above in the U.S. response to the first subpart of this question, as provided in Article 6.10 of the Antidumping Agreement, the USDOC limited its examination of individual respondents in 22 of the 24 of the proceedings at issue.¹⁰ The U.S. proposed counterfactual

⁸ See U.S. Written Submission, pp. 10-11.

⁹ See Antidumping Agreement, Articles 6.10 and 9.2.

¹⁰ See *Cold-Rolled Steel Flat Products from China*, Preliminary Determination, pp. 2-3 (Exhibit USA-51 at Letter U) (explaining that the USDOC did not receive quantity and value questionnaires from any potential respondents and, thus, did not conduct respondent selection); *Large Residential Washers from China*, Preliminary Determination,

accounts for these factual scenarios (*i.e.*, scenarios in which the USDOC calculates individual rates for a subset of the universe of exporters and/or producers), which are described in the USDOC's preliminary and final determinations.¹¹

11. As further explained above, in two proceedings – *Cold-Rolled Steel Flat Products* and *Large Residential Washers* – the USDOC did not limit its examination of individual respondents. In *Cold-Rolled Steel Flat Products*, no party submitted quantity and value questionnaire responses to the USDOC. Thus, the USDOC did not address the issue of whether to limit individual examination where no party cooperated in the proceeding.¹² However, based on the facts in *Cold-Rolled Steel Flat Products*, a rate based on facts available could have applied even if the producers and/or exporters were not part of the China-government entity. In *Large Residential Washers*, the evidence of record indicated that only two exporters and/or producers existed. Therefore, the USDOC individually examined all known exporters and/or producers and the use of a rate derived from the two known, and individually examined, exporters and/or producers is appropriate.¹³

- iii. Did the USDOC calculate individual rates for each of the exporters or producers that were denied separate rate status, and thus included in the PRC-wide entity? If so, please introduce into evidence the relevant parts of the USDOC's record that shows that such rates were calculated by the USDOC in each of the 25 cases at issue.**

Response:

12. No. The USDOC did not calculate individual rates for each of the exporters or producers that were denied separate rate status and therefore included in the China-government entity. The China-government entity was assigned a rate based on facts available due to the non-cooperation of one or more producers or exporters within the China-government entity.

13. Additionally, as explained above in the U.S. response to the first subpart of this question, as provided in Article 6.10 of the Antidumping Agreement, the USDOC limited its examination of individual respondents in 22 of the 24 of the proceedings at issue.¹⁴ In those cases, due to the large number of exporters and producers, the USDOC would not, in any event, have determined individual antidumping duty rates for each of the exporters or producers that were denied

pp. 1-2 (Exhibit USA-51 at Letter Y) (explaining that the USDOC was investigating all known exporters and/or producers, of which there were two).

¹¹ See Exhibit USA-50, Exhibit-51.

¹² See *Cold-Rolled Steel Flat Products from China*, Preliminary Determination, pp. 2-3, (Exhibit USA-51).

¹³ *Large Residential Washers from China*, Preliminary Determination, pp. 1-2 (Exhibit USA-51).

¹⁴ See *Cold-Rolled Steel Flat Products from China*, Preliminary Determination, pp. 2-3 (Exhibit USA-51 at Letter U) (explaining that the USDOC did not receive quantity and value questionnaires from any potential respondents and, thus, did not conduct respondent selection); *Large Residential Washers from China*, Preliminary Determination, pp. 1-2 (Exhibit USA-51 at Letter Y) (explaining that the USDOC was investigating all known exporters and/or producers, of which there were two).

separate rate status and therefore included in the China-government entity. The U.S. responses to the first two subparts of this question also discuss the situations in *Cold-Rolled Steel Flat Products* and *Large Residential Washers*. The United States refers the Arbitrator to those earlier U.S. responses.

- iv. **In the 25 cases at issue, did the USDOC select exporters or producers for individual examination before or after the determination of whether exporters or producers had passed the single rate test?**

Response:

14. The USDOC selected exporters and/or producers for individual examination before determining whether exporters or producers were eligible for separate-rate treatment.¹⁵

4. **To the United States: In its written submission, the United States describes Group 3 as follows:**

Group 3: Chinese imports from firms that are subject to the China-government entity antidumping duty rate for which there is evidence that they failed to cooperate with the USDOC's investigation, such that a rate based on adverse facts available could have applied even if they were not part of the China-government entity[.]

Article 6.8 of the Anti-Dumping Agreement states that in "cases in which any interested party refuses access to, or otherwise does not provide, necessary information within a reasonable period or significantly impedes the investigation, preliminary and final determinations, affirmative or negative, may be made on the basis of the facts available."

Please clarify, by referring to the relevant parts of the USDOC's record, whether the USDOC made a determination that each of the exporters or producers in Group 3 would get "a rate based on adverse facts available" because "they failed to cooperate with the USDOC's investigation" in each of the cases at issue, as mentioned in the above description of Group 3.

Response:

15. As an initial matter, the USDOC does not, in its investigations or administrative reviews, distinguish between the companies that the United States has, for purposes of this arbitration, described as Groups 3 and 4. Additionally, as the USDOC explained in the relevant decisions, where one or more members of the China-government entity failed to cooperate, the USDOC found that the China-government entity, as an entity, failed to cooperate.

¹⁵ See USA-50 and USA-51 (demonstrating that respondents are selected prior to preliminary and final determinations of issues).

16. Where the USDOC determined that the application of facts available to the China-government entity was appropriate, in some instances, the USDOC did identify by name certain companies in the China-government entity that did not cooperate. In other instances, the USDOC's analysis was more general, focusing on the type of non-cooperative behavior, explaining, *e.g.*, that some known exporters/producers in the China-government entity did not respond to a request for quantity and value information and, therefore, the China-government entity did not cooperate.

17. In circumstances where the USDOC made a determination that failure to submit the requested quantity and value information constituted non-cooperation, even if the USDOC did not identify in its published Federal Register notices the names of each such exporter or producer that failed to submit the requested information, the USDOC determined that the exporters or producers that failed to submit the requested information failed to cooperate.

17. As one example of the USDOC's analysis, in *Certain Coated Paper for High-Quality Graphics Using Sheet-Fed Presses*, the USDOC expressly identified two exporters and/or producers, which were part of the China-government entity, that failed to cooperate. The USDOC explained that, of the companies participating in the investigation, at least two companies withdrew from participating in the investigation, significantly impeding the USDOC's investigation of the companies.¹⁶ By failing to participate in verification, Sun Paper Companies prevented the USDOC from verifying reported information, including separate rates information, and, thus, the USDOC considered Sun Paper Companies part of the China-government entity.¹⁷ Accordingly, the USDOC identified parts of the China-government entity that failed to cooperate. Additionally, the USDOC incorporated its preliminary determination to assign a rate to the China-government entity based on facts available due to numerous other entities that comprise the China-government entity failing to cooperate in this investigation as another basis for applying facts available in the final determination.¹⁸

18. Similarly, the USDOC determined that 38 companies, including mandatory and separate rate respondents, were eligible for a separate rate in the *OCTG* investigation.¹⁹ However, the USDOC determined that certain exporters and/or producers that were part of the China-government entity did not cooperate and failed to provide necessary information. Accordingly, the USDOC determined, because parts of its whole did not provide necessary information, that the China-government entity did not cooperate and failed to provide necessary information, and the USDOC applied adverse facts available to determine the China-government entity rate. The USDOC explained that "the [China-government] entity did not respond to our requests for information because record evidence indicates there were more exporters of OCTG from the PRC during the [period of investigation] than those that responded to the Quantity and Value

¹⁶ See *Certain Coated Paper for High-Quality Graphics Using Sheet-Fed Presses from China* (Final Determination) 75 Fed. Reg. 59,217, 59,220 (Exhibit USA-50).

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ See *Oil Country Tubular Goods from China* (Final Determination), 75 Fed. Reg. 20,335, 20,338 (Exhibit USA-50).

questionnaires or the full antidumping questionnaire.”²⁰ The USDOC further explained that one of the mandatory respondents significantly impeded the investigation, withheld information necessary for the USDOC’s calculations, and failed to cooperate to the best of its ability, so the USDOC applied total facts available, determining that the respondent was not eligible for a separate rate.²¹

19. The USDOC conducted similar analyses in the antidumping duty investigations of CSPV cells, whether or not assembled into modules (solar cells);²² diamond sawblades and parts thereof;²³ multi-layered wood flooring;²⁴ narrow woven ribbon with woven selvedge;²⁵ polyethylene retail carrier bags;²⁶ polyethylene terephthalate film, sheet, and strip;²⁷ and wooden bedroom furniture.²⁸

20. The USDOC made similar determinations in the proceedings challenged “as such.”²⁹ For example, in the investigation of copper pipe, the USDOC concluded that “certain [China-

²⁰ *Id.* at 20,339.

²¹ *Id.*

²² See Memorandum to Paul Piquado from Christian Marsh, Subject: Issues and Decision Memorandum for the Final Determination in the Antidumping Duty Investigation of Crystalline Silicon Photovoltaic Cells, Whether or Not Assembled into Modules, from the People’s Republic of China (October 9, 2019) (Exhibit USA-49).

²³ See Letter G in Exhibit USA-50.

²⁴ See Letter I in Exhibit USA-50.

²⁵ See Letter J in Exhibit USA-50.

²⁶ See Letter K in Exhibit USA-50.

²⁷ See Letter L in Exhibit USA-50.

²⁸ See Letter M in Exhibit USA-50.

²⁹ See e.g., *Notice of Final Determination of Sales at Less Than Fair Value: Non-Malleable Cast Iron Pipe Fittings from the People’s Republic of China*, 68 Fed. Reg. 7,765 (Dep’t of Commerce Feb. 18, 2003); *Notice of Final Determination of Sales at Less Than Fair Value and Affirmative Final Determination of Critical Circumstances: Circular Welded Carbon Quality Steel Pipe from the People’s Republic of China*, 73 Fed. Reg. 31,970 (Dep’t of Commerce June 5, 2008); *Certain Circular Welded Carbon Quality Steel Line Pipe from the People’s Republic of China: Final Determination of Sales at Less Than Fair Value*, 74 Fed. Reg. 14,514 (Dep’t of Commerce Mar. 31, 2009); *Antidumping Duty Investigation of Stainless Steel Sheet and Strip From the People’s Republic of China: Final Determination of Sales at Less Than Fair Value and Final Affirmative Determination of Critical Circumstances*, 82 Fed. Reg. 9,716 (Dep’t of Commerce Feb. 8, 2017); *Seamless Refined Copper Pipe and Tube From the People’s Republic of China: Final Determination of Sales at Less Than Fair Value*, 75 Fed. Reg. 60,725, (Dep’t of Commerce Oct. 1, 2010); *Certain Steel Nails from the People’s Republic of China: Final Determination of Sales at Less Than Fair Value and Partial Affirmative Determination of Critical Circumstances*, 73 Fed. Reg. 33,977 (Dep’t of Commerce June 16, 2008); *Notice of Final Determination of Sales at Less Than Fair Value: Certain Cold-Rolled Carbon Steel Flat Products From the People’s Republic of China*, 67 Fed. Reg. 62,107 (Dep’t of Commerce Oct. 3, 2002); *Antidumping Duty Investigation of Certain Passenger Vehicle and Light Truck Tires From the People’s Republic of China: Final Determination of Sales at Less Than Fair Value and Final Affirmative Determination of Critical Circumstances, In Part*, 80 Fed. Reg. 34,893 (Dep’t of Commerce June 18, 2015); *Certain Seamless Carbon and Alloy Steel Standard, Line, and Pressure Pipe from the People’s Republic of China: Final Determination of Sales at Less Than Fair Value and Critical Circumstances, in Part*, 75 Fed. Reg. 57,449 (Dep’t of Commerce Sept. 21, 2010); *Large Residential Washers From the People’s Republic of China: Final Determination*

government entity] exporters/producers did not respond to the Department’s requests for information.”³⁰ As a result, “the Department treated these [China-government entity] exporters/producers as part of the [China-government] entity” and “since the [China-government] entity did not provide the Department with requested information, pursuant to section 776(a)(2)(A) of the Act, the Department continues to find it appropriate to base the [China-government entity] rate on” facts available.³¹

5. China notes that the United States' formula-based approach is premised upon the use of the PRC-wide entity's historic share in total imports of the subject product from China. However, China submits that this historic share is too low because it does not take into account the fact that the USDOC subsequently included many Chinese exporters or producers in the PRC-wide entity.

- a. To the United States: Please explain how the United States' calculations under the formula-based approach would account for the fact that the exporters or producers within the PRC-wide entity (and as a result the share held by the PRC-wide entity) are not constant but may change (and did change) in proceedings, such as administrative reviews, subsequent to the USDOC's determinations in the original investigations for the 25 products at issue.**

Response:

20. Although the formula-based approach does not take into account the changes in the coverage of the China-government entity, the historic share presented by the United States, as explained in the following paragraphs, is an appropriate reference point, and is not too low, as China argues.

21. China’s assertion that “the U.S. assumption is wrong” is one-sided.³² Although China provides the Arbitrator with numbers of companies which were assigned separate-rate status in the underlying investigation and later found to be ineligible for a separate rate in a subsequent administrative review, China omits from its analysis data that would demonstrate instances where companies subject to the China-government entity following the investigation were later found to be eligible for a separate rate in a subsequent segment of the proceeding and, therefore, no longer part of the China-government entity.³³

of Sales at Less Than Fair Value and Final Negative Determination of Critical Circumstances, 81 Fed. Reg. 90,776 (Dep’t of Commerce Dec. 15, 2016) (Exhibit USA-50).

³⁰ *Seamless Refined Copper Pipe and Tube From the People's Republic of China: Final Determination of Sales at Less Than Fair Value*, 75 Fed. Reg. 60,725, 60,729 (Dep’t of Commerce Oct. 1, 2010) (Exhibit USA-50).

³¹ *Id.*

³² China’s Written Submission, para. 148.

³³ See, e.g., *Multi-layered Wood Flooring*, 82 Fed. Reg. 25,766 (June 5, 2017) (Final Results) (demonstrating that some of the companies highlighted by China as losing separate rates after the final determination in the investigation did have separate rates in 2017) (Exhibit USA-65).

22. Furthermore, China fails to mention that certain companies it highlights as losing their separate rate status following the investigation subsequently regained separate rate status and had such status during all or part of 2017, which is the period that China and the United States agree is the appropriate baseline for estimating the level of nullification or impairment.³⁴ For example, in Solar Cells, China identifies, *inter alia*, Jiawei Solar China Co., Ltd; Eoply New Energy Technology Co., Ltd.; ERA Solar Co.; Ltd; Tianwei New Energy (Chengdu) PV Module Co., Ltd; Ningbo ETDZ Holdings, Ltd; and Ningbo Qixin Solar Electrical Appliance Co., Ltd as firms for whom the USDOC revoked separate rate status after the investigation.³⁵ However, each of these firms had a separate rate at some point during 2017.³⁶

23. Moreover, it is unclear how China arrived at the numbers it reports in paragraph 153 of its written submission. China purports to highlight the names of companies that were found to be eligible for a separate rate and subsequently ineligible for a separate rate. However, the United States is not able to replicate the numbers China has reported.

- b. To both parties: Does the fact that the exporters or producers within the PRC-wide entity have changed following the USDOC's original investigations for the 25 products at issue have a bearing on the United States' calculations under the Armington-based model?**

Response:

24. The fact that the exporters or producers within the PRC-wide entity may have changed following the USDOC's original investigations has no bearing on the calculations under the Armington-based approach because the China-government entity's historic share of total imports is not an input in the model. In fact, the Armington-based model estimates the level of nullification or impairment of the maintenance of the WTO-inconsistent aspects of the measure following the expiration of the RPT as the difference between the value of trade without the WTO-inconsistent measure in 2017 (counterfactual) and the actual value of trade in 2017.

- 6. In referring to the USDOC's determination in Coated Paper, China notes that "the United States' written submission makes clear that, had the United States implemented the DSB rulings for Coated Paper, the United States would have simply reduced the existing AD rate to zero for APP China, those Chinese exporters identified as separate rate respondents and those Chinese exporters included in PRC-wide entity." China argues, however, that "U.S. implementation would not be WTO consistent because reduction in AD duty is not the same as termination of the AD order" and that "the only permissible implementation under the WTO Anti-Dumping Agreement is termination of the AD order." China also argues that "[c]ommon sense dictates that an exporter would have exported higher volumes had**

³⁴ See U.S. Written Submission, para. 26.

³⁵ See Exhibit CHN-27 at p. 4-5.

³⁶ See 82 Fed. Reg. 29,035 (June 27, 2017) (Exhibit CHN-27 at pp. 15-17); see also 82 Fed. Reg. 40,561 (Aug. 25, 2017) (amended final determination) (Exhibit USA-73).

it not faced a 7.62% import duty, and the possibility of even higher duties in future administrative reviews."

a. To the United States: Please respond to China's arguments.

Response:

25. As explained in the U.S. written submission, “[the] proper counterfactual to be applied for the purpose of this proceeding is the removal of the WTO-inconsistent U.S. antidumping duty measures, not the revocation or complete removal of the antidumping duty orders themselves.”³⁷ China is incorrect when it argues that, for purposes of calculating the level of nullification and impairment in this arbitration, termination of the coated paper antidumping order is required and reducing the antidumping duty rate to zero is inadequate. The U.S. Armington-based model takes into account the trade effect of a reduction of the rates to zero and therefore fully accounts for the nullification or impairment of benefits related to the findings adopted by the DSB.³⁸

26. Indeed, applying a rate of zero to all producers or exporters that were subject to the China-government entity rate could overstate the level of nullification and impairment. Specifically, applying a rate of zero to all producers or exporters that were subject to the China-government entity rate would assign that rate to producers or exporters who did not respond to the USDOC’s request for information and, therefore, otherwise might have received a rate higher than zero based on the application of facts available. In fact, in the investigation of coated paper, USDOC sent 56 quantity and value (Q&V) questionnaires to Chinese exporters and producers of the subject merchandise, and received only five responses.³⁹ Had the circumstances of the USDOC’s investigation differed, the USDOC may have relied on facts available to determine a rate for the companies that did not respond.

27. China’s additional arguments concerning the level of nullification or impairment related to the antidumping measure on coated paper are purely speculative. For example, China has not demonstrated that exporters would have exported higher volumes had the antidumping duty order not been in place. The cash deposit rates currently in effect for the antidumping duty order on coated paper are 7.62 percent for Shandong Cheming Paper Holdings Ltd., and 3.64 percent for APP China.⁴⁰ China points to no evidence to support its contention that these rates have depressed export volumes.

³⁷ U.S. Written Submission, para. 6.

³⁸ U.S. Written Submission, para. 105.

³⁹ See *Certain Coated Paper Suitable for High-Quality Print Graphics Using Sheet-Fed Presses From the People’s Republic of China: Notice of Preliminary Determination of Sales at Less Than Fair Value and Postponement of Final Determination*, 75 Fed. Reg. 24,893, 24,900 (Dep’t of Commerce May 6, 2010) (Exhibit USA-51).

⁴⁰ See *Certain Coated Paper Suitable for High-Quality Print Graphics Using Sheet-Fed Presses From the People’s Republic of China: Notice of Court Decision Not in Harmony With Final Determination of Sales at Less Than Fair Value and Notice of Amended Final Determination of Sales at Less Than Fair Value Pursuant to Court Decision*, 80 Fed. Reg. 77,603, 77,604 (Dep’t of Commerce Dec. 15, 2015) (Exhibit USA-74); *Certain Coated Paper Suitable for High-Quality Print Graphics Using Sheet-Fed Presses From the People’s Republic of China: Amended Final*

28. Furthermore, China points to no evidence to support its contention that there is a “possibility of even higher duties in future administrative reviews,” or that such a possibility would depress export volumes. It is difficult to imagine how China might even propose to quantify the nullification or impairment of a “possibility”, and, of course, arbitrators in past proceedings have uniformly based their determinations on hard evidence and have refused to “accept claims that are ‘too remote’, ‘too speculative’, or ‘not meaningfully quantified.’”⁴¹

29. Finally, if these companies believe that the cash deposit rates in effect do not reflect their pricing behavior, the appropriate course of action for these companies would be to request an administrative review of the antidumping duty order. U.S. law provides exporters and producers with an opportunity to request an administrative review of an order each year in the anniversary month of the order. Neither Shandong Cheming nor APP China, however, have ever requested an administrative review of this order.

7. To the United States: The United States argues that the individual rate calculated using the WA-T methodology (with zeroing) for BTIC in *Steel Cylinders* has been withdrawn and that the individual rate for the DuPont Group was not calculated using zeroing in the fourth administrative review in *PET Film*. Please clarify, by referring to relevant record evidence, whether the all-others rates in *Steel Cylinders* and *PET Film* were and continue to be based, entirely or in part, on the individual rates calculated using the WA-T methodology (with zeroing) for BTIC and the DuPont Group.

Response:

30. In the investigation of PET Film, the USDOC selected Dupont Teijin Films China Ltd. (“Dupont”) as a mandatory respondent and assigned it an individual rate of 3.49 percent.⁴² Because Dupont was the sole participating mandatory respondent, the USDOC also assigned Dupont’s 3.49 percent rate to the separate rate respondents.

31. Dupont, however, did not receive an individual rate in the fourth administrative review. Instead, the USDOC selected Tianjin Wanhua Co. Ltd. (“Wahua”) and Shaoxing Xiangyu Green Packing Co., Ltd. (“Green Packing”) as mandatory respondents. Dupont was one of three companies that demonstrated eligibility for a separate rate, but was not selected for individual examination.⁴³ These three companies were assigned a separate rate of 31.24 percent, which was

Determination of Sales at Less Than Fair Value and Antidumping Order, 75 Fed. Reg. 70,203, 70,204 (Nov. 17, 2010) (Exhibit USA-2 at pp. 6-7).

⁴¹ *US – 1916 Act (EC) (Article 22.6 – US)*, para. 6.10; see also *id.*, paras. 5.54 (“In determining the level of nullification or impairment ... we need to rely, as much as possible, on credible, factual, and verifiable information. We cannot base any such estimates on speculation.”) and 5.69 (“We are of the view that any claim for a deterrent or ‘chilling effect’ by the European Communities in the present case would be too speculative, and too remote.”).

⁴² See *Polyethylene Terephthalate Film, Sheet, and Strip from the People’s Republic of China: Final Determination of Sales at Less Than Fair Value*, 73 Fed. Reg. 55,039, 55,041 (Dep’t of Commerce Sept. 24, 2008) (Exhibit USA-50 at Letter K).

⁴³ *Id.*

based on the individual rates assigned to Wanhua and Green Packing, neither of which were calculated using the alternative, average-to-transaction comparison methodology.⁴⁴ Dupont's rate, therefore, was not calculated using zeroing.

32. Furthermore, the “separate duty rate” assigned to the separate-rate respondents in the investigation has been superseded by subsequent rates in administrative reviews because all of the companies assigned a separate rate in the investigation have since been assigned new rates. The “separate duty rate” from the investigation therefore, no longer applies to those separate-rate respondents. The most-recently determined “separate duty rate” assigned in *PET Film* is the 31.24 percent rate.⁴⁵

33. In the investigation of steel cylinders, the USDOC calculated an individual rate for one mandatory respondent, BTIC, which was 6.62 percent.⁴⁶ This rate was calculated using the alternative, average-to-transaction comparison methodology and was the subject of adverse findings adopted by the DSB in this dispute. BTIC was the only mandatory respondent assigned an individual rate, so the USDOC also assigned that rate to the three separate rate respondents.⁴⁷ After the publication of the order, the USDOC amended the individual rate calculated using the alternative, weighted-average to transaction comparison methodology for BTIC in *Steel Cylinders* pursuant to subsequent domestic litigation.⁴⁸ The separate rate assigned to the three separate rate companies in the investigation continues to apply; those three companies did not challenge that rate in domestic court – as BTIC did. Therefore, their rate remains in place.

34. As noted in the U.S. Written Submission, however, China has only challenged the USDOC's use of the alternative, average-to-transaction comparison methodology and “zeroing” with respect to the margin of dumping determined for BTIC.⁴⁹ There is, therefore, no nullification or impairment to China with respect to the continued application of the 6.62 percent rate applied to the separate rate respondents.⁵⁰ It is therefore appropriate to use the 6.62 percent separate rate to calculate the level of nullification or impairment.

⁴⁴ *Id.* See also *Polyethylene Terephthalate Film, Sheet, and Strip From the People's Republic of China: Preliminary Results of Antidumping Duty Administrative Review; 2011-2012*, 78 Fed. Reg. 78,333, (Dep't of Commerce Dec. 26, 2013), and accompanying Preliminary Decision Memo at 17 (Exhibit USA-10).

⁴⁵ See *Memorandum to Paul Piquado from Christian Marsh re: Polyethylene Terephthalate Film, Sheet, and Strip from the People's Republic of China, Issues and Decision Memorandum for the Final Results of the 2011-2012 Administrative Review* (June 24, 2014) (Exhibit USA-11).

⁴⁶ See *High Pressure Steel Cylinders From the People's Republic of China: Final Determination of Sales at Less Than Fair Value*, 77 Fed. Reg. 26,739, 26,742 (Dep't of Commerce May 7, 2012) (Exhibit USA-50).

⁴⁷ *Id.*

⁴⁸ See *High Pressure Steel Cylinders From the People's Republic of China: Notice of Court Decision Not in Harmony With Final Determination in Less Than Fair Value Investigation, Notice of Amended Final Determination Pursuant to Court Decision, Notice of Revocation of Antidumping Duty Order in Part, and Discontinuation of Fifth Antidumping Duty Administrative Review*, 82 FR 46,758, 46,759 (Dep't of Commerce Oct. 6, 2017) (Exhibit USA-7).

⁴⁹ U.S. Written Submission, para 102.

⁵⁰ U.S. Written Submission, para 102.

11. To the United States: The Arbitrator understands that the United States is proposing to set the level of nullification or impairment to zero for the USDOC's WTO-inconsistent use of the WA-T methodology (with zeroing) in calculating the individual rate for TPCO in OCTG because (1) there is not a sufficient level of imports from the exporters or producers in the PRC-wide entity to apply the Armington-based model and (2) the impact on trade levels would be "minimal".

a. Is this understanding correct and if so, please explain the legal basis for setting the level of nullification or impairment to zero in Article 22.6 proceedings where the impact on trade levels is "minimal"?

Response:

35. The Arbitrator's understanding is correct. As the United States explained in its submission, given that the tariff modification that would apply in the counterfactual scenario is less than two percent, the impact would be so small that it cannot be "meaningfully quantified."⁵¹ An estimation of zero as the level of nullification or impairment is thus reasonable and plausible in this situation. Article 3.8 of the DSU provides that a Member concerned is able to rebut a charge that there has been any nullification or impairment.

36. Additionally, the fact that the United States has the burden of substantiating its objection to the level of suspension of concessions requested by China means that the United States must show that China's requested level of suspension is not equivalent to the level of nullification or impairment. Regarding the use of the alternative, average-to-transaction comparison methodology and "zeroing" in *OCTG*, the United States has met its burden and has demonstrated that China's requested level of suspension is not equivalent to the level of nullification or impairment.⁵²

b. Why would it not be possible to use the WA-WA rate on record for TPCO or a rate of 0.00% as the counterfactual, combined with the use of either the Armington-based model, the formula-based approach, or another model?

Response:

37. As explained in the U.S. written submission, the United States is not able to provide a reasonable estimation of the level of nullification or impairment for TPCO using the Armington-based approach because there is not a sufficient level of subject imports from China in 2017. In addition, the United States cannot use a formula-based approach that would apply solely to TPCO (neither with the WA-WA rate on record nor a rate of 0.00 percent) because the United States does not have data on TPCO's market share prior to the imposition of the antidumping duty order.

⁵¹ *US – 1916 Act (EC) (Article 22.6 – US)*, para. 6.10.

⁵² See Exhibit CHN-21, China's Revised Estimates of N/I.

3 ECONOMIC MODEL

3.1 China's Proposed Economic Model

3.1.1 Data issues

13. **To both parties: Please explain why there are discrepancies in the trade value data submitted by China for US imports from China in 2017 and US imports from all countries in 2017 and the trade value data submitted by the United States (see Table 1 and Table 2 in Appendix 2).**

Response:

38. The trade value data provided by the United States in Appendix D is the exact value of imports subject to antidumping duties under each antidumping duty order at issue in this dispute. As explained in the U.S. responses to question 29, the trade value data the United States has provided to the Arbitrator is sourced from CBP, the federal agency that is responsible for collecting duties applied at the border, including antidumping duties.

39. In contrast, China has provided to the Arbitrator data that reflects the total value of imports from China under certain Harmonized Tariff Schedule (“HTS”) subheadings (*i.e.*, a product category that is broader than the specific products at issue here), and likely includes products that are not covered by the U.S. antidumping duty orders at issue in this dispute. China's reliance on HTS reference codes also results in some double-counting of nullification or impairment, as the HTS reference codes for *Circular Welded Carbon Quality Steel (A-570-910)* and *Circular Welded Carbon Quality Steel Line Pipe (A-570-935)* overlap.

40. Finally, in *Off-The-Road Tires*, *Wood Flooring*, and *Steel Nails*, China did not apply the correct scope for 2017 when querying and compiling trade data. In these three antidumping duty orders, China included numerous HTS codes that were not part of the three antidumping duty orders at the beginning of 2017, which is the baseline for the counterfactual. For instance, in *Wood Flooring* and *Off-The-Road Tires*, China relies on USDOC Federal Register notices that were published in June 2017, which added a significant number of HTS codes to the scopes of the two antidumping duty orders.⁵³ By including these additional HTS codes in its data query, China has inappropriately broadened the category of applicable trade data for 2017.

14. **To the United States: China discovered "inadvertent mistakes" in compiling the underlying data and confirms it has resolved all data discrepancies in its written submission. Does the United States agree that China's revised data match the HS codes included in the public notice of the USDOC's final determinations? If not, could the United States please point out which specific discrepancies still remain regarding the data inputs?**

Response:

⁵³ See Exhibit CHN-22, Attachment B.

41. Except for the data errors regarding *Off-The-Road Tires, Wood Flooring, and Steel Nails*, China’s revised HTS data in Exhibit CHN-22 match the HTS data that the United States has submitted.

3.12. Choice of Methodology

17. Please respond to the following concerning the choice of the tabular DID approach over the regression DID approach:

- a. **To China: The United States argues that the benefit of a regression DID approach is that "it can be expanded to include variables that control for time-varying characteristics of comparison groups" and that "it allows the analyst to capture variation in 'treatment intensity,' which is the variation in the magnitude of antidumping duty margins." While China admits that, for some applications, the regression DID approach is desirable because "other information can be included into the regression", China argues that the regression DID approach is not appropriate in this dispute. Does China have any theoretical and empirical evidence to support its view that the regression DID approach is not appropriate for this dispute?**

Response:

42. While this question is directed to China, the United States takes this opportunity to further discuss why DID analysis, as China has misapplied it, is wholly inappropriate for estimating the level of nullification or impairment in this proceeding.

China’s Nullification or Impairment Estimates are Biased and Inconsistent

43. China’s estimates of nullification or impairment are distorted by two types of statistical error: bias⁵⁴ and inconsistency.⁵⁵ These are distinct from a statistical point of view. However, both imply that China’s tabular DID estimates do not represent the true level of nullification or impairment attributable to the antidumping duty orders under China’s counterfactual. China provides a correct technical definition of statistical bias in its written submission, but includes no accompanying discussion of likely sources of bias and how the handful of specifications on which China bases its final estimates of the level of nullification or impairment demonstrates that its estimates are sufficiently robust to overcome concerns about bias.

⁵⁴ The United States uses the term “bias” in its technical sense, meaning “[t]he difference between the expected value of an estimator and the population parameter the estimator estimates.” Exhibit CHN-25, p. 5.

⁵⁵ The scientific rationale that allows analysts to draw conclusions based on estimates drawn from a sample of data rests on the assumption that the estimate would get closer to the true value as the size of the sample data gets larger. An estimator that does not converge to the true value as sample size increases is referred to as an “inconsistent” estimator. See Cameron, C.C. and P.K. Trivedi. (2005). Appendix A: Asymptotic Theory In *Microeconometrics: Methods and Applications* (pp.944-945). Cambridge: Cambridge University Press (Exhibit USA-40).

44. The United States executed additional checks on the robustness of China’s estimates of nullification or impairment using additional DID specifications. The analysis focuses on the CSPV cells antidumping duty order for convenience and clarity, but the conclusions apply to China’s analysis more generally. U.S. analysis of the CSPV cells antidumping duty order reveals that China’s estimates of nullification or impairment are so riddled by bias and inconsistency that they are meaningless.

45. China’s response to the U.S. criticism that China’s DID estimates are biased is simply to assert that it is not a concern because China has provided multiple estimates⁵⁶ of nullification or impairment for the Arbitrator to observe the range.⁵⁷ This is far from sufficient. As the U.S. written submission explains,⁵⁸ China’s estimates are all obtained from models that rely on equally questionable underlying assumptions, the violation of which is the source of bias and inconsistency in China’s estimates of nullification or impairment. The number of estimates and the range of their values are entirely irrelevant to the question of bias.

46. Despite China’s assertions that it offers the Arbitrator “great flexibility in defining what other countries are in the control group,”⁵⁹ China only presents results from two very similar, highly-aggregated comparison groups: U.S. imports from the world (“World”) and U.S. imports from non-subject countries (“Non-Subject”). The difference between World and Non-Subject is merely that the latter group excludes imports from China and perhaps a few other countries. Neither comparison group satisfies DID requirements. Table I presents each of China’s DID estimates from the CSPV cells antidumping order, ranging from \$4,273 to \$1,575 million,⁶⁰ along with China’s estimate of nullification or impairment, \$3,233. Each of these estimates are distorted by bias and inconsistency.

Table I: China’s DID Estimates of N/I – CSPV Cells (Case A-570-979)

Case	Requested N/I (\$US millions)	DID Levels		DID Growth				Ratio: $\frac{\text{highest}}{\text{lowest}}$
		<i>Non-Subject</i>	<i>World</i>	<i>Non-Subject</i>	<i>World</i>	<i>HTS 4</i>	<i>HTS2</i>	
CSPV Cells	\$3,233	\$4,273	\$3,106	\$3,698	\$1,852	\$1,726	\$1,575	2.5

The DID Requirements Highlighted by the United States are Fundamental

47. The idea underlying DID analysis is to measure the impact of policy as if it were a randomized controlled trial of the type common to laboratory settings in the physical and

⁵⁶ China’s Written Submission, para 103.

⁵⁷ China’s Written Submission, para 105.

⁵⁸ U.S. Written Submission, section IV.A.2.

⁵⁹ China’s Written Submission, para. 96.

⁶⁰ The broad range of estimates for other cases is noted in the U.S. response to question 22.

biological sciences.⁶¹ In the present context, the idea is to measure the effect of the antidumping duties on U.S. imports of CSPV cells from China (“imports from China”) as the difference between imports from China and a comparison group of U.S. imports not subject to antidumping duties. China’s implementation ignores key requirements of DID analysis, dismissing them as “technical quibbles.”⁶²

48. The three requirements for DID analysis are not abstract, technical rules followed only by strict econometric practitioners. The parallel trends, uniformity, and stability requirements are standards that must be met in order to treat the imposition of antidumping duties on imports from China as if it is a randomized controlled trial. If these requirements cannot be satisfied, DID analysis cannot be used.

The DID Requirements: Roots in Randomized Controlled Trials

49. It is easy to understand the importance of each requirement if one considers them in the context of a common type of medical study. Suppose one is interested in learning whether taking a Vitamin C supplement can reduce the number of days an individual suffers from the common cold. One way to design an experiment to test this would be to randomly assign one group of people to take the supplement and another to take a placebo. The effect of the supplement would be the difference between the number of days the two groups suffered from the common cold. To ensure the study isolated the effect of Vitamin C apart from all other factors, one would follow three key guidelines.

- First, the two groups should be composed of individuals with similar trends in their propensity to get colds over the study period. For example, a 25-year old who moves from Miami (where the temperature is high) to begin teaching Kindergarten (which involves interacting with children who tend to get and spread colds more often) in Minnesota (where the temperature is low) midway through the study is likely to experience an increased propensity to get a cold regardless of Vitamin C intake. The effectiveness of the supplement should not be based on a comparison between that individual and another 25-year old who remains an accountant (in an office of other adults) in Miami throughout the period of analysis. That is, it should be reasonable to assume the treatment and control group follow parallel trends in the absence of the treatment.
- Second, one should be sure that the treated individuals take Vitamin C in the prescribed amount throughout the period and that individuals in the control group are not taking Vitamin C throughout the period. If a group of treated individuals begins to take half the prescribed amount midway through the period of analysis, the effectiveness of Vitamin C

⁶¹ Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How much should we trust differences-in-differences estimates? *The Quarterly journal of economics*, 119(1), 249-275 (Exhibit USA-35).

⁶² China’s written submission, Para. 99.

may be under-estimated. That is, the treatment must be uniform throughout the period of analysis.

- Third, the individuals assigned to the treatment and control groups must remain constant throughout the period of analysis. An important corollary to this requirement is that the effects of Vitamin C should not “spillover” onto individuals in the control group. For example, one might avoid conducting the experiment in a dormitory where the common cold is easily spread. If Vitamin C reduces the propensity to get a cold, it may also reduce the propensity to spread colds. The effectiveness of Vitamin C might be under-estimated if individuals taking the placebo have fewer colds because their treated neighbors were taking Vitamin C. That is, the treated and untreated populations must be stable, and to maintain this stability, the effects of the treatment must not “spillover” onto the control group.

China’s Analysis is Premised on False Assumptions

50. The requirements described above apply equally to DID analysis in the social sciences. To use DID analysis to measure the impact of antidumping duties on imports from China, one must construct the analysis to approximate as closely as possible a randomized controlled trial. Translated into the present context, the design of China’s analysis must meet three demanding and equally important standards.

51. Parallel trends: It must be reasonable to assume that imports from China are sufficiently similar to imports from the comparison group that their value would have followed the same trend throughout the period of analysis in the absence of antidumping duties.

52. Uniformity: Antidumping duties on CSPV cells imported from China must be applied to the subject products consistently throughout the period of analysis. Likewise, antidumping duties must consistently not be applied on imports from the comparison group throughout the period of analysis. When this assumption is violated, the observed group-level trends are not representative of the true effects of antidumping duties or absence thereof.

53. Stability: Antidumping duties must be applied to the same products throughout the period of analysis. The product scope cannot change. Pursuant to this, it must be reasonable to assume that antidumping duties on imports from China have no effect on imports from the comparison group. If antidumping duties on imports from China cause imports from the comparison group to increase, as implied by basic economic theory, comparison group imports are effectively “treated” by antidumping duties. In this case, the trend in comparison group imports does not represent the trend in the absence of antidumping duties on imports from China, and estimates of nullification or impairment are inflated.

54. The central challenge of using DID for policy analysis is defining a comparison group with respect to which these requirements can be satisfied. If such a comparison group does not exist or cannot be identified, DID analysis does not provide unbiased and consistent estimates.

China's Estimates Are Distorted by Omitted Variables Bias

55. Violations of the parallel trends and stability requirements in China's analysis manifest, in part, as omitted variables bias in the value of China's estimates of nullification or impairment. Omitted variables bias arises when a control variable that explains the outcome and is correlated with included explanatory variables is omitted from the analysis.⁶³ The potential for omitted variable bias in DID – including tabular DID – and how to address such bias is discussed in China's primary methodological reference, Angrist and Pischke (2008).⁶⁴

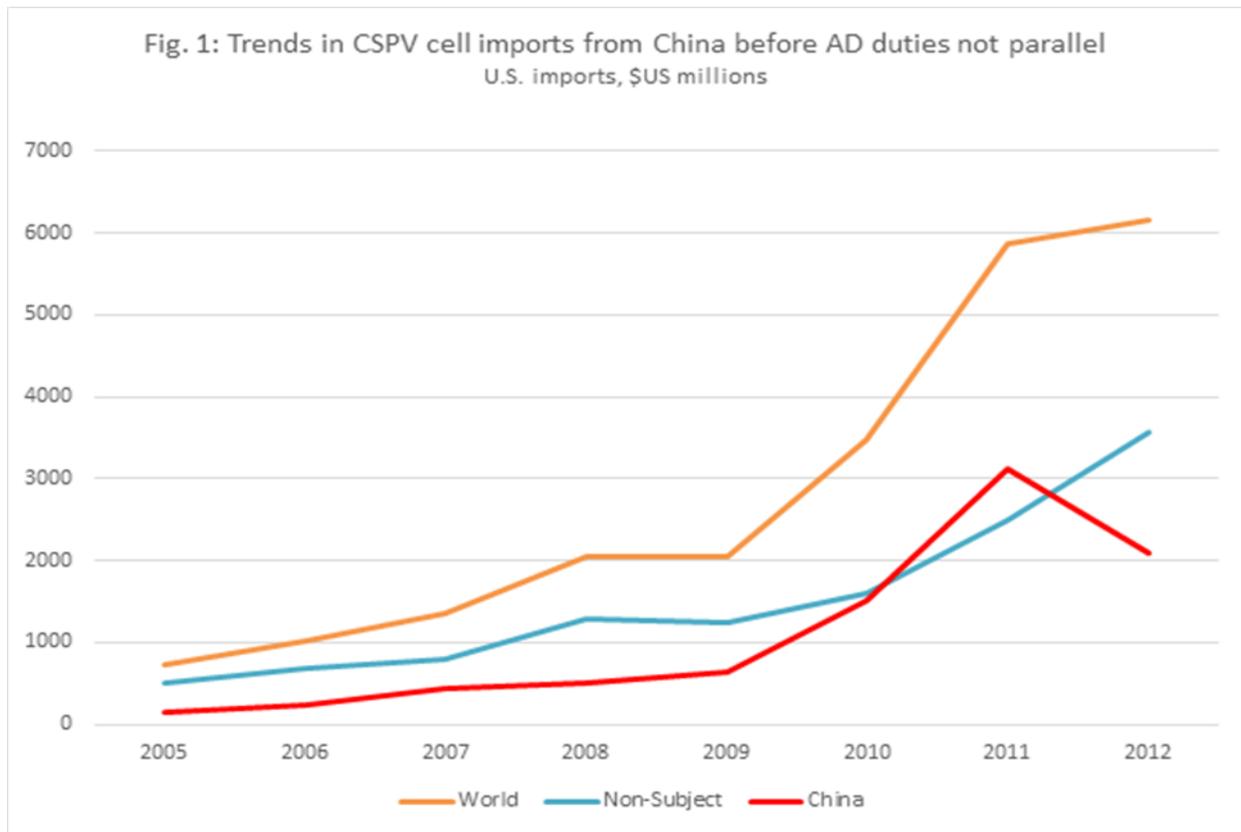
56. If the parallel trends assumption is not reasonable, it implies that factors other than antidumping duties explain some portion of the divergence in trends between each comparison group and China. If these other factors are omitted from the model, the estimates the model produces will be biased.

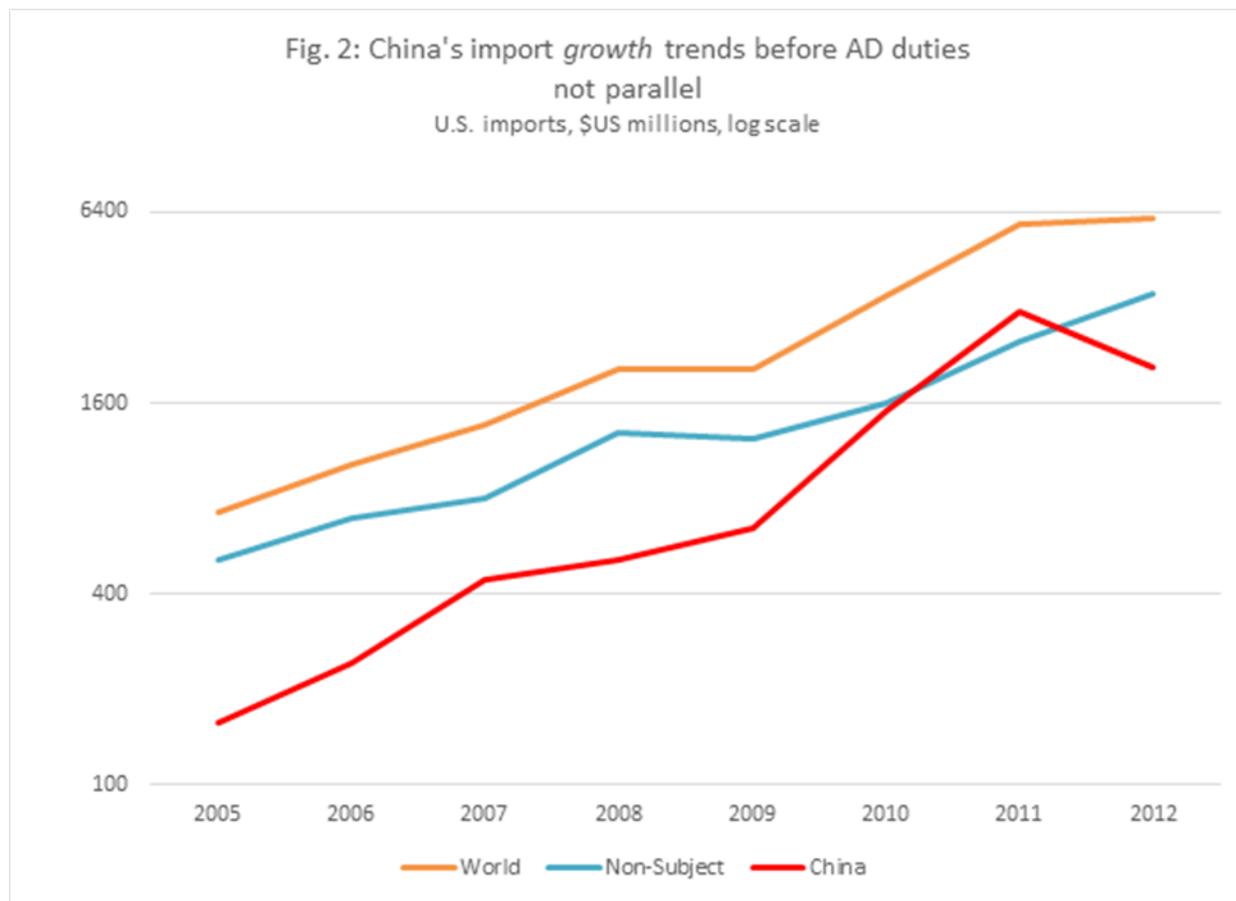
57. Figures 1 and 2 reveal that historical trends in CSPV cells imports are not supportive of the parallel trends assumption for China's selected comparison groups. Figure 1 displays U.S. imports of CSPV cells from China, World, and Non-Subject under the HTS10 subheadings (which were used as reference codes in the USDOC's scope definition) from 2005 through 2012, when the antidumping duties were first applied. One can see, in particular in the period from 2009 to 2012, that the trends are not parallel.

58. Figure 2 displays these imports on a logarithmic scale, which shows the rate of change in imports over time. To establish whether the omitted variable bias has a significant effect on China's estimates of nullification or impairment estimates, we adjust the model specification to account for some of the factors that can reasonably be expected to cause departures from the parallel trends assumption. That is, we conduct selected, proper robustness checks.

⁶³ See Trivedi, pp.92-93 (USA-40).

⁶⁴ Exhibit CHN-18, pp. 236-237.





Correcting for Spillovers Reveals Substantial Bias in the CSPV Cells Case

59. Figure 3 displays U.S. imports of CSPV cells (again, as defined by the HTS10 reference codes used by the USDOC) during the period in which the antidumping duties were imposed (2012-2017). Whereas imports from China began declining midway through the period, Non-Subject imports rose, dramatically so in 2015 and 2016. To the extent the large increase in imports from non-subject countries can be attributed to antidumping duties on imports from China, they represent “spillover” effects of the duties. In the presence of spillovers, the observed trend in imports does not represent the trend that would have been observed in the absence of antidumping duties. Comparison groups that include spillover effects are therefore not valid for DID analysis.

60. Basic economic theory suggests that Non-Subject imports should increase as a result of antidumping duties on imports from China.⁶⁵ In fact, China acknowledges that this is the likely

⁶⁵ See Nicholson, W. (2005). Chapter 6: Demand Relationships Among Goods, in Nicholson, W., *Microeconomic Theory: Basic Principles and Extensions*, 9th.Ed. (Mason, Ohio: South-Western Publishing). Pp. 161-177 (Exhibit USA-39).

outcome when it explains that imports from China likely would have increased as a result of antidumping duties on third countries.⁶⁶



61. In the CSPV cells case, the United States undertook an investigation that led to a safeguard determination, which was published in November 2017.⁶⁷ The scope of the safeguard investigation is identical to the HTS10 reference codes used for the CSPV cells antidumping order, and the period of investigation (2012-2015) overlaps with the period of analysis in China’s methodology paper.

62. The safeguard action itself has no bearing on the estimation of nullification or impairment attributable to the CSPV cells case. However, Section 6 of the USITC’s report in the safeguard investigation provides evidence of spillover effects onto imports from Korea, Malaysia, Thailand, and Vietnam, which are attributable to antidumping duties applied to

⁶⁶ China’s Methodology Paper, para. 45 (noting that “when the United States imposes additional duties on other foreign suppliers (either at the same time as it imposed duties on China or in subsequent cases), one would expect that “but for” the WTO inconsistent anti-dumping orders that China would have experienced an increase in import demand.”)

⁶⁷ See *Crystalline Silicon Photovoltaic Cells*, Investigation No. TA-201-75, U.S. International Trade Commission, Publication 4739, Volume I: Determination and Views of Commissioners, November 2017, available at https://www.usitc.gov/publications/safeguards/pub4739-vol_i.pdf

imports from China.⁶⁸ After antidumping duties were imposed in 2012 (“the 2012 order”), additional antidumping duties that cover a broader range of products were imposed in 2015 (“the 2015 order”). Importantly, while the product scope of the 2015 order was larger, in terms of the narrative definition of the product covered by the 2015 order, the 10-digit HTS codes referenced in the 2015 order are the same. Since China’s data is based on these 10-digit HTS codes, China’s analysis captures spillovers attributable to both the 2012 order and the 2015 order.

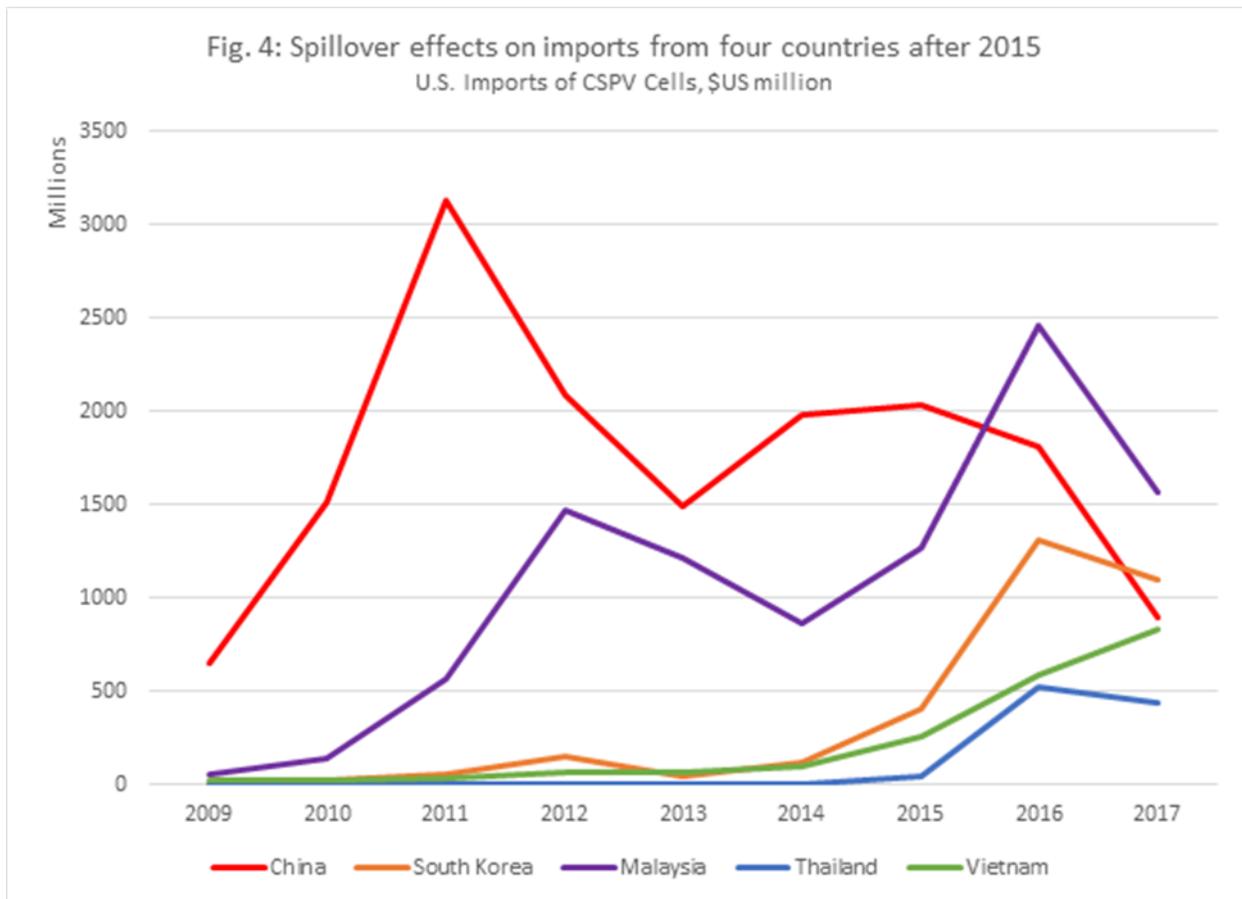
63. Figure 4 illustrates the dramatic increase in U.S. imports from Korea, Malaysia, Thailand, and Vietnam after 2015. The USITC’s report in the safeguard investigation also notes that the six largest Chinese companies expanded production in either CSPV cells or CSPV modules in the Netherlands, Canada, and Indonesia.⁶⁹

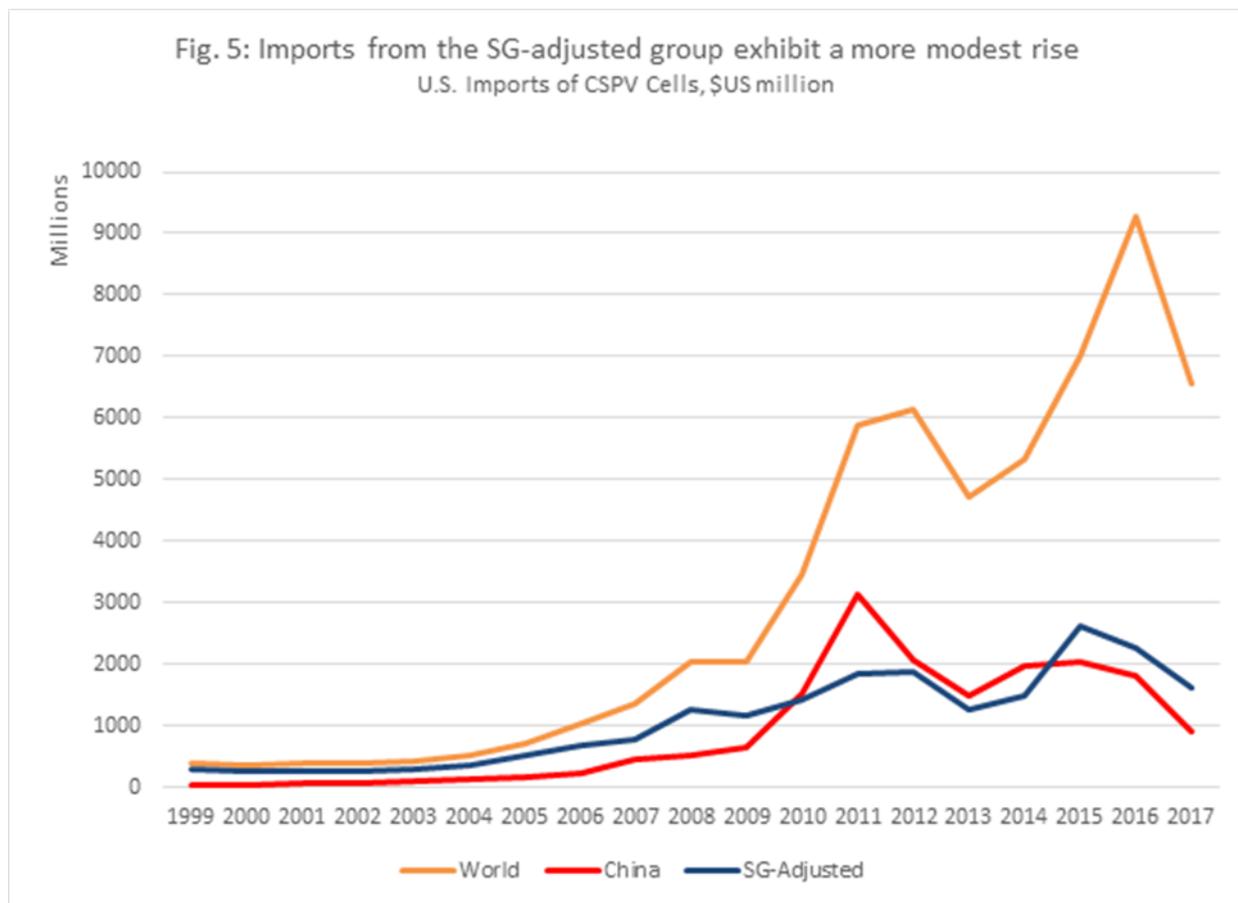
64. Figure 5 illustrates U.S. imports from China, U.S. imports from the world, and imports from a new comparison group, which we will refer to as the SG-adjusted group. The SG-adjusted group consists of U.S. imports from the world less those from China, Taiwan, and the four countries where the evidence of spillovers is strongest: South Korea, Malaysia, Thailand, and Vietnam.

65. Abstracting from the question of whether the historical data support the parallel trends assumption for the SG-adjusted group – as China assumes for all comparison groups in its methodology paper – tabular DID in trade levels implies an estimated level of nullification or impairment of \$999 million. This is roughly one third of China’s estimate of nullification or impairment based on imports from the world (\$3,106), and is just under a quarter of China’s estimate based on non-subject imports (\$4,273). Despite China’s insistence that its results are robust to the choice of comparison group, China’s tabular estimates are not robust to accounting for the spillover gains to imports from South Korea, Malaysia, Thailand, and Vietnam.

⁶⁸ *Id.*, (noting that “after the imposition of the antidumping and countervailing duty orders on imports from China in December 2012 and on imports from China and Taiwan in 2015, imports from other countries substantially increased their presence in the U.S. market. ... Indeed, without closing any of their existing capacity in China, the six largest firms producing CSPV cells and CSPV modules in China increased their global capacity to produce [CSPV cells and CSPV modules] ... Notably, imports from the four countries where Chinese affiliates added both CSPV cell and CSPV module capacity (Korea, Malaysia, Thailand and Vietnam) increased their share of apparent U.S. consumption from *** percent in 2012 to *** percent in 2016, and much of this increase occurred between 2015 and 2016, as their collective share of the U.S. market more than ***... just after the second round of antidumping and countervailing duty orders went into effect in February 2015.”), pp. 40-41.

⁶⁹ *Id.*





Inconsistency Due to Group-Time-Specific Shocks Dramatically Inflates China’s Estimates

66. In general, tabular DID estimates are particularly likely to be distorted by a form of inconsistency that is closely related to omitted variable bias, which is described above. To understand the source of the issue, imagine that one has accurately defined trends in U.S. imports from China and a comparison group. The realized value of imports in any given year is very rarely exactly equal to the trend’s predicted value. Rather, the actual value of imports is the value predicted by the trend plus or minus some deviation, which economists refer to as a “shock”. The deviation in a given year can be separated into a portion that comes from “idiosyncratic shocks” – deviations from trend at the individual firm level – and “systematic shocks” – deviations from trend that affect all firms exporting from China or from a comparison group. Such systematic shocks may arise from natural disasters, currency valuation, domestic or external political conflict, or many other sources.

67. Both idiosyncratic and systematic shocks affect the value of U.S. imports in any given year. The presence of systematic shocks that affect all firms in China or in a comparison group in a given year causes DID estimates to be inconsistent. The only way to address this inconsistency is to perform the analysis with multiple comparison groups and years. In effect, this means that one must use regression-based DID analysis to avoid inconsistency from group-time-specific random shocks.

68. To evaluate whether China's DID estimates were robust to group-time-specific shocks, the United States estimated the level of nullification or impairment using simple regression DID, as it was presented in China's methodology paper:⁷⁰

Equation 1: Basic regression DID

$$outcome_{it} = \beta_0 + \beta_1 Treatment_i + \beta_2 Post_t + \beta_3 (Treatment_i \times Post_t) + \epsilon_{it}$$

69. In Equation 1, $outcome_{it}$ is U.S. imports from country i in year t ; $treatment_i$ is a dummy variable equal to 1 if country i is China; and $Post_t$ is a dummy variable equal to 1 if year t is 2012 or later. As China's methodology paper explains, the DID measure of the nullification or impairment is the value of the coefficient β_3 .⁷¹ The United States estimates equation 1 using the 40 countries from which the United States regularly imported CSPV cells as individual comparison groups. The corresponding estimate of nullification or impairment is \$115.7 million – an order of magnitude smaller than any of China's estimates of nullification or impairment.⁷²

70. Importantly, the parallel trends, uniformity, and stability assumptions are still required to be reasonable when multiple comparison groups are used. Confirming that these requirements are met country-by-country can be an arduous task. Slaughter (2001)⁷³, which China references in its methodology paper, evaluates the robustness of his results without examining each competitor country individually. Instead, Slaughter estimates 10,000 DID models, each with a different randomly drawn set of individual countries as comparison groups.

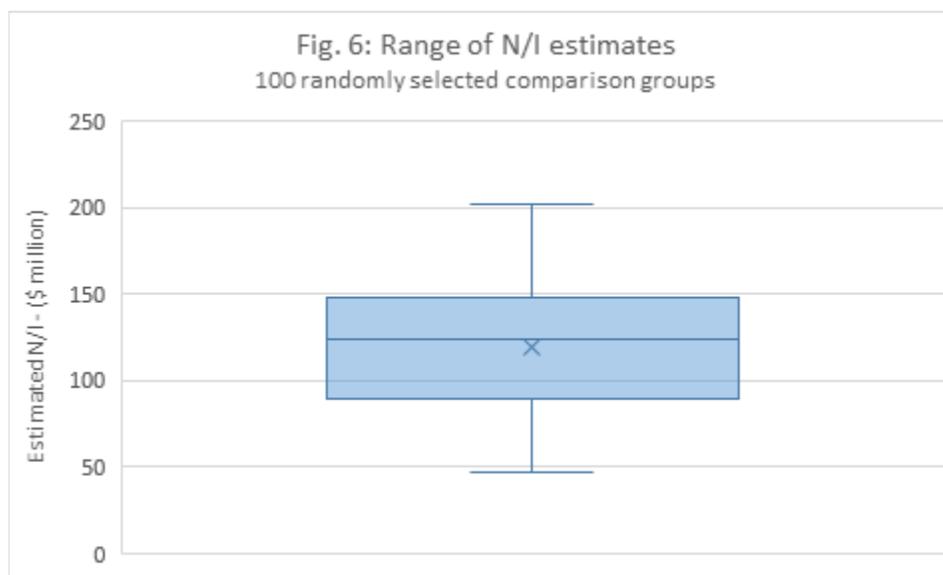
71. To illustrate how straightforward it is to estimate several different model specifications in the regression framework, the United States estimated the model 100 times using a different randomly selected set of countries from the 40 regular importers as comparison groups using a very simple program written in Stata, a standard statistical software program. Figure 6 presents the estimates of nullification or impairment from these 100 models in a whisker plot. The nullification or impairment estimates range from \$46.8 million to \$201.5 million, with a median value of \$123.5 million. None comes close to the magnitude of the estimates based on highly aggregated imports presented by China. These results demonstrate that China's estimates of nullification or impairment are not robust to inconsistency from group-time-specific changes.

⁷⁰ China's Methodology Paper, para. 37.

⁷¹ China's Methodology Paper, para. 38.

⁷² This estimate is statistically significant at the one percent level using standard errors clustered by partner country, as suggested in Ciani, E., & Fisher, P (2019), *Dif-in-Dif Estimators of Multiplicative Treatment Effects*, Journal of Econometric Methods, 8(1) (Exhibit USA-61).

⁷³ Slaughter's paper is not about the effect of trade policy on trade flows. The topic is whether trade causes per-capita incomes to converge across countries.



72. In the CSPV cells antidumping order, the United States has additional evidence that select countries are not appropriate comparison groups due to spillover effects. Table II presents results from estimating Equation 1 excluding these countries. In Table II, SG-Adjusted Group 1 includes all 40 importers except Korea, Malaysia, Thailand, and Vietnam. SG-Adjusted Group 2 also excludes Canada, Indonesia, and the Netherlands. Estimated levels of nullification or impairment in models that account for spillover effects are \$57.6 million and \$56.9 million. These values are on the low end of the estimates of nullification or impairment produced by randomly choosing countries to include as comparison groups, as discussed above.

Table II: Accounting for Spillovers (Beginning Year is 2009)

Comparison Group	Estimated N/I	Clustered Standard Error	Significance Level (p-value) ⁷⁴	#Observations
All 40	115.7	34.54	0.00	368
SG-Adjusted 1	57.6	11.5	0.00	323
SG-Adjusted 2	56.9	12.5	0.00	296

Failure to Account for Additional Duties Imposed in 2015 Generates Overwhelming Bias

73. It is clear from the USITC’s analysis in its safeguard investigation, referenced above, that the additional duties imposed by the 2015 order had an effect on trends in U.S. imports from

⁷⁴ The Significance Level, or p-value, is a measure of the estimate’s precision. An estimate is generally considered to be statistically distinguishable from zero when the p-value is less than 0.05. For a technical definition, see McClave, J. T., Benson, P. G., & Sincich, T. (2001). *Statistics for business and economics*, 8th Ed. Pearson/Prentice Hall, p. 354 (Exhibit USA-60).

China and many other countries. Since China uses trade flows defined at the HS10 level as its dependent variable, China’s analysis does not separate the effect of the 2012 order from that of the 2015 order. The existence of the 2015 order is thus a classic example of an omitted variable that may bias estimates of nullification or impairment attributable to the 2012 order.

74. The previous exercise accounted for the 2015 order in a way by controlling for the spillover effects that the USITC safeguard report attributes primarily to the 2015 order. The United States explores the robustness of China’s estimates to bias from omitting the 2015 order more comprehensively by adapting equation 1 to add a second round of “treatment” in 2015:

Equation 2: Regression DID with two rounds of AD duties

$$outcome_{it} = \beta_0 + \beta_1 Treat12_i + \beta_2 Post12_t + \beta_3 (Treat12_i \times Post12_t) + \beta_4 Treat15_i + \beta_5 Post15_t + \beta_6 (Treat15_i \times Post15_t) + \epsilon_{it}$$

75. In Equation 2, $Treat12_i$ is a dummy variable equal to one if the country is China; $Post12_t$ is a dummy variable equal to one if the year is 2012 or later; $Treat15_i$ is a dummy variable equal to one if the country is China or Taiwan; $Post15_t$ is a dummy variable equal to one if the year is 2015 or later. The estimated level of nullification or impairment attributable to the 2012 order is again captured by β_3 .

76. Table III presents estimates of nullification or impairment obtained from Equation 2 using all 40 regular sources of imports as comparison groups. The estimate of nullification or impairment is not statistically significant at a reasonable level. This means that the nullification or impairment attributable to the 2012 order is \$0.

Table III: Controlling for CSPV cell AD Duties Imposed in 2015

Comparison Group	Estimated N/I	Robust Standard Error	Significance Level (p-value)	#Observations
All 40	-30.6	28.5	28.5	368

China’s Estimates are Distorted by Endogeneity Bias

77. China’s estimates of nullification or impairment in the CSPV cells antidumping order are also distorted by a common flaw in statistical analysis known as “endogeneity bias.”⁷⁵ A key manifestation of endogeneity here is due to the fact that antidumping duty orders were imposed on firms whose exports to the United States were increased by conditions that allowed those firms to sell at less than fair value in the United States. This link between pre-duty import levels and the imposition of antidumping duties through a third factor that is not included in the DID tabular model causes endogeneity bias.

⁷⁵ Linear regression estimates are “inconsistent” when explanatory variables included in the model are correlated with explanatory variables that are not included. See Trivedi, Ch. 4.8.1 (Exhibit USA-40).

78. Endogeneity bias is a very common obstacle encountered in DID analysis of economic policy.⁷⁶ The United States did not make the considerable effort that would be required to measure the magnitude of the bias attributable to this very challenging problem in the CSPV cells antidumping order. Endogeneity bias affects every one of China’s estimates and simply makes DID an untenable choice of statistical model for estimating nullification or impairment.

China’s Final Estimates of Nullification or Impairment Are Fundamentally Biased and Mutually Exclusive: the Two “Metrics” Cannot Both Satisfy Parallel Trends

79. The final estimates of nullification or impairment presented by China for each antidumping order at issue in this proceeding are averages of estimates obtained from tabular DID in the level of import values and estimates obtained from tabular DID in the natural logarithm (“log”) of import values. As noted in Angrist and Pischke,⁷⁷ and detailed in Ciani and Fisher (2019),⁷⁸ a DID model may be applied to a variable in levels or in logs, but the parallel trends standard can only be satisfied in either levels or logs. Estimates from at least one of these metrics must be biased, and thus their average is also biased.

80. In technical terms, DID in levels – whether calculated using linear regression or tabular methods – is based on an underlying model with an additive trend:

$$N/I = DID = imports_{withAD} - imports_{noAD} \quad (3)^{79}$$

where $imports_{withAD}$ refers to expected U.S. imports from China with antidumping duties and $imports_{noAD}$ refers to U.S. imports from China without antidumping duties. Adapting the explanation in Angrist and Pischke’s Equation 3 means that, in the absence of antidumping duties, imports are the sum of a time-invariant country effect and a year effect that is constant across countries.

81. In contrast, the concept underlying China’s estimates of nullification or impairment from DID using the log of imports is an underlying model with a multiplicative trend, which calculates nullification or impairment in percentage terms:

$$N/I \% = \exp\{DID\} - 1 = \frac{imports_{withAD} - imports_{noAD}}{imports_{noAD}} \quad (4)^{80}$$

⁷⁶ See Besley, T., & Case, A. (2000). *Unnatural Experiments? Estimating the Incidence of Endogenous Policies*, *The Economic Journal*, 110(467), 672-694 (Exhibit USA-34); see also, Bertrand (USA-35).

⁷⁷ See Exhibit CHN-18, footnote 7, page 230.

⁷⁸ Exhibit USA-61.

⁷⁹ *Id.*, p.2

⁸⁰ *Id.*, p.3

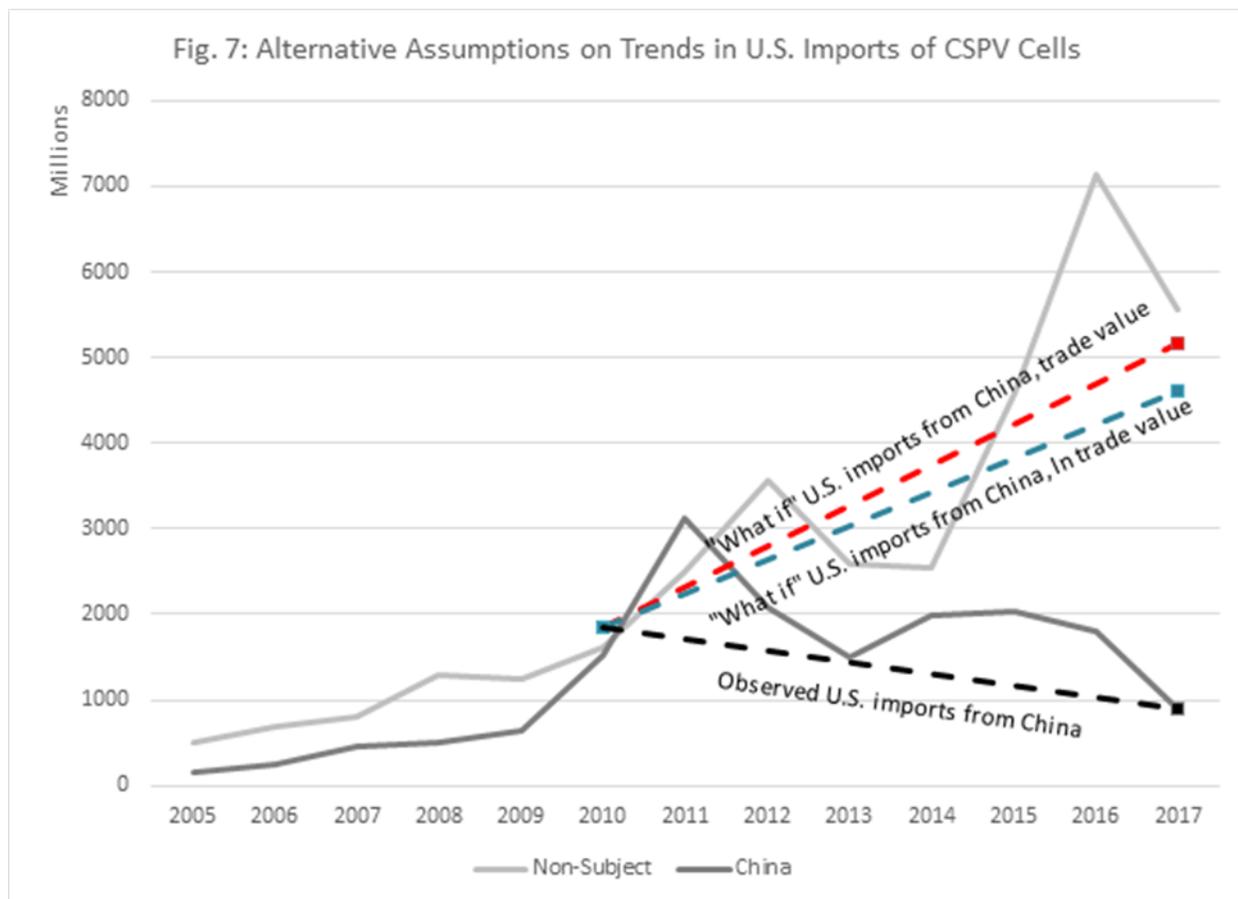
The model in equation (4) assumes that without antidumping duties, U.S. imports from China would have increased by the same percentage as the comparison group.⁸¹ It is referred to as DID in growth rates and can be approximated using the log of imports if the percent changes are not large. China recognizes that these are two fundamentally different models.⁸²

82. Figure 7 illustrates China’s conflicting parallel trends assumptions. The blue dashed line illustrates the assumed counterfactual trend in imports from China under the multiplicative model. It connects U.S. imports from China in the base period trade to their value if they had grown by 149 percent like non-subject imports. The red dashed line illustrates the assumed counterfactual trend under the additive model. It connects imports from China in the base period to their value if they had followed the same linear trend as non-subject imports. The black dashed line connects imports from China in the base period to observed U.S. imports from China in 2017. China’s assertion that DID in levels and logs are simply two approaches and that “one is not necessarily better or worse than the other” is not accurate.⁸³ Critically, these two assumptions are mutually exclusive: either parallel additive trends or parallel multiplicative trends may hold, but never both. If one approach is correct, the other must be incorrect. Thus, estimates obtained using both approaches together necessarily are biased.

⁸¹ Ciani and Fisher, (Exhibit USA-61) .

⁸² China’s methodology paper paras 99-100.

⁸³ China’s methodology paper para 105.



83. China asserts that an average of estimates of two models with fundamentally different underlying assumptions should be accepted by the Arbitrator because the choice between the two would be arbitrary.⁸⁴ There is no reason that the choice between these two models would need to be arbitrary. Well-regarded economics literature, which China has cited in its methodology paper, provides extensive guidance. One way to start is by plotting trade data in levels and logs to visually examine trends prior to the imposition of antidumping duties, as illustrated in Figures 1 and 2. Such a step might suggest whether multiplicative or additive trends are more reasonable. Moreover, regression DID analysis allows for formal testing via standard econometric specification tests for which there are built-in routines in most statistical software.⁸⁵

China’s Examination of the Robustness of its Estimates Is Inadequate

84. The additional specifications that China submitted as robustness checks broaden the scope in terms of product coverage. Instead of confining itself to the product lines covered by the HTS codes relevant to the 2012 order, China’s analysis uses data on trade flows under the corresponding HTS2 and HTS4 categories. These results are equally as flawed as the estimates on which China’s final estimate of nullification or impairment is based. The HTS2 and HTS4

⁸⁴ China’s Methodology Paper, para 121.

⁸⁵ See Exhibit USA-61.

analysis only uses World as a comparison group and only calculates nullification or impairment using tabular DID in logs. The U.S. written submission explains why using World as a comparison group violates the uniformity assumption and is therefore not a valid comparison group.⁸⁶ Nevertheless, the United States considers below whether expanding the product scope is a useful robustness check in the present context.

85. The HTS2 and HTS4 codes that correspond to the scope of the CSPV cells antidumping order are defined in Table IV.⁸⁷ By arguing that tabular DID analysis produces a valid estimate of nullification or impairment, China is arguing that the difference between the growth in comparison group imports in relation to China can be fully attributed to antidumping duties on CSPV cells. This seems unlikely.

86. Demand for products in Chapter 85 of the HTS Schedule was shaped by rapid and extensive technological change during the nearly 10-year period 2009-2017. For example, China's analysis assumes that differences in trends of imports from China relative to World of products that include DVD players and their parts are solely attributable to antidumping duties on CSPV cells. Under this assumption, the massive shift toward home entertainment through streaming services has had an identical impact on trends in imports from China and imports from World. At best, the degree to which this strong assumption is reasonable is an empirical question that China does not attempt to address.

87. China acknowledges that trends in HTS2 and HTS4 imports might not be representative of trends in imports of CSPV cells.⁸⁸ China's methodology paper suggests that the extent to which this is true depends on the subject HTS10 codes' share of the corresponding HTS2 and HTS4 imports. However, China does not provide any parameters to define the point at which it is reasonable to assume subject HTS10 codes represent a sufficient portion of imports such that it is reasonable to conclude the trends are representative.⁸⁹ China presents no evidence or argument that the broadened product scopes China examines are sufficiently representative in any case.

88. Unlike the analysis the United States has presented, China's HTS2/HTS4-based analysis does not reveal any additional information about whether China's assumption of parallel trends is reasonable. China's analysis does not reveal any information about whether spillover effects on imports from non-subject countries may bias China's estimates. China ignores the large differences between estimates of nullification or impairment using World versus Non-Subject using the same metric. This may otherwise suggest that China's disregard for the uniformity requirement biases its estimates of nullification or impairment. China's examination of the robustness of its estimates is thus severely inadequate.

⁸⁶ U.S. Written Submission, para. 135.

⁸⁷ See Exhibit CHN-1.

⁸⁸ China's Methodology Paper, para. 92.

⁸⁹ The 10-digit codes that make up CSPV cells represented an average of 25 percent of total U.S. imports from the world during 2009-2012 under HTS 8501, 8507 and 8541, and an average of 34 percent for China.

Table IV: Comparison Groups Based on Aggregation to HTS2 and HTS4

Aggregation	HTS Code	Description
HTS2	85	Electrical Machinery and Equipment and Parts Thereof; Sound Recorders and Reproducers, Television Recorders and Reproducers, Parts and Accessories
HTS4	8501	Electric motors and generators (excluding generating sets)
	8507	Electric storage batteries, including separators therefore; parts thereof
	8541	Diodes transistors and similar devices; photosensitive semiconductor devices; light-emitting diodes; mounted piezoelectric crystals; parts thereof

b. The United States rejects China's claim of data unavailability by stating that "there is a wealth of data on trade, and drivers of trade, that is publicly available for several countries at regular time intervals."

ii. To the United States: Could the United States please provide publicly available data sources on trade and drivers of trade that it deems relevant for the current dispute?

Response:

89. As explained in the U.S. written submission,⁹⁰ DID analysis (either the tabular or the regression approach) is not an appropriate methodological framework for estimating the level of nullification or impairment in this proceeding. Nevertheless, the U.S. written submission also demonstrates that, contrary to China's assertion,⁹¹ data availability does not limit China's ability to use regression DID to control for some of the violations of DID requirements in its implementation of the DID tabular approach. We have discussed this further above in the U.S. response to subpart (a) of this question.

90. The appropriate data sources would vary depending on the antidumping duty order and the comparison group countries used by China in its methodology paper. Relevant data may include macroeconomic data (*e.g.*, exchange rates), trade policy indicators (*e.g.*, a preferential trade agreement in a comparison country), or domestic policy indicators (*e.g.*, measures that

⁹⁰ See *e.g.*, section IV.A. of the U.S. Written Submission.

⁹¹ China's Methodology Paper, para. 39.

affect a country's export competitiveness). Macroeconomic data, for instance, is widely available from the International Monetary Fund. Information on trade and domestic policy is available from the WTO, the Organization for Economic Co-operation and Development, the United Nations Conference on Trade and Development, and other international organizations. Additionally, a number of organizations, most prominently the USITC in the United States, maintain public databases of variables commonly used to describe trade flows in gravity models of trade. For instance, the USITC maintains its "Dynamic Gravity dataset," a publicly available and free source of data describing bilateral relationships among 285 countries. The dataset includes macroeconomic data and measures of trade policy and institutional stability that may influence import trends over time.

18. To the United States: The United States argues that the set of HTS10 codes to which anti-dumping duties are applied in what the United States calls the initial period are not the same as the set of HTS10 codes to which anti-dumping duties are applied in 2017 in some significant cases (for example, OCTG). According to Exhibit CHN-22, however, the HTS10 codes identified for OCTG are the same between what the United States calls the initial period and 2017.

- a. Please clarify whether in using the term "initial period" the United States refers to what China calls the "pre-intervention period" or "benchmark period" in its methodology paper.**

Response:

91. The term "initial period" refers to the year in which the antidumping duty orders were issued. This is not the same as what China refers to as the "pre-intervention" or "benchmark" period, by which the United States understands China means the years immediately preceding the antidumping duty order.⁹²

- b. Does the United States agree that the set of HS10 codes identified for OCTG did not change between the initial period and 2017?**

Response:

92. Yes.

- c. If so, why is the stability assumption affected with respect to OCTG when the set of HS codes are the same between the initial period and 2017?**

Response:

93. The stability assumption is affected (thus leading to inflated estimates of nullification or impairment in *OCTG*, as in every other antidumping duty order at issue in this proceeding)

⁹² China's Methodology Paper, para. 75.

because of spillover effects.⁹³ The trend in U.S. imports from countries that have increased because of spillovers cannot possibly be representative of the trend that would have been followed by China “but for” the antidumping duties. This is true regardless of whether or not the reference HTS10 codes have changed over time because neither of China’s two, highly-aggregated comparison groups are adjusted to eliminate countries that have benefitted from spillovers.

20. As part of a robustness check, China conducts "the DID growth rate estimates using the HS4 and HS2 import trade associated with the HS10 products subject to the WTO-inconsistent duties". The United States argues that "China does not appear.

d. To the United States: Could the United States please clarify if the trade value for US imports of coated paper, displayed in Figure 3 and Figure 4 of the United States' written submission, is reported at the HS2, HS4 or HS10 level? Could the United States clarify if the time period is from 2000 to 2017 as indicated in the text, or from 2000 to 2009 as indicated in the figures?

Response:

94. The data in Figures 3 and 4 of the U.S. written submission represent HTS10-level data corresponding to the correct scope of the antidumping duty order on coated paper, which is provided in Exhibit USA-1. Figures 3 and 4 display data from 2000-2009, the ten years prior to the imposition of antidumping duties in 2010. Figures 3 and 4 establish that there is no basis in historical import data for the parallel trends assumption in the coated paper anti-dumping duty order. The reference to “2000 to 2017” in paragraph 146 of the U.S. written submission is an inadvertent error. The United States regrets any confusion caused.

22. To the United States: Could the United States please explain:

a. Which standard statistical procedure it would propose to test whether the differences in the benchmark and the robustness check results are approximately zero?

Response:

95. The U.S. written submission explains that, in many cases, the estimates of nullification or impairment produced by China’s handful of DID specifications were not similar, as China claims in its methodology paper.⁹⁴ By examining the large variance or range comparing the lowest estimate and highest estimate, one can conclude that the differences are not approximately zero. The table below highlights some of the more egregious instances among the antidumping duty orders identified in China’s methodology paper in connection with its “as applied” claims. In *PET Film*, the highest estimate is more than eleven times larger than the lowest estimate. In

⁹³ See U.S. Written Submission, para. 134.

⁹⁴ U.S. Written Submission, para. 153.

CSPV Cells, which represents the largest single estimate of nullification or impairment, the highest estimate is 2.5 times larger than the smallest. This is a difference of nearly **\$3 billion**.

Table V: Comparison of China’s N/I estimates under various DID specifications

AD Orders	Requested N/I(\$US millions)	DID Levels	DID Levels	DID Growth	DID Growth	DID Growth	DID Growth	Ratio highest lowest
		<i>Non-Subject</i>	<i>World</i>	<i>Non-Subject</i>	<i>World</i>	<i>HTS4</i>	<i>HTS2</i>	
<i>Shrimp</i>	\$1,218	\$1,360	\$2,738	\$419	\$352	\$369	\$452	7.78
<i>Pet Film</i>	\$181	\$306	\$333	\$36	\$47	\$30	\$33	11.1
<i>OCTG</i>	\$1,593	\$1,906	\$1,156	\$2,064	\$1,243	\$1,081	\$1,579	1.9
<i>Wood Flooring</i>	\$247	\$301	\$455	\$144	\$87	\$355	\$332	5.2
<i>CSPV Cells</i>	\$3,233	\$4,273	\$3,106	\$3,698	\$1,852	\$1,726	\$1,575	2.5

96. China’s assertion that these results address questions of bias on their own is utterly without foundation.⁹⁵ Given this wide variation, China’s assertion that its various nullification or impairment estimates are similar must be supported by evidence. The statistical procedures the United States would propose cannot be implemented using DID tabular analysis. They would require either “F-tests” or “t-tests” within a linear regression model. For a demonstration, the United States refers the Arbitrator to the U.S. response to question 17(a).

97. Finally, none of China’s estimates are obtained from models that satisfy the requirements for DID analysis. Thus, China’s estimates are meaningless as measures of nullification or impairment.

b. How it would implement such statistical procedure?

Response:

98. Some of the model results could be formally compared using a linear regression model within which multiple specifications are nested.⁹⁶ Other comparisons may be conducted by

⁹⁵ China’s Written Submission, para. 105.

⁹⁶ See McDowell, *Testing the Equality of Coefficients Across Independent Areas*, 2006, STATA (Exhibit USA-31).

estimating multiple specifications simultaneously using seemingly-unrelated regression.⁹⁷ For a demonstration, the United States refers the Arbitrator to the U.S. response to question 17(a).

24. To the United States: With respect to the growth-based DID tabular approach, could the United States please:

a. Explain with an illustrative example how it would implement the growth-based DID tabular approach?

Response:

99. As explained in the U.S. written submission,⁹⁸ DID analysis (either the tabular or the regression approach) is not an appropriate methodological framework for estimating the level of nullification or impairment in this proceeding. Nevertheless, the U.S. written submission also points out that China’s growth-based DID was not equivalent to DID in growth rates.⁹⁹

100. To clarify, China’s calculation of DID effects is equivalent to tabular DID using the natural logarithm (henceforth, “log”) of imports. However, contrary to China’s assertions, it is not equivalent to DID in growth rates. Using the log value of trade is a convenient approximation to the value implied by growth-based DID. This approximation works well if trade growth is small, but worsens as the percent changes grow larger.

101. The United States illustrates a correct implementation of growth-based tabular DID using CSPV cells, which involves large changes in trade. U.S. imports from China declined 51 percent, total world imports increased 49 percent, and non-subject imports increased 149 percent. China’s calculation of nullification or impairment using tabular DID in the log of imports with imports from the world as a comparison group is presented in Table VI:

Table VI: Tabular DID in the Log-Value of Trade

Source	Base Imports (log)	2017 Imports (log)	Difference	% Change in imports
China	7.52	6.80	-0.72	-51%
World	8.38	8.78	0.40	49%
“Diff-in-Diff”			-1.12	
N/I%			-67%*	-100%

*N/I% is calculated from “Diff-in-Diff” in logs: $\exp\{-1.12\}-1=-0.67$

102. According to the log approximation, China’s imports would be 67 percent larger in the absence of antidumping duties, whereas using growth rates implies they would be 100 percent larger. The approximation is thus poor in the case of CSPV cells.

⁹⁷ See Testing Equality of Coefficients from Two Different Regressions (Exhibit USA-32).

⁹⁸ See, e.g., U.S. Written Submission, paras. 115-156.

⁹⁹ *Id.*

103. For illustrative purposes, imagine that the growth in trade was smaller. Table VII repeats the calculations in Table VI for an imaginary product for which imports from China declined by 2 percent and imports from the world increased by 4 percent. In this case, the nullification or impairment estimate calculated in logs is almost identical to that calculated using growth rates.

Table VII: Tabular DID vs. Growth Rates with Small Changes

Source	Base Imports (ln)	2017 Imports (ln)	Difference	% Change in imports
China	7.52	7.50	-0.02	-2%
World	8.38	8.43	0.04	4%
“Diff-in-Diff”			-0.06	
N/I%			-5.8%*	-6%

*N/I% is calculated from “Diff-in-Diff” in logs: $\exp\{-0.06\}-1=-0.058$

104. The United States again emphasizes that tabular DID estimates are meaningless because the required assumptions of parallel trends, stability, and uniformity cannot be met in any of the antidumping duty orders at issue in this proceeding. Moreover, the final estimates of nullification or impairment presented by China for each antidumping duty order are averages of estimates obtained from tabular DID in the level of import values and estimates obtained from DID in the log of import values.

105. As noted in China’s primary reference, Angrist and Pischke (2008),¹⁰⁰ and detailed in Ciani and Fisher (2019),¹⁰¹ and as discussed above in the U.S. response to question 17(a), a DID model may be applied to a variable in levels or in growth rates, but the parallel trends standard can only be met in either levels or growth rates, not both. Estimates from at least one of these metrics must be statistically biased.¹⁰² Therefore, the average of the two values is also necessarily statistically biased.

b. Provide theoretical and econometric studies using the growth-based DID tabular approach described in its response to part (a) of this question?

Response:

106. The United States is unaware of any published theoretical or econometric studies using growth-based DID tabular analysis in economics. The demands imposed by the required

¹⁰⁰ Angrist, J. D., & Pischke, J. S. (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press (Exhibit USA-23).

¹⁰¹ Ciani, (Exhibit USA-61).

¹⁰² *Id.*

assumptions are difficult to satisfy in economic data because valid DID tabular methodology requires the policy of interest to be applied such that it approximates a randomized treatment.¹⁰³

107. However, Ciani and Fisher (2019) discuss the differences between levels-based DID models and growth-based DID models. While Ciani and Fisher present the empirical form of each model in the form of regression DID, the presentation of the theoretical form of each model is instructive in how to calculate growth-based DID tabular.

3.1.4 Calculation

28. In its methodology paper, China presents alternative estimates to adjust for "the relative size of the anti-dumping duties (found to be WTO-inconsistent in DS471) and the countervailing duties (not addressed in DS471)". However, in China's written submission, the revised estimate does not seem to have adjusted for the countervailing duties. In the adjustment of the impact of the countervailing duties in the methodology paper, China suggests that it performs the adjustment by computing "the relative net addition of the CVD rate relative to the total AD and CVD margins" for each type of applied duty in each case, and then takes the average share across the three types of reported rates (individual rates, all-other rates, and PRC-wide rates). In the calculation presented in Exhibits CHN-6 and CHN-14, however, it appears that China uses all-other rates and PRC-wide rates interchangeably in calculating the "CVD share of impact".

b. To the United States: Could the United States please explain whether the "relative size of the AD duties and the CVD" should be taken into account in computing the level of nullification or impairment?

Response:

108. The United States agrees with China that, for products covered by antidumping measures that are subject to "as applied" findings adopted by the DSB that also are covered by countervailing duties (CVD), which are not subject to findings adopted by the DSB, the method for estimating the level of nullification or impairment should measure the impact of the antidumping duties only, and should not include the impact of the countervailing duties.

109. China's proposed tabular DID method fails to isolate the impact on trade of the antidumping duties alone and fails in its attempt to correct this problem by adjusting China's grossly inflated initial estimate for the impact of the CVD measures. Furthermore, China averages the initial estimate of the level of nullification or impairment in its "average across all as applied estimates" presented in paragraph 9 of China's methodology paper, deriving a figure that is not equivalent to the level of nullification or impairment.

3.2 United States' Proposed Economic Model

¹⁰³ Technically, DID requires the policy to be implemented randomly, conditional on group and time fixed effects. See Bertrand (Exhibit USA-35).

3.2.1 Data Issues

29. **To the United States: Please respond to China's criticism of the United States' reliance on non-public and unverifiable data. In doing so, please clarify:**

- a. **Whether any of the non-public and unverifiable data relied on by the United States could be substituted by publicly available and verifiable data?**
- b. **If such publicly available and verifiable data cannot be provided, would it nonetheless be appropriate for the Arbitrator to use non-public and unverifiable data in determining the level of nullification or impairment? If so, please explain why.**

Response:

110. The United States is responding to both subparts of this question together. As explained in the U.S. written submission, each antidumping duty order at issue in this proceeding must be separately analyzed to determine which are the most accurate data available for determining the level of nullification or impairment associated with that antidumping duty order. After assessing data availability, the United States then determines the methodological framework that provides the most accurate estimate of nullification or impairment. To do so, the United States relies on a limited amount of confidential data, all of which has been provided to the Arbitrator with the U.S. responses to the Arbitrator's advance questions. In particular, the United States is providing updated data from CBP that provides the most accurate estimate of Chinese imports that are subject to the antidumping duty orders at issue in this proceeding.¹⁰⁴

111. For the antidumping duty orders where the United States applies the Armington-based approach, the United States has provided the following information to operate the model:

- The relevant antidumping duty rates (from the China-government entity rate to a separate rate, where applicable, both of which are public and included in Exhibit USA-5);
- The relevant elasticity parameter estimates for U.S. demand, U.S. supply, and substitution for each of the products at issue in this dispute. The elasticity parameters are public and are included (with explanations) in Exhibits USA-16 and USA-17.

¹⁰⁴ CBP, the federal agency that enforces antidumping duty orders, collects import data through an automated system, the Automated Commercial Environment (ACE), which we explain and demonstrate in Exhibit USA-66. Through ACE, CBP uses different computer entry types to distinguish different types of importations, such as normal consumption entries of goods, AD/CVD entries, warehouse entries, foreign trade zone entries, etc. The CBP data that the United States provided with the U.S. Written Submission only included standard AD entries (*i.e.*, type "03" entries in ACE). The updated data that the United States are providing with the U.S. responses to the Arbitrator's advance questions are more comprehensive for they account for other antidumping entry types, including withdrawals from warehouses (*i.e.*, type "34" entries in ACE), FTZ entries (*i.e.*, type "06" entries in ACE), and withdrawals from warehouses with quota combination (*i.e.*, type "38" entries in ACE).

Note that both petitioners and respondents can comment on elasticity parameters during an antidumping investigation;

- The relevant U.S. import supply elasticity from the third countries, subject China, and non-subject China are assumed for simplicity at 10 (and this is public). Import supply elasticities are generally more elastic than domestic supply elasticities due to the additional factor of the ability of countries to shift products between export markets in response to relative price changes. If the import supply elasticities were assumed equal to the U.S. domestic supply elasticity, the level of nullification or impairment would be lower. More information on this elasticity is provided in the U.S. responses to questions 46, 47, and 48;
- U.S. domestic shipment data for 2017. Calculations for each antidumping duty order were provided in Exhibit USA-13 using public information. The United States, to better assist the Arbitrator in understanding these calculations, provides a fuller explanation of each of the calculations in Exhibit USA-58;
- U.S. import data from the rest of the world, which is public information based on applicable 10-digit HTS categories for each antidumping duty order. The United States uses import information for the relevant 10-digit HTS categories for this import data (recognizing that it may overestimate imports of the actual product) because it is the only information available for third country shipments to the United States;
- U.S. import data from subject China and non-subject China, both of which are confidential and provided by CBP in Exhibit USA-30. While this data cannot be substituted with publicly available data, it is appropriate to use in this proceeding because it provides the most accurate estimate of Chinese imports that are subject to the antidumping duty orders at issue in this proceeding. Through its automated ACE system, which we explain in Exhibit USA-66, CBP collects data that allows the United States to determine which Chinese imports fall under the China-government entity rate. As the federal agency that enforces antidumping duty orders, CBP assesses antidumping duties and collects antidumping duty cash deposits at the China-government entity rate on imports of Chinese companies. Note that the import value associated with the China-government entity overestimates the import value occurring under rates that have been found WTO-inconsistent.

112. For the five antidumping duty orders where the United States applies the formula-based approach, the United States has provided U.S. import data that accurately reflects the value of U.S. imports subject to the China-government entity rate and the value of U.S. imports subject to other rates under each individual case. The United States constructs the share of imports from the China-government entity during the period of investigation using data on imports from China that accurately measures the value of U.S. imports subject to antidumping duties in each individual case.

113. The USDOC used a two-step process to calculate the relevant share of total U.S. imports that was assigned the China-government entity rate (subject China) and the share of total U.S.

imports that was assigned separate rates (non-subject China). The first step determined the actual level of imports by companies that were assigned to the China-government entity in general (Group 3 and 4). The second step, when available, involved separating Group 4 imports from Group 3 imports using the share of non-responses to the USDOC's questionnaires in each investigation.¹⁰⁵ While these data are confidential, it is nonetheless appropriate to use the data here because it directly correlates to the imports covered by the antidumping duty orders at issue in this proceeding.

114. The United States applied the formula-based approach for five antidumping duty orders where the United States believes that the Armington-based approach would not be reasonable. The United States, however, provides the relevant share information for each antidumping duty order under review in Exhibit USA-54

115. The limited amount of confidential data that the United States relies on is the best data available to accurately estimate the trade effects of the U.S. proposed counterfactual. In contrast, China has provided the Arbitrator with basket HTS categories that grossly overestimate the level of nullification or impairment. In addition, for some antidumping duty orders, China has inappropriately broadened the category of applicable trade data,¹⁰⁶ thus further inflating its estimate of nullification or impairment.

30. To the United States: China points to two problems regarding the import data that the United States use in calculating the amount of the nullification or impairment. First, China points out that the United States uses the value of trade in 2017 for exporters or producers within the PRC-wide entity based on confidential data collected by the USDOC and US Customs and Border Protection, which China does not have access to. China contends that since the United States provides no documentary back-up for its reported values, China cannot verify the reported numbers and replicate the United States' calculations. Second, China argues that the data in Exhibit USA-13 is "riddled with mistakes" and China is unable to determine how serious the mistakes are due to the United States' failure to provide source material

a. Do you agree with the concern raised by China regarding the aggregated nature of the import data used by the United States in its calculations? If so, how do you propose to address this concern?

Response:

¹⁰⁵ Further information on how USDOC calculated this share information, see Exhibit USA-55.

¹⁰⁶ In *Off-The-Road Tires*, *Wood Flooring*, and *Steel Nails*, China did not apply the correct scope for 2017 when querying and compiling trade data. In these three antidumping duty orders, China included numerous HTS codes that were not part of the three antidumping duty orders at the beginning of 2017, which is the baseline for the counterfactual. For instance, in *Wood Flooring* and *Off-The-Road Tires*, China relies on USDOC Federal Register notices that were published in June 2017, which added a significant number of HTS codes to the scopes of the two antidumping duty orders. See Exhibit CHN-22, Attachment B.

116. As the United States explained in the U.S. response to question 29, the United States has provided data with its response to the Arbitrator’s advance questions that reflects the most accurate estimate of Chinese imports that are subject to the antidumping duty orders at issue in this proceeding.

117. The data on the value of imports subject to antidumping duties that is used by the United States is collected by CBP, the federal agency that collects the duties, through its automated system, ACE, which we explain in Exhibit USA-66. ACE is the system through which traders report imports and exports.¹⁰⁷ In addition, ACE is the system through which the U.S. government determines admissibility. ACE provides the most accurate source of data regarding antidumping duties collected by the U.S. government. For each antidumping duty order at issue in this proceeding, CBP is able to precisely determine which imports fall under the China-government wide entity.

118. Capturing total trade flows occurring under the HTS codes, as China has done in this proceeding, is inappropriate for this proceeding because it over-estimates the value of trade subject to antidumping duties. Many of the reference HTS codes are broad categories, of which the product subject to an antidumping order is a subset. In addition, reliance on HTS codes results in some double-counting of the value of U.S. imports from China that are subject to duties, as the HTS codes for *Circular Welded Carbon Quality Steel* (A-570-910) and *Circular Welded Carbon Quality Steel Line Pipe* (A-570-935) overlap.

119. In Exhibit USA-30, the United States provides updated U.S. import data collected by CBP by specific exporter/producer that have been assigned an antidumping duty rate lower than the China-government entity rate. As the United States explained in footnote 100, the CBP data that the United States provided with the U.S. Written Submission only included standard antidumping entries (*i.e.*, type “03” entries in ACE). The updated data are more comprehensive, as they account for other antidumping entry types, including withdrawals from warehouses (*i.e.*, type “34” entries in ACE), Free Trade Zone entries (*i.e.*, type “06” entries in ACE), and withdrawals from warehouses with a quota combination (*i.e.*, type “38” entries in ACE). China, however, has yet to demonstrate actual instances where the CBP data are not accurate for an antidumping order at issue in this proceeding. To better assist the Arbitrator, the United States provides additional information on sources and data in response to question 29 above.

120. Contrary to China’s assertion, Exhibit USA-13 is not “riddled with mistakes.”¹⁰⁸ While there were some errors in Exhibit USA-13, these have been corrected.¹⁰⁹

- b. Please provide the underlying data based on which the United States computed the import figures in Exhibit USA-13, including imports from companies in the PRC-wide entity (which Exhibit USA-13 refers to as "Subject Imports from China"), as well as "Imports from Rest of China"**

¹⁰⁷ See Exhibit USA-66.

¹⁰⁸ China’s Written Submission, para. 175.

¹⁰⁹ Exhibit USA-31.

(which according to the United States comprises imports from China that are not from the PRC-wide entity).

Response:

121. See Exhibits USA-30 and USA-57

31. To the United States: China also notes that the United States "[i]n some cases ... extrapolates 2017 domestic shipment data" and "in many other cases ... appears to use very questionable data sources and also undertakes arbitrary adjustments".

a. Please comment on the specific concerns raised in paragraphs 182-183 of China's written submission.

Response:

122. Before responding to China's assertions, the United States observes that Exhibit USA-58 provides calculations done by USITC industry analysts of 2017 U.S. domestic shipments for the products at issue in this proceeding. The USITC is an independent federal agency with expertise in analyzing trade, trade policy, and their impacts on U.S. industry sectors. USITC experts (economists and industry analysts) calculate and publish domestic shipment data in the relevant reports, including reports on AD/CVD investigations. The USITC's estimates are the most reasonable and transparent estimates given the public information that is available.

123. In the bulleted list below, the United States replies to the bulleted list between paragraphs 182 and 183 of China's written submission:

- Regarding antidumping duty orders A-570-875 (pipe fittings) and A-570-909 (steel nails) China asserts that the United States "uses overbroad industry shipment data." The U.S. calculations of U.S. domestic shipments for these two products are included in Exhibit USA-58. For A-570-875 (pipe fittings), the United States used the industry and U.S. export data provided by the USITC, as no other public data sources were readily available. For A-570-909 (steel nails), the United States used industry shipment data, as no other public data sources were readily available. The USITC, however, reduced the estimate in Exhibit USA-58 by 17 percent to account for non-subject products.
- China asserts that, for antidumping duty order A-570-952 (narrow woven ribbons), the United States "not only utilizes overbroad industry shipments data, the United States does not even specify what industry is used." The U.S. calculations of U.S. domestic shipments of narrow woven ribbons are included in Exhibit USA-58. Regarding China's first assertion, we note that the industry shipment data pertains to a specific category of narrow woven ribbons (width not exceeding 12 inches, and with woven selvedge, as classified in the HTS subheading 5806.21.10). Regarding China's second assertion, the U.S. shipment data came from the Annual Survey of Manufacturers for Narrow Woven Ribbons (12 inches or less in width).

- China asserts that, for antidumping duty orders A-570-910 (circular welded carbon quality steel pipe) and A-570-935 (circular welded carbon quality steel line pipe), the United States “utilizes proprietary industry data (Preston Pipe and Tube) where product definition does not perfectly match the product scope of the AD cases.” The U.S. calculations of U.S. domestic shipments for these two products are included in Exhibit USA-58. For both A-570-910 (circular welded carbon quality steel pipe) and A-570-935 (circular welded carbon quality steel line pipe), the United States reported the best estimate available due to a lack of detailed information that is publicly available.
- China asserts that, for antidumping duty orders A-570-875 (pipe fittings) and A-570-042 (stainless steel sheet and strip), the United States “utilizes export data to adjust U.S. domestic shipment data.” The U.S. calculations of U.S. domestic shipments for these two products are in Exhibit USA-58. For both A-570-875 (pipe fittings) and A-570-042 (stainless steel sheet and strip), the United States did not include export data in its estimate. Rather, export data were used as a proxy to estimate the subject product’s share of a larger category of U.S. domestic shipment data. For example, for pipe fittings, a broader category included other products beyond the subject product. To determine the subject product’s share of this larger U.S. shipment category, U.S. export data were used to see what was the subject product’s share of a similar product category, and then applied that share to the shipment data.
- China asserts that, for antidumping duty orders A-570-016 (truck tires) and A-570-893 (shrimp), the United States “uses production data not shipment data, for data adjustments.” The U.S. calculations of U.S. domestic shipments for these two products are included in Exhibit USA-58. For A-570-016 (truck tires), the United States used shipment volume and unit value data, not production data, to calculate 2017 estimates, as sourced from the USITC publications. Regarding A-570-893 (shrimp), the United States utilizes the USITC reports from AD/CVD investigations, which include both raw shrimp production data and a shipment estimate as obtained from the USITC questionnaires issued to shrimp processors. The questionnaire-based shipment figures capture value added by processors, but they do not cover the entire industry, and they may include some shipments of products made from imported inputs. The method used in this particular estimate relies only on public data.
- China asserts that, for antidumping duty order A-570-977 (steel cylinders), the United States “uses production data, not shipment data, for data adjustments.” The U.S. calculations of U.S. domestic shipments for steel cylinders are included in Exhibit USA-58. The estimated share is a best estimate due to lack of more detailed information that is publicly available.

b. Could the United States compute domestic shipment data based on publicly available information that can be verified by the Arbitrator and China?

Response:

124. The U.S. domestic shipment data reported in the U.S. written submission and in these replies use publicly available information and transparent calculations that the Arbitrator and China can verify.

32. To the United States: The United States has not yet provided an estimate of the level of nullification or impairment for Steel Wire Rod. Could the United States please explain why this case is not included in the estimate and provide the relevant data?

Response:

125. There were no U.S. imports of the subject product in 2017.¹¹⁰ Given that there were no U.S. imports from Chinese importers or exporters receiving the separate rate of 93.18 percent, it is unlikely that Chinese companies that were subject to the China-government entity rate of 110.25 percent would have exported to the United States in significant amounts. Thus, the U.S. estimate of the level of nullification or impairment for steel wire rod is zero.¹¹¹

33. To the United States: The United States has not yet provided an estimate of the level of nullification or impairment for Furniture, which is one of the five cases for which the United States proposes to apply the formula-based approach. Could the United States please provide the relevant data for the calculation of the level of nullification or impairment?

Response:

126. The estimated level of nullification or impairment for *Wooden Bedroom Furniture* using the formula-based approach is zero because mandatory and separate-rate respondents' share accounted for all of the imports during the period of investigation. The data on *Wooden Bedroom Furniture*, as well as the table with updated data for the other four antidumping duty orders for which the United States estimated the level of nullification or impairment using the formula-based approach, is provided in Exhibit USA-53.

34. To the United States: The Arbitrator notes the following data discrepancy for Passenger Vehicle and Light Truck Tires: The "total U.S. imports from China under the PRC-Wide Rate" is listed as \$3,050,490 (\$3.05 million) in Exhibit USA-21. However, the imports from the exporters or producers in the PRC-wide entity is listed as \$302.6 million whereas the "Imports from Rest of China" is listed as \$3.05 million in Appendix IX of Exhibit USA-13. Could the United States please confirm which number is the correct value of imports subject to PRC-wide rate?

Response:

¹¹⁰ See Exhibit USA-54.

¹¹¹ Exhibits USA-54 and USA-30 provide information on individual company antidumping duty rates, the China-government entity rate, and U.S. imports by exporter/producer.

127. The correct value of imports subject to the China-government entity rate is \$3.05 million. While there is an inadvertent error on the first page of Appendix IX of Exhibit USA-13, the second page of Appendix IX of Exhibit USA-13 provides the correct data. The United States used the correct data when it ran the model. The United States regrets any confusion.

128. In the U.S. written submission, U.S. imports from China under the China-entity rate were listed as \$3,050,490 (\$3.05 million) and U.S. imports from the “Rest of China” were listed as \$302.6 million in 2017. The United States, however, has updated the data with this submission.¹¹² Under the updated 2017 data, total U.S. imports from China under the China-government entity rate are \$4,674,175 (\$4.67 million) and imports from the rest of China are \$304.6 million.

35. To the United States: The Arbitrator notes the following data discrepancy for the anti-dumping duty rate in Ribbons: In Exhibit USA-5, the current PRC-wide rate is listed as 247.26%, but in Appendix XIV of Exhibit USA-13, the PRC-wide rate is listed as 246.26%. Could the United States please clarify which number is correct?

Response:

129. The correct China-government entity rate is 247.26 percent.

3.2.2 Choice of Methodology

36. To the United States: The Arbitrator understands that the United States' choice of methodology (the Armington-based model and the formula-based approach) follows from its proposed counterfactual, i.e. reducing certain duty rates in the 25 anti-dumping orders at issue. If the Arbitrator were to choose another counterfactual, could it still use the calculation methodology proposed by the United States to estimate the level of nullification or impairment?

Response:

130. As explained the U.S. written submission, each of the antidumping duty orders at issue requires separate analysis to determine the appropriate methodological framework for estimating the level of nullification or impairment. The U.S. choice of methodology is driven by the application of the facts of a particular antidumping duty order to the counterfactual proposed by the United States. Thus, it is not possible to answer the Arbitrator’s question definitively without knowing what alternative counterfactual might be contemplated. Nevertheless, the Armington-based model and the formula-based approach could be adapted to a counterfactual that captures the impact of antidumping duties on trade flows, which is the key issue in this proceeding. Both the Armington-based model and the formula-based approach define the level of nullification or impairment as the difference between the value of trade without the WTO-inconsistent aspects of the measures in 2017 (the counterfactual) and the actual value of trade in 2017.

¹¹² See Exhibit USA-30.

37. To the United States: China argues that the United States' use of the Armington-based model is "deeply flawed" because "[t]he tiny share of the market held by the PRC-wide entity firms makes it virtually impossible for the elasticity model to produce anything but a tiny N/I estimate" and therefore "the N/I estimates that follow from the model are biased downward and are unreasonable."

a. Could the United States please comment on the reliability of the Armington-based model when "[i]n many of the major cases underlying this dispute the United States models the impact of a very large reduction in the duty"?

Response:

131. China's argument, presented in Exhibit CHN-31, is based on a misunderstanding of the Armington Constant Elasticity of Substitution (CES) model. The Armington CES model does not, as China asserts, assume a constant price elasticity of demand. In fact, simple algebra shows that the price elasticity of demand varies with the size of the price change. Additionally, the U.S. analysis utilizes *ad valorem* tariff rate changes (*i.e.* percent change of baseline price) and not dollar value changes. For these reasons, the examples in Exhibit CHN-31 are completely irrelevant to the antidumping duty orders at issue in this proceeding. In fact, China's assertions would only be relevant to the simple textbook examples referenced in Exhibit CHN-31.

132. In Exhibit CHN-31, China asserts that the predictions of "elasticity models" become systematically less accurate as the magnitude of the tariff changes grow. For the CES Armington model, there is, in fact, no literature to support this assertion. The price elasticity of demand varies with the size of the price change, so there is no reason to suggest that the estimates generated by the Armington model are unreasonable, as China does. Also, a technical way to verify that the Armington model is reliable in estimating the impact of a very large reduction in the duty would be to use a piece-wise solution method, for example the Euler method, where for each piece the constant substitution elasticity is more appropriate than in the one-step framework.¹¹³

133. China's written submission alludes to "elasticity models," but it is not clear what class of models China is referencing. The United States uses a Constant Elasticity of Substitution Armington model. This type of simulation model has been the industry standard¹¹⁴ for trade

¹¹³ See Riker, *Multinational Production and Employment in an Industry-Specific Model of Trade*, U.S. International Trade Commission, Working Paper 2018-08-C (Exhibit USA-67).

¹¹⁴ See *e.g.*, Anderson, J. E. (1979): "A Theoretical Foundation for the Gravity Equation," *American Economic Review*, 69(1), 106-116; Anderson, J. E., and E. Van Wincoop (2003): "Gravity with Gravititas: A Solution to the Border Puzzle," *American Economic Review*, 93(1), 170-192; Armington, P. S. (1969): "A Theory of Demand for Products Distinguished by Place of Production," *International Monetary Fund Staff Papers*, 16, 159-178; Balistreri, E. and Thomas F. Rutherford (2011): "Computing General Equilibrium Theories of Monopolistic Competition and Heterogeneous Firms," *Handbook of CGE Modeling*, Vol 1; Balistreri, E., R. Hillberry, and T. Rutherford, (2011): "Structural estimation and solution of international trade models with heterogeneous firms," *Journal of International Economics*; Chaney, Thomas, (2008): "Distorted Gravity: The Intensive and Extensive Margins of International Trade," *The American Economic Review*; Devarajan, S., Delfin S. Go, Jeffrey D. Lewis, Sherman Robinson, and Pekka Sinko, (1997) "Simple General Equilibrium Modeling," in *Applied Methods for Trade Policy Analysis*; Dixit, A. K. and Joseph E. Stiglitz, (1977): "Monopolistic Competition and Optimum Product Diversity," *The American*

analysis since the late 1960s and is utilized by governments around the world and international organizations, such as the World Bank.¹¹⁵ The global general equilibrium modelling community has spent some 45 years using this class of models to analyze the economic impacts of shocks to trade policy. Thus, among economists, the results of an Armington model are not difficult to understand.

134. Additionally, the CES Armington class of models generates an empirical model that accurately predicts bilateral trade flows. The equations derived from the CES Armington class of models are the Gravity Model equations. The Gravity Model predicts international trade flows more accurately than any other empirical trade model.¹¹⁶

135. Besides failing to acknowledge that the CES Armington model is the universal industry standard, China has not demonstrated that the CES Armington model is inappropriate in this proceeding. If China has a model that matches the predictive capacity of the Armington CES model and is appropriate for this proceeding, China should provide such a model to the Arbitrator.

- b. Could the United States please comment on the reliability of the Armington-based model when the firms selling under the PRC-wide entity rate have a "tiny share of the relevant product market as a whole"?**

Response:

136. Technically, the Armington model can be used as long as there are some imports. In this proceeding, the relevant scope of imports to be analyzed to correctly estimate the level of nullification or impairment, based on the DSB's recommendations related to the Single Rate Presumption and the China-government entity rate, is the Chinese merchandise that falls under Group 4.¹¹⁷

Economic Review; Dixon, P.B., B.R. Parmenter, J. Sutton and D.P. Vincent (1982): "ORANI: A Multisectoral Model of the Australian Economy," Amsterdam, North Holland; Dixon, P.B. and Rimmer, M.T. (2002): "Dynamic General Equilibrium for Forecasting and Policy," Elsevier, Amsterdam; Francois, J. (1998): "Scale Economies and Imperfect Competition in the GTAP Model," GTAP Technical Papers; Francois, J. and H. Keith Hall, (1997): "Partial Equilibrium Modeling," in Applied Methods for Trade Policy Analysis: A Handbook; Hertel, T. (2013) "Global Applied General Equilibrium Analysis Using the Global Trade Analysis Project Framework," Handbook of CGE Modeling, Vol 1.; Hosoe, Nobuhiro, K. Gasawa, and H. Hashimoto, (2015): *Textbook of Computable General Equilibrium Modelling: Programming and Simulations*, Palgrave Macmillan; Krugman, P. (1980): "Scale Economies, Product Differentiation, and the Pattern of Trade," American Economic Review, 70(5), 950-959; Melitz, Marc J. (2003), "The impact of trade on intra-industry reallocations and aggregate industry productivity", *Econometrica*, 71(6), 1695–1725.

¹¹⁵ See e.g., Armington, *A Theory of Demand for Products Distinguished by Place of Production*, Vol. 1, No.1, International Monetary Fund (Exhibit USA-68).

¹¹⁶ See Anderson, James E. Anderson, *A Theoretical Foundation for the Gravity Equation*, American Economic Review, 69 (1), 106-116 (1979) (Exhibit USA-69).

¹¹⁷ U.S. Written Submission, paras. 35-41.

137. Thus, in antidumping duty orders where the Chinese imports under Group 4 are a tiny share of total imports from China (*i.e.*, less than one percent), the United States proposes using the formula-based approach, which overestimates the level of nullification or impairment.

138. The CES Armington model only encounters a problem when trade between two economies is zero in a given category. In these situations, the model cannot provide reliable estimates.

38. To the United States: The United States applies a formula-based approach to calculate the level of nullification or impairment for five cases "where the share of U.S. imports assigned the China-entity rate is minimal" and further explains that "an appropriate minimal trade share for subject China imports is at least one percent of total imports."

a. The United States seems to have defined the share as "imports from China under PRC-wide rate as a share of total U.S. imports from China under the order". Could the United States please explain why it has not calculated the share as "imports by the PRC-wide entity relative to the U.S. market for the product as a whole" as suggested by China or imports from the PRC-wide entity relative to total US imports?

Response:

139. China's suggestion (*i.e.*, calculating the maximum share covered by the China-government entity during the period of investigation to the total value of all U.S. imports of the product in 2017) is not appropriate for it presumes that duties on Group 4 imports would be reduced to zero. Under the correct counterfactual, however, the only modification is that duties on Group 4 imports are changed from the rate assigned to the China-government entity to a separate rate.

140. Recall that no antidumping duties were applied during the period of investigation, so the maximum share covered by the China-government entity during the period of investigation is the share of China's imports of the product during the period of investigation absent any antidumping duty. China's overall share of total U.S. imports declined following the imposition of the U.S. antidumping measures. In the antidumping duty orders in which the United States has applied the formula-based approach, the China-government entity's share of China's share is less than one percent. Thus, the China-government entity's share of (the much larger) total U.S. imports is nearly zero. In the correct counterfactual, the China-government entity's would receive a separate rate (not a rate of zero) and thus would be similarly situated with other separate-rate Chinese companies shipping products to the United States.

141. Accordingly, it is reasonable to assume that the trade effects of reducing (but not eliminating) the antidumping duty rate applied to the China-government entity would be an increase in the value of shipments from the Chinese-government entity, such that the Chinese-government entity would regain the share of U.S. imports from China that it had during the period of investigation.

- b. In response to China's argument that "there is nothing magical about the 1% cut-off", could the United States please explain what criterion it used to set 1% as the cut-off? Could the United States please provide economic evidence supporting the 1% share as the cut-off?**

Response:

142. China suggests that there is a critical initial market share threshold below which the Armington model's predictions become systematically downwardly biased. However, there is no literature that demonstrates China's suggestion.

143. The one-percent threshold is a reasonable determination of the point at which observed import values are sufficiently greater than zero to reveal underlying relative competitiveness given the prevailing conditions in the market. The formula-based approach is a reasonable way to estimate nullification or impairment when there is not sufficient information to use an Armington model.

144. Consider, if the threshold were set at five percent, nullification or impairment in *Carrier Bags* would also use the formula-based approach. The Armington model predicts that a change in the duty rate from 77.57 percent to the 17.30 percent separate rate would have resulted in an increase in 2017 imports from the China-government entity of \$0.8 million, from \$0.7 million to \$1.4 million. The United States contends this estimated increase in exports value is a reasonable expectation for a market outcome under the counterfactual, lower duty rates, given limits on U.S. demand for carrier bag imports from China and on the ability of firms in the China government-entity to increase production and shift between export markets in response to a price change. These constraints are accounted for in the Armington model.

- c. In reference to the additional four cases listed in paragraph 165 of the China's written submission, could the United States please explain why the level of nullification or impairment for these cases is not estimated using the formula-based approach?**

Response:

145. The United States calculates imports from China under the China-government entity rate as a share of total U.S. imports from China under an antidumping duty order and uses a 1 percent threshold as a reasonable metric for evaluating whether there is sufficient information to use an Armington model. The four cases listed in paragraph 165 of China's written submission satisfy this criteria for applying the Armington model.

146. The Armington model, like all other standard trade models, relies on the observed value of imports as a share of the market to characterize an entity's relative competitiveness, given the conditions in the market, including the imposition of duties. Technically, the standard Armington model can be used as long as there are some imports. The Armington model, however, experiences technical difficulties when there are zero imports. In this case, the

Armington model will not predict changes in trade on the extensive margins,¹¹⁸ regardless of the size of the shock.

147. The United States uses the one-percent threshold to determine whether actual import flows from subject China are large enough relative to actual imports from non-subject China to serve as a basis for an understanding of the China-government entity's relative competitiveness given the antidumping duties in place. Comparing imports under the China-government entity rate to those of other firms from the same origin country, which also face relatively higher duties than external competitors, provides a better understanding of how close to zero the China-government entity's shipments are and whether the Armington method should be applied. Thus, the one-percent threshold provides the United States with the ability to evaluate the magnitude of trade flows for a particular product and to compare it with trade flows of the same product that is subject to WTO-consistent antidumping duties.

39. In *US – Washing Machines (Article 22.6 – US)*, the arbitrator calculated a trade figure for 2017 that "accounts for the depressing effect of the WTO-inconsistent duties applies in 2012 on Korea's share of the United States' LRW market".

a. To the United States: Please explain whether a similar two-step approach is feasible with its four market Armington-based model, and how it would be implemented.

Response:

148. A similar two-step approach is not technically feasible with the four market Armington-based model and, more importantly, such an approach would be incorrect on a conceptual basis. The conceptual error in the approach taken by the arbitrator in *US – Washing Machines (Article 22.6 – US)* is the arbitrator's (and Korea's) definition of the baseline for the calculation of the level of nullification or impairment. The level of nullification or impairment should have been calculated as the value of removing the duties in the period after the finding of non-compliance, not some adjusted historical period.

149. In this proceeding, a main technical difficulty here that was not present in *US – Washing Machines (Article 22.6 – US)* is that, in that arbitration, there was only one tariff rate that could be applied to all imports. In this proceeding, there are multiple tariff rates broken out by company for separate rates, and one tariff rate for the China-government entity rate. Also, the relevant market shares of Chinese companies prior to the imposition of the antidumping duties at issue in this proceeding are not known.

¹¹⁸ See Felbermayr, Gabriel and Kohler, Wilhelm, *Exploring the Intensive and Extensive Margins of World Trade*, Review of World Economics, Vol. 142, Issue 4, December 2006 (noting that "World trade evolves at two margins. Where a bilateral trading relationship already exists it may increase through time (intensive margin). But trade may also increase if a trading bilateral relationship is newly established between countries that have not traded with each other in the past (extensive margin)."), pp. 642-674.

150. That being said, the following data would be needed to implement the two-step approach that was used in *US – Washing Machines (Article 22.6 – US)*:

- Market share data by individual companies (or groups of companies) for the period right before both the WTO-consistent and WTO-inconsistent duties were imposed. These data are not available.
- Model parameters. These data are available from the USITC.
- Value of expenditures on all varieties (domestic U.S., rest of world, Subject China, Non-Subject China) for the contemporary reference period. These data are available for HTS categories.

151. To implement the two-step approach, the first step would be to calculate shares resulting from imposition of the antidumping duty. The second step would be to use share data from the first step, Subject China expenditure data for the contemporary reference period, and model parameters to calculate the level of nullification or impairment.

- b. To the United States: Please provide the following data for the year prior to the anti-dumping order and the first year in which the anti-dumping duties were imposed for the purpose of calculating the market shares of: (1) domestic sales, (2) imports from the exporters or producers in the PRC-wide entity in China, (3) imports from other exporters or producers in China, and (4) imports from other countries.**

If possible, please submit the data for the Chinese exporters or producers within the PRC-wide entity and those outside that entity, on a company-specific as well as aggregated basis. The data on domestic sales and imports from other countries may be submitted on an aggregated basis.

Response:

152. The United States does not have company-specific import information for the year prior to the imposition of the antidumping duties at issue in this proceeding. The United States, however, has provided data on U.S. domestic shipments, U.S. imports from China, the world, and the rest of the world for the year prior to the antidumping order, the year of the order, and 2017.¹¹⁹

- c. To the United States: Please explain whether the formula-based approach would still be relevant if this two-step approach is available.**

Response:

153. If the Arbitrator is asking whether the formula-based approach should be discarded if the two-step approach were available, the answer is no. The formula-based approach still would be

¹¹⁹ See Exhibit USA-57 and Exhibit USA-58.

relevant, and approaches similar to the formula-based approach have been used in previous Article 22.6 proceedings. As explained in the U.S. response to subpart (a) of this question, the two-step approach is not feasible.

154. The two-step approach is not consistent with economic theory and is not correct on a conceptual basis. As explained in the U.S. response to subpart (a) of this question, the conceptual error in the approach taken by the arbitrator in *US – Washing Machines (Article 22.6 – US)* is the arbitrator's (and Korea's) definition of the baseline for the calculation of nullification or impairment. The level of nullification or impairment should have been calculated as the value of removing the duties in the period after the finding of non-compliance, not some adjusted historical period. Correctly defining the baseline is essential to an appropriate estimation of nullification or impairment.

3.2.3 Formula-based Approach

40. To the United States: Could the United States please explain why in its formula-based approach, the level of nullification or impairment is not the difference between the counterfactual trade value and the actual level of trade?

Response:

155. The United States made a calculation error in its written submission. As pointed out in the Arbitrator's question, the level of nullification or impairment under the formula-based approach should be the difference between the counterfactual trade value and the actual level of trade. In the U.S. written submission, however, the United States did not subtract Chinese current imports from the counterfactual trade value, and thus the U.S. written submission incorrectly represents that the level of nullification or impairment is \$258.0 million. After adjusting for the calculation error, the level of nullification or impairment using the formula-based approach is \$256.7 million.¹²⁰

41. To the United States: The Arbitrator understands that, under the formula-based approach, the United States applies the PRC-wide entity's share in the total value of US imports from China during the period of investigation in the underlying investigation to the total value of US imports from China in 2017. Could the United States please clarify:

a. How it calculates the "Maximum Share Covered by PRC-Wide Entity during Period of Investigation"? Is this maximum share relative to total US market or relative to US imports from China?

Response:

156. To calculate the maximum share covered by the China-government entity during the period of investigation, the USDOC relied on data queried from the U.S. International Trade

¹²⁰ See Exhibit USA-53.

Commission's Dataweb and the HTS categories published in the public Fact Sheets accompanying the USDOC's final determinations in the investigations.

157. Using this data, the USDOC calculated the maximum China-government entity trade share, relative to U.S. imports from China under the relevant HTS categories, by aggregating the monthly import value in U.S. dollars for each HTS category in the Fact Sheet during the six-month period of investigation and the trade shares (in percentages) for the cooperating mandatory respondents, the non-cooperating mandatory respondents, and the separate rate respondents.¹²¹ The USDOC then subtracted the total trade shares for the cooperating mandatory respondents, plus the non-cooperating mandatory respondents, plus the separate rate respondents, from 100 percent to determine the maximum share covered by the China-government entity.

158. The maximum share covered by the China-government entity during the period of investigation is relative to the value of U.S. imports from China, not total U.S. imports. As explained further in the U.S. response to the next subpart of this question, this makes sense because this is the share unaffected (during the period of investigation) by the measure found to be WTO-inconsistent. The correct counterfactual assumes that this share would be restored to China in 2017, and the formula approach estimates the 2017 value of this share.

- b. Why is this share applied to the "total value of imports of the goods from China in 2017", and not the total US imports or total US market for the specific product under the anti-dumping order?**

Response:

159. The United States refers the Arbitrator to the U.S. response to question 38(a).

- c. How does the United States calculate the "Applicable Share Covered by WTO Determination" found in the table provided before paragraph 98 of the United States' written submission? Is this an average share or the average for a specific year?**

Response:

160. To explain the U.S. calculation of the Applicable Share Covered by the WTO Determination, the United States first sets the context for that calculation. The maximum share covered by the China-government entity includes merchandise from producers and/or exporters which the United States has labeled in this arbitration as Group 3 and firms the United States has labeled in this arbitration as Group 4. We also recall that only merchandise from firms the United States has labeled as Group 4 are appropriately the basis of the nullification and impairment calculation. Because Group 3 firms have in some way not cooperated with the USDOC's request for information, a rate based on facts available could have applied to them even if they were not part of the China-government entity. Therefore, the USDOC's applicable Share Covered by the WTO Determination calculation seeks to isolate the trade—based on the

¹²¹ See Exhibits USA-54 and USA-55.

information available—by Group 4 producers and exporters for the purposes of determining the level of nullification or impairment flowing from the DSB’s findings concerning the Singe Rate Presumption. The percentage resulting from this calculation represents the Group 4 trade.

161. The Applicable Share Covered by WTO Determination is neither an average share nor an average for a specific year. To calculate the Applicable Share Covered by WTO Determination in the table preceding paragraph 98 of the U.S. written submission, the United States started with its calculation of the maximum share covered by the China-government entity, as described above in the U.S. response to question 41(a).

162. Following the calculation of the maximum share covered by the China-government entity, relying on information in USDOC’s preliminary determinations in the relevant investigations or the relevant memorandum explaining its decision to limit individual examination (*i.e.*, “respondent selection memorandum”), as relevant, the United States then calculated a rate of non-response by known potential producers and/or exporters of subject merchandise from which the USDOC requested quantity and value information.

163. To calculate a non-response rate for this proceeding, the United States divided the number of known potential producers and/or exporters of the merchandise under investigation that did not respond (or timely respond) to the USDOC’s request for quantity and value information by the number of Quantity & Value questionnaires (or similar requests for information for quantity and value information) issued to known potential producers and/or exporters of the merchandise under investigation.

164. Companies that were issued a request for Quantity & Value information but did not respond to the USDOC’s request did not cooperate and, also, generally were treated as part of the China-government entity, thereby falling into what the United States has labeled as Group 3 in this proceeding.

165. Finally, to arrive at the Applicable Share Covered WTO determination (*i.e.*, the proportion of trade from Group 4 companies: producers or exporters that were part of the China-government entity and did not fail to cooperate with USDOC’s investigation), the United States reduced the maximum share of trade covered by the China-government entity by multiplying that figure by one minus the non-response rate.

42. To the United States: Please respond to the following with regard to China's argument that the United States' formula-based approach is "a very close cousin" to the approach adopted by China.

- a. How does the United States respond to China's argument that it is not logically possible for the United States to argue that China's DID approach to calculate the level of nullification or impairment is unreasonable when the United States' formula-based approach adopts a very similar conceptual approach ?**

Response:

166. China’s argument is baseless. The formula-based approach is not similar to DID tabular analysis and, contrary to China’s assertions,¹²² it is not subject to the same requirements as DID analysis in order to provide unbiased estimates.

167. The U.S. formula-based approach is appropriate for the specified antidumping duty orders in light of the facts. Consistent with the counterfactual, the formula-based approach applies the market share for a specific category of Chinese imports from the period of investigation of the antidumping investigation to total U.S. imports from China subject to U.S. antidumping duties in 2017. As explained in the U.S. written submission,¹²³ the formula-based approach is consistent with the approach taken by previous arbitrators in Article 22.6 proceedings.

168. In contrast, the conceptual idea underlying DID analysis is to assume that the observed trend in imports followed by an outside group of importers also would have been followed by China “but for” antidumping duties. The requirements for making this assumption (*i.e.*, parallel trends, stability, and uniformity), which are demanding, are not met by China in this proceeding.

169. The DID (tabular or regression) method can be correctly applied in certain scenarios, for example, in scientific experiments to determine the effectiveness of a new drug.¹²⁴ In such a scenario, the treatment (new drug) is randomly assigned to a large group of subjects with one group (treatment) receiving the drug and the other group (control) receiving a placebo. A comparison of the difference (if any) between the results of the two groups (treatment and control) is used to determine the effectiveness of the new drug. If there is no difference in outcomes between the two groups after the experiment, the new drug is determined to be ineffective.

170. DID analysis is not appropriate for this proceeding because the numerous facts related to the antidumping duty orders at issue here are inconsistent with those required for economic policy to be treated as a randomized controlled experiment. This is particularly problematic because antidumping duties were applied to firms whose exports to the United States were increased by conditions that allowed them to sell at less than fair value in the United States. These conditions are not represented in the DID tabular model. This link between pre-duty import levels and the imposition of antidumping duties through a third factor that is not included in the DID tabular model is a significant source of bias in China’s DID estimates.¹²⁵

b. Could the United States please elaborate and provide evidence on the relevance of the parallel trends, stability and uniformity assumptions in the context of its formula-based approach?

¹²² China’s Written Submission, para. 5.

¹²³ U.S. Written Submission, paras. 88-90.

¹²⁴ See *e.g.*, *Difference-in-Difference Method in Comparative Effectiveness Research: Utility with Unbalanced Groups*, Huanxue Zhou, Christopher Taber, Steve Arcona, and Yunfeng Li, *Appl. Health Econ Health Policy*, July 2016, available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4937082/>.

¹²⁵ See Besley (Exhibit USA-34). See also, Bertrand (Exhibit USA-35).

Response:

171. The parallel trends, stability, and uniformity assumptions are specific to the DID methodology and are thus irrelevant to the U.S. formula-based approach. The practical purpose of these requirements in DID analysis is to ensure that the measured effect of antidumping duties is isolated from everything else that may cause trends in imports from China to depart from those of a comparison group. The U.S. formula-based approach does not rely on a comparison between imports from China and any other importing country (or any control group) and therefore is not dependent upon the parallel trends, stability, or uniformity assumptions to provide unbiased estimates.

172. More specifically, under the parallel trends requirement in DID analysis it must be reasonable to assume that the selected comparison group is composed of exports that would be expected to follow the same trends as China's exports of the subject products in the absence of antidumping duties.¹²⁶ The calculations in the formula approach do not involve an external comparison group, so it is unreasonable to suggest that it must satisfy this assumption.

173. Under the uniformity requirement in DID analysis, it must be reasonable to assume that the antidumping duties are applied consistently to all exports in the treatment and control groups, respectively. The formula approach does not involve an external comparison group, so it is unreasonable to suggest, as China does,¹²⁷ that it must satisfy this assumption with respect to a control group. Moreover, the uniformity assumption is irrelevant to the calculation of the formula approach because changes in the China-government entity rate over time are irrelevant to the China-government entity's market share during the period of investigation.

174. Under the stability requirement in DID analysis, the treated and comparison exports must remain the same over time. The value of imports from China used in the formula-based approach correspond to the product description as defined by the antidumping duty order. Unlike the reference HTS codes, this description does not evolve over time. Furthermore, whether or not the number of firms that comprise the China-government entity expands over time is also irrelevant.

43. To the United States: China contends that the United States' implementation of the formula-based approach contains "mathematical mistakes" that imply no net gain to China since the formula-based approach "computes N/I for the PRC-wide entity firms by taking trade volume (and value) away from other PRC firms". Could the United States please respond to China's argument?

Response:

175. The U.S. formula-based calculation of nullification or impairment does not take trade volume or value away from firms that did not receive the China-government entity rate. Rather, the formula-based approach takes the import share of the U.S. market for all companies assigned

¹²⁶ See U.S. Written Submission, para. 129. See also, Angrist and Pischke (2008) (Chapter 5.2) (Exhibit USA-23).

¹²⁷ China's Written Submission, para. 103.

the China-government entity rate prior to the imposition of the WTO-inconsistent antidumping duty measures and applies that market share to the total value of U.S. imports from China subject to U.S. antidumping duties in 2017. The result is the estimated value of imports from firms subject to the China-government entity rate under the counterfactual. The corresponding U.S. estimate of nullification or impairment implicitly assumes that the total value of imports from China in 2017 is the sum of this counterfactual value and the observed value of imports from all firms not subject to the China-government entity rate. This implies a net gain to China in the amount of the nullification or impairment as calculated using the formula-based approach.

176. The United States uses the maximum share of imports that may have been assigned the China-government entity rate during the period of investigation (either Group 4 firms alone, or Group 3 and Group 4 firms combined). The determination in using either Group 4 alone, or Group 3 and Group 4 combined, depends on data availability. As explained in the U.S. written submission, this method almost certainly overstates the level of nullification or impairment, as it is unlikely that Group 4 firms that were assigned the China-government entity rate, or a high separate rate, would retain the same market share they had during the period of investigation because other companies would have received lower duty rates and would be at a competitive advantage.¹²⁸ Combining Group 3 and Group 4 companies also overstates the level of nullification or impairment since the WTO-inconsistent measure only applies to Group 4 firms.

177. The formula-based approach does not imply that the China-government entity's share of U.S. imports from China is held constant between the period of investigation and 2017. This is because the observed value of imports from the China-government entity in 2017 is less than the counterfactual value.

44. To the United States: China argues that:

[E]ven if the U.S. formula did not contain a mathematical mistake the N/I estimate produced using the formula would be biased downward because the United States formula simply scales the 2017 trade value. The fact that the imposition of the WTO inconsistent tariffs has driven imports from China to near zero in each of these cases is exploited by the formula proposed by the United States.

Could the United States please respond to China's argument?

Response:

178. It is reasonable to use a formula-based approach that scales observed 2017 trade. In all antidumping duty orders to which the formula-based approach is applied, less than one percent of the observed value imports was subject to WTO-inconsistent duties. As explained in the U.S. written submission,¹²⁹ the formula-based approach is only applied to antidumping duty orders where the China-government entity's share of total imports from China is less than one

¹²⁸ U.S. Written Submission, para. 45.

¹²⁹ U.S. Written Submission, paras. 87-98.

percent.¹³⁰ That is not the case for most antidumping duty orders at issue. Thus, China’s assertion that WTO-inconsistent antidumping duties have driven imports to near zero is a mischaracterization of the facts.

179. Shifting the China-government entity rate to a lower separate rate would lead to some increase in U.S. imports by these companies, but will ultimately be constrained by imports in 2017 from other China companies that generally have lower WTO-consistent duty rates (typically lower than even the separate rate). Furthermore, in taking the pre-duty share of those companies assigned the China-government entity rate, and applying it to 2017 data, the United States assumes that competitive conditions for these specific companies have not changed and that they follow the same competitive structure as those imports from other Chinese companies with WTO-consistent antidumping duty rates.

180. Additionally, U.S. formula-based estimates of nullification or impairment for CSPV cells and off-the-road tires over-estimate the value of trade that corresponds to the market share of firms subject to duties that have been found WTO-inconsistent. For these two products, the market share is over-estimated because the United States cannot separately identify firms in Group 3 and Group 4.

3.2.4. Parameters in the Armington-based Model

45. To the United States: China argues that the Armington-based model used by the United States for 17 cases requires a large number of modelling assumptions and that for many elasticity parameters the United States "appears to have arbitrarily assigned values". In response to China's argument, could the United States please provide supporting evidence, such as references to academic literature or econometric studies, to justify the values assigned to the elasticity parameters in the Armington-based model?

Response:

181. The United States did not “arbitrarily” assign values to the elasticities. Rather, the United States based the elasticity values on the most reliable information available, which is collected by the USITC in antidumping and countervailing duty (AD/CVD) investigations.

182. The United States is not aware of any academic literature or econometric studies that focus on the specific products at issue in this proceeding. However, there is economic analysis available for these specific products from the USITC AD/CVD investigations (*see* Exhibits USA-16 and USA-17). The reports from the USITC’s AD/CVD investigations include elasticity estimates based on confidential questionnaire responses from firms directly involved in the markets for the specific products at issue in an AD/CVD investigation, as well as other information provided by petitioners and respondents in an AD/CVD investigation.

¹³⁰ *See* Exhibit USA-30.

183. The elasticity estimates used by the United States reflect the most reliable information available. The USITC, an independent federal agency, investigates the effects of dumped and subsidized imports on U.S. domestic industries and serves as a federal resource where trade data is gathered and analyzed. The USITC's elasticity estimates are not created on behalf of the United States for purposes of WTO dispute settlement. Rather, the USITC has been estimating elasticities for AD/CVD investigations since the late 1980s. Both petitioners and respondents in an AD/CVD investigation have opportunities to comment on the elasticity estimates, which they often do, and the USITC incorporates these comments into its final report.

184. The USITC elasticity estimates are the specific parameter inputs needed to calibrate the Armington-based model. In other words, the United States used the elasticity estimates to tailor the model to the market for the specific product. Given the public availability of the elasticities, the Armington-based model is the best way to quantify the impact of import duties on the volume of international trade

46. To the United States: In the Armington-based model, the United States uses 10 as the import supply elasticities for (1) PRC-wide entity (ϵ_s), (2) other imports from China (ϵ_{nc}), and (3) all other foreign sources (ϵ_{row}), and uses a midpoint in a range of supply elasticities published by the USITC as the elasticity of domestic supply (ϵ_d).

a. Could the United States please explain the rationale for using different supply elasticities for importers and domestic suppliers?

Response:

185. The United States applied an estimate of 10 for the import supply elasticity and the midpoint of the domestic supply elasticities estimated by the USITC, which are uniformly less than 10. This reflects the fact that import supply is generally more price-elastic than the supply of domestic shipments because the volume supplied can be adjusted in several different ways: the exports of the foreign producers can be diverted to or from other national markets, and the foreign producers can also adjust their total production levels.

186. The nullification or impairment estimates are not especially sensitive to the level of the import supply elasticity. The United States could assume, as a sensitivity analysis, that the import supply elasticities have the same value as the U.S. domestic supply elasticity. This adjustment to the model would result in a lower estimate of nullification or impairment for all of the antidumping duty orders at issue in this proceeding in which the United States used the Armington-based approach: \$11.9 million compared to \$24.1 million. Exhibit USA-USA 52 presents the modeling results with import supply elasticities that are the same as U.S. domestic supply elasticity.

b. Could the United States please explain the methodology it used to estimate the import supply elasticities? Could the United States please explain why such import supply elasticities are assigned the same value of 10 for all imports across all products?

Response:

187. The United States applied an estimate of 10 for this parameter to show that the import supply elasticity is more elastic than the U.S. domestic supply elasticity, as is typically done by economists, including the economists at the USITC.¹³¹ It is common practice in applied economic modeling to make judgments for the value of parameters for which formal estimates are not available when those parameters are not central to the analysis. A value of 10 is a common choice to represent a high degree of supply elasticity.¹³² Gasiorek (2019)¹³³ assumes a foreign supply elasticity of 15 in an Armington-based partial equilibrium model.

188. The United States also could have fixed these import supply elasticities at the same level as the U.S. domestic supply elasticity (as estimated by the USITC; this was the approach taken by the arbitrator in the *US – Washing Machines* Article 22.6 proceeding). Fixing the same supply elasticity to both domestic and import sources would result in a lower estimate of nullification or impairment (as noted in the U.S. response to subpart (a) of this question).

- c. Could the United States please respond to China's argument that "the United States does not provide a single citation to any academic literature justifying the assertion that all types of foreign suppliers for all products have the exact same supply elasticity" and "[r]ather ... simply asserts 'common technique in the literature'" ?**

Response:

189. It is a common practice in applied economic modeling to make the simplifying assumption that import supply elasticities are constant across products. Gasiorek (2019), for instance, assumes a foreign supply elasticity of 15 in an Armington-based partial equilibrium model for each firm in a given industry.¹³⁴

190. While the United States uses elasticity estimates for the particular products covered by the antidumping orders at issue, it is not uncommon to assume a constant value for the domestic supply elasticity that is based on an estimate from the economics literature. These estimates, though, generally are based on broad categories of products.¹³⁵ Thus, it is reasonable to assume that the USITC's domestic supply elasticity estimates are appropriate for this proceeding.

¹³¹ See, e.g., Hallren and Riker (Exhibit USA-15); U.S. International Trade Commission, Investigation No. TA-201-73, *Steel*, Publication 3479, December 2001, Appendix G: Technical Appendix on General Equilibrium in Safeguard Measures, (Exhibit USA-59); Leith, J., et al., *Indonesia Rice Tariff*, Poverty and Social Impact Analysis, March 2003, (Exhibit USA-62).

¹³² *Id.*

¹³³ Gasiorek, M., et al., (noting that authors "assume a high but finite supply elasticity," which is higher for foreign than domestic suppliers), *Which Manufacturing Industries and Sectors are Most Vulnerable to Brexit?*, The World Economy, (2019), (Exhibit USA-63).

¹³⁴ *Id.*

¹³⁵ *Id.*

191. Moreover, China has not provided to the Arbitrator any alternative source, such as academic literature, for information concerning the price responsiveness of the specific products at issue.

d. Could the United States please explain the methodology the USITC used to estimate the range of domestic supply elasticities listed in Exhibit USA-16?

Response:

192. In its reports, the USITC explains that the elasticity estimates are based on confidential questionnaire responses from firms directly involved in the markets for the specific products at issue, as well as evidence, testimony, and other information provided by petitioners and respondents during the course of an AD/CVD investigation.

193. Supply elasticities are set based on industry specific, and sometimes qualitative, information about capacity constraints, production responsiveness, etc. Zero indicates that the market is capacity constrained, infinite means firms can increase supply at the going market price, and a positive number reflects a situation where increased production requires a higher market price.

194. The United States refers the Arbitrator to the discussion of elasticities in the USITC investigation reports included in Exhibit USA-17. As explained in the U.S. response to question 45, the USITC has extensive experience in estimating trade elasticities.¹³⁶

e. Could the United States please provide any reference to academic literature to support the choice of import and domestic supply elasticities?

Response:

195. After extensive research, the United States has not been able to find academic literature addressing price responsiveness of domestic and import supply of the specific products at issue in this proceeding. As explained above, the United States has utilized the USITC elasticity values because they are the most accurate and reliable information available for the products at issue.

196. In Computable General Equilibrium (CGE) modelling, in the context of single market, for multiple source country models (like the U.S. model in this proceeding), the domestic and export supply are typically treated in a reduced form way with a shape parameter to calibrate the equation to the initial equilibrium and a general supply elasticity that captures how responsive country export supply is to a change in the market price in the buyer's market. (Hillberry and Hummels, 2013)¹³⁷.

¹³⁶ See also, U.S. International Trade Commission, *High Pressure Steel Cylinders from China*, Investigation No. 701-TA-480 and 731-TA-1188, 2012), pp. II-2-II-3, II-4-II-7 and substitution factors, and II-7-II-11. Exhibit USA-64.

¹³⁷ Exhibit USA-36.

197. One example is the USITC's USAGE model, a highly disaggregated, single market model for the United States market. The model incorporates, for some products, positive elasticities of import supply to reflect the idea that the U.S. market is large enough to affect the import price. (Dixon and Rimmer, 2009)¹³⁸ While the export supply equation may be reduced form, the elasticity is derived based on an understanding of how smoothly production inputs can flow into an industry of interest. (Horridge, 2014)¹³⁹

47. To the United States: Could the United States please explain the methodology the USITC used to estimate the range of demand elasticities in Exhibit USA-16? Could the United States please provide any reference to academic literature to support the choice of the demand elasticities?

Response:

198. The United States adopted the mid-point of the range of estimates in the reports from the USITC investigations of these products. As explained above, the USITC elasticity estimates are based on confidential questionnaire responses from firms directly involved in the markets for the specific products at issue, as well as evidence, testimony, and other information provided by petitioners and respondents during the course of an AD/CVD investigation.

199. Again, the United States refers the Arbitrator to the discussion of elasticities in the USITC investigation reports included in Exhibit USA-17.

200. Finally, as explained above, the United States has not been able to find academic literature addressing the price responsiveness of domestic and import supply of the specific products at issue in this proceeding.

48. To the United States: With reference to the range of elasticities of substitution listed in Exhibit USA-16:

a. Could the United States please explain the methodology the USITC used to determine the range of elasticities of substitution?

Response:

201. As explained above, the USITC elasticity estimates are based on confidential questionnaire responses from firms directly involved in the markets for the specific products at issue, as well as evidence, testimony, and other information provided by petitioners and respondents during the course of an AD/CVD investigation. The USITC discusses the information that it examined and its economic analysis in its reports presenting the final determinations in AD/CVD proceedings.¹⁴⁰

¹³⁸ Exhibit USA-38.

¹³⁹ Exhibit USA-37.

¹⁴⁰ For example, substitutability issues in the *Steel Cylinder* report are presented in pp II-7-II-9. (Exhibit USA-64).

b. Does the United States have empirical evidence to support the choice of elasticities of substitution?

Response:

202. The United States has not undertaken a new econometric analysis of the elasticities of substitution. Support for the choice of elasticities of substitution can be found in the USITC reports.

c. How do the values assigned to the elasticities of substitution compare with estimates available in the literature, such as in Broda and Weinstein (2006)?

Response:

203. The elasticities of substitution that the United States proposes are estimates made by the USITC after analyzing responses from purchasers, producers, and importers to questionnaires concerning the specific product and market, as well as arguments made by interested parties in an AD or CVD investigation. Because these elasticities are for the specific product at issue in this proceeding, it is more reasonable to use the USITC elasticities than it would be to use the elasticities generated in the academic literature.

204. The United States would note that literature estimates for aggregated product groups, such as in Broda and Weinstein, are lower than the elasticity estimates from the USITC. Using elasticities generated by Broad and Weinstein would lower the estimated level of nullification or impairment.

205. Broda and Weinstein (2006) is one of several papers in the academic literature following the methods proposed in Feenstra (1994),¹⁴¹ and Feenstra (2018).¹⁴² The academic elasticities are estimated without using any data on tariffs or trade barriers, and these elasticity estimates are lower than trade elasticities estimated based on variation in tariff rates.

206. In the two main surveys of the academic literature, Hilberry and Hummels (2013) recommend a substitution elasticity of 5 and Head and Meyer (2014)¹⁴³ recommend a trade elasticity of 5 (implying a substitution elasticity of 6). The Feenstra-based methods have median import-import elasticity estimates of 1.86 to 4.05.

Table VIII Recent estimates of import-import elasticities following Feenstra (1994)

¹⁴¹ Robert C. Feenstra, *New Product Varieties and the Measurement of International Prices*, American Economic Review, Vol. 84, No. pp. 157, 1994 (Exhibit USA-70).

¹⁴² Robert C. Feenstra, et al, *In Search of the Armington Elasticity*, Review of Economics and Statistics, 100(1):135-150 (March 2018) (Exhibit USA-71).

¹⁴³ Keith Head and Thierry Mayer, *Gravity Equations: Workhorse, Toolkit, and Cookbook*, CEPII Working Paper, (Exhibit USA-72).

Study	Level of disaggregation (number of products included)	Median estimate	Estimation technique
Broda and Weinstein (2006)	SITC-3 (256 products)	2.2	GMM/Grid search
	10-digit (13,972 products)	3.1	GMM/Grid search
Feenstra et al. (2018)	10-digit (98 products)	4.05	2-step GMM

3.2.5 Calculation

49. **To the United States: The United States indicates that the total level of nullification or impairment should be \$277.2 million. The Arbitrator notes, however, that the total estimated level of nullification or impairment appears to add up to \$277.75 million (\$19.72 million from the Armington-based model , \$258.0 million from the formula-based approach , and \$0.03 million from the USDOC's use of the WA-T methodology (with zeroing)). Could the United States please confirm the correct amount of the estimated level of nullification or impairment?**

Response:

207. The Arbitrator’s observation is correct. In the U.S. written submission, the correct level of nullification or impairment adds up to \$277.75 million. As the United States has explained in the U.S. responses to other questions, the United States updated its data after it submitted the U.S. written submission. Using updated data, the estimated level of nullification or impairment is \$200.790 million.

208. This new estimate incorporates additional information regarding: (1) minor revisions to CBP data that affects both the Armington-based approach and the formula-based approach; (2) additional data further separating Group 3 imports from Group 4 imports for three products under the formula-based approach; (3) corrections of some parameter estimates in Armington modeling runs that were included in the U.S. written submission; (4) deductions for existing 2017 U.S. imports under the formula-based approach; and (5) the incorporation of *Wooden Bedroom Furniture* into the formula-based approach.

209. Thus, the total the U.S. estimate of the level of nullification or impairment is as follows:

- Armington-based Approach (17 products plus N/I estimate for zeroing): \$24.057 million
- Formula-based Approach (5 products): \$176.733 million
- AD Rate-based approach (2 products): \$0
- Total: \$200.790 million

210. The U.S. estimate is methodologically sound and reasonable. The U.S. approach results in an estimated increase in total U.S. imports from China of 14 percent over actual, observed 2017 U.S. imports, as correctly determined by CBP. This contrasts with China's estimate of the level of nullification or impairment, which represents an increase in total U.S. imports from China of 480 percent over observed 2017 U.S. imports (using HTS categories that China incorrectly identified) and 1,044 percent over observed 2017 U.S. imports (using Customs import data, which actually reports the U.S. imports of the specified product from China).