

Issues on Particular Market Situation to Calculate Dumping Margin of Korean Steel Products by the USA

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Abstract

Purpose – The U.S. Trade Preference Expansion Act (TPEA) of 2015 enables the US Department of Commerce (DOC) to inflate dumping margin when the particular market situation (PMS) exists in the exporter's home market. DOC applied PMS provisions to the steel products from Korea. This paper analyzes whether DOC's calculation by using the regression analysis is consistent with WTO rules.

Design/methodology – This paper analyzes the PMS application in law and regression analysis that extends the data period from 10 years to 18 years using the same economic model with DOC, and changes the country group according to the quantities of steelmaking capacity.

Findings – Results show that DOC's argument conflating the sales-based with cost-based PMS designed to inflate dumping margins might not be consistent with WTO Antidumping Agreement Article 2.2 and 2.2.1.1 in which costs shall normally be calculated on the basis of records kept by the exporter, providing generally accepted accounting principles and reasonably reflection of the costs and PMS that exists in the Korean steel product markets. Even if it will be consistent, DOC's calculated margin by the regression analysis using a 10-year data is a big gap (5 times) compared with an 18-year data projection and different countries' data through the same methodology, which is a huge gap of regression coefficient. It means that dumping margin would be very wide range from 7.8% to 38.54% and unstable to calculate. Inflating dumping margin by DOC using regression analysis would not only be inconsistent with WTO rules, but also projection result is unreliable.

Originality/value – Literature papers have mainly analyzed WTO law itself. This paper however, would be the first attempt to analyze the DOC's new way of dumping margin calculation in both manners of law and an empirical methodology perspective at the same time.

Keywords: Antidumping Agreement, Dumping Margin Calculation, Particular Market Situation (PMS), Regression Analysis, TPEA

JEL Classifications: D12, F14, O53

1. Introduction

The trade war, between the countries with two largest economies, the United States and China, is an ongoing escalating economic conflict. President Trump has begun setting high tariffs and other trade barriers against China, and many other countries blaming for unfair trade practices. Suffering from a growing trade deficit, Trump administration has advocated high tariffs to reduce the U.S. trade deficit and promote domestic manufacturing claiming that United States was being ripped off by its major trading partners such as China, Korea, and so on.

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Trump's America First economic and trade policy has threatened to overturn the decades of openness of trade and damage the liberal world trade order. Under the globalization and free trade, most Americans have been failures. Many of the manufacturing jobs have shifted to low-wage countries. Especially, the hollowing out of jobs in traditional major industries, like steel and automobile, is having a huge negative damage on the low-skilled workers and fueling trade protectionism. US Department of Commerce (DOC) has reinforced trade wars on multiple fronts through a series of new laws to operationalize Trump's America First trade strategy, not even sparing the most trusted U.S. allies, including Korea. Recently, U.S. TPEA (Trade Preference Extension Act) of 2015 could lead to increasing use of Particular Market Situation (PMS) which distorted the domestic costs of major inputs used in the production of a subject merchandise based on the normal value in calculating anti-dumping margin. The DOC was granted an expanded authority under the TPEA to deviate from foreign producers' reported home market sales prices or production costs as outside the ordinary course of trade when determining whether exports to the United States have been sold at dumped prices.

Unfortunately, the DOC applied PMS provisions to the import of the steel products from Korea and calculated huge dumping margin against the Korean oil country tubular goods (OCTG) by using the regression methodology for the first time. Korea's exporters challenged the DOC's decision of antidumping measures and margin calculation methodology before Court of International Trade (CIT), CIT ruled DOC to recalculate the dumping margin based on its change of prior decision without any additional factual findings. Despite CIT's decision, DOC would inflate dumping margin when the PMS exists in the exporter's home market, meaning that there might be a distortion in the production cost in their target countries' market.

The purpose of this paper is to analyze whether DOC's margin calculation by using the PMS rule to Korea's steel products is consistent with the WTO Antidumping Agreement, investigate whether DOC's dumping margin calculation of regression analysis methodology has robustness for regression model and check the stability of result by using different data and time period. This article is organized as follows. The second section reviews the literature, which researched about a series of antidumping and PMS related issues. The third section analyzes whether DOC's margin calculation is matched to US's TPEA, and WTO Antidumping Agreement. The fourth section verifies the DOC's regression analysis outcome by using the different data and countries. The fifth section presents the conclusions of this study.

2. Literature review

Chang Seung-Wha (2019) points out that dumping margin should increase if it is to be calculated on the basis of adjusted increased costs rather than the actual costs for the subject merchandise under investigation when comparing the normal value and export price. The U.S. TPEA of 2015 enabled the DOC to do so when PMS exists in the exporter's home market or where the normal value is calculated. DOC applied that PMS provisions to the import of the steel products from Korea and Korean steel companies filed a complaint with the CIT against the DOC's anti-dumping investigation and margin calculation. He argued that the DOC's application of PMS to Korean steel products, based on TPEA anti-dumping provisions caused artificial rise of dumping margin and violated WTO Anti-Dumping Agreement.

Chung Chan-Mo (2017) emphasizes President Trump's America First economic policy is making an impact on the application of trade remedy measures. When Donald Trump was inaugurated as president of the United States, the TPEA amended the Tariff Act of 1930. One of changes made by the amendment is widening the application of PMS which justifies disregarding cost and price information of the exporter or producer in the antidumping

investigation¹. This amendment allows DOC to take into consideration not only PMS directly related to the merchandise under condition but also a wide variety of economic factors including inputs, natural resources, and broader economic considerations, such as government involvement. The Administrative Review of the Antidumping Duty Order on Certain Oil Country Tubular Goods (OCTG) from Korea was decided on April 10, 2017 applied active application of the PMS provision after the amendment. The real intention of the US is to lay the groundwork for application of PMS provision to socialist economies such as China, it may incite a new wave of anti-dumping practices by countries that prefer anti-dumping. This, however, may be a step beyond the scope of the anti-dumping measures under Article 2.2 of the WTO Anti-Dumping Agreement and the second supplementary provision to GATT VI:1².

Ellis (2017) finds that although the DOC's authority to depart from a foreign producer's reported costs of production already existed prior to the TPEA's 2015 enactment, the DOC now has signaled its willingness to act on allegations of particular market situations. That willingness may invite similar allegations in the future. DOC's anti-dumping proceedings in which market distortions may exist. The specific conditions found in OCTG from Korea may end up being mere examples. Uncertainty will undoubtedly infect this topic until parameters are developed to define PMS whether on the part of the DOC itself, the reviewing courts or the WTO.

Jeong Hye-Seon (2018) argues that it is highly likely that the revised PMS-related provisions of the U.S. Tariff Act will be applied to market economies in the future like the dumping margin calculation applied to non-market economies all along, especially considering the distortion of production costs, and that it is highly likely that the US will apply a similar method to the dumping margin calculation applied to non-market economies by the judgment of the investigation authorities. It is more worrisome that it is highly likely that PMS will be applied to other items similar to the production structure, i.e. raw material procurement structure.

Kang Min-Ji (2018) emphasizes that as the discretion strengthened the probability that US trade remedy will be taken voluntarily, so the government of Korea needs to raise a strong claim against the damage of business, and the industry needs to minimize the damage thorough preparation for the U.S. anti-dumping investigation. He also argues that it is difficult to foresee the impact of the EU's application of critical distortions in Korea, a market economy, but it is necessary to prepare proactively, such as increasing the number of surveys initiated by investigations and paying attention to target surveys for specific industries.

Lee Jae-Min (2018) argues that the international interests in the PMS investigation techniques are rising in anti-dumping investigations, and that this is the so-called new dumping rate calculation method by combining PMS anti-dumping and countervailing duty investigations with each other. This new method of investigation is a great burden for Korean companies, and the recent DOC's judgment or actually applied section 504 of the U.S. TPEA to the production cost calculation in determining the constructed price is not consistent with the WTO Anti-Dumping Agreement. Meanwhile, the terms of the Anti-Dumping Agreement and the relevant jurisprudence of the WTO panels and the Appellate Body show that there are ways to introduce and apply PMS in a way in accordance to the relevant terms of the agreement. So it is necessary for Korea to consider a trade remedy system that is necessary to actively accept and utilize new research techniques within the limits consistent

¹ Trade Preference Expansion Act(TPEA) of 2015 section 5

² **Article VI** Anti-dumping and Countervailing Duties https://www.wto.org/english/res_e/booksp_e/gatt_ai_e/art6_e.pdf

with the trade agreement. This will complement the situation in Korea that has not yet conducted a countervailing duty investigation. In addition, the PMS survey method is also important in the nature of preliminary steps in preparing Korea for countervailing duty investigations. By considering this point, it is necessary to find a consensus plan for the WTO agreement of this system, reflect it in Korea's laws, and use it in the anti-dumping investigation process of the Trade Commission.

Yun Mik-Yung (2017) examines that the PMS provision of the WTO Anti-Dumping Agreement is increasingly invoked against what may be described as input-dumping, but this potentially violates the current Anti-Dumping Agreement rules. The practices and recent changes regarding the PMS provision in the US by critically examining relevant antidumping investigations in the US according to GATT/WTO jurisprudence. She finds that the recent legal changes in the US widens the scope and applicability of the PMS provision to cover input subsidies, allowing the US to use not only surrogate prices, but also surrogate costs. Furthermore, the required standard of evidence to find PMS seems to have reduced the frequency of use. A wide range use of the PMS provision in such an inconsistent way calls for a fundamental review of the current trade remedy rules of the WTO.

Zhou Wei-Huan and Percival (2016a) argues that one of the most controversial issues in the bilateral trade between China and Australia is the study of the PMS issue in anti-dumping investigations. As China's non-market economy status will expired on 11 December 2016, countries might want to resort to other alternative methods to counteract Chinese imports. The existence of a situation in a market, such as government interventions by ways of regulation or financial assistance constitute a PMS within the meaning of the Anti-Dumping Agreement. Rather, the PMS decision should be based on an assessment of comparability between domestic sale price and export price of the target products. Therefore, the investigation authorities argued that PMS does not exist if the distorted price does not prove to exist, and what is important about PMS is that it should promote free trade by prohibiting unjustified inflation of dumping margins and discouraging tit-for-tat abuse of PMS.

Zhou Wei-Huan and Percival (2016b) made a detailed study on the analysis of the WTO panel report on the EU-Biodiesel dispute which represents the latest development of the WTO jurisprudence on anti-dumping. Also, the panel correctly established that the finding of PMS does not provide a sufficient ground in the use of surrogate costs in the determination of constructed normal value and that the use of that methodology would result in the imposition of anti-dumping duties in excess of dumping margins that should have been established consistently with the WTO Anti-Dumping Agreement, that is, by using actual costs recorded by exporters under investigation. Both Australia's anti-dumping laws which essentially authorize the use of surrogate costs in the construction of normal value solely based on the finding of PMS and Australia's use of that methodology in practice are inconsistent with WTO rules, so the panel's decision is a positive step toward the resolution of the issues related to PMS by imposing constraints on the use of a protectionist methodology in determining 'constructed normal value' (CNV) so as to prevent unjustified inflation of dumping margins and anti-dumping duties.

Zhou Wei-Huan (2018) points out that China's special economic system has brought more and more challenges to the world trading system and attracts more and more academic and policy debates. WTO members often take antidumping measures when dealing with price distortions caused by Chinese government intervention in the economy. The Appellate Body's recent ruling in the EU-Biodiesel dispute begins to cancel the flexibility to condemn state intervention and price distortions under the WTO Anti-Dumping Agreement through anti-dumping measures. This decision, together with WTO's jurisprudence on "ordinary course of trade" test and subsidies, suggests that price distortions caused by state intervention

should be addressed in accordance with WTO rules. Therefore, it is necessary for WTO members to shift their focus to other rules and explore the ability of other rules to overcome the challenges arising from China’s state capitalism.

Table 1. Summary for PMS Studies

Papers	Authors	Issues
Debunking the myth of ‘Particular Market Situation’ in WTO Antidumping Law	Zhou and Percival (2016a)	<ul style="list-style-type: none"> • Government interventions or financial assistance in market does not constitute a PMS within the meaning of the Anti-Dumping Agreement • a determination of PMS must be based on the assessment of comparability between domestic sale price and export price • promotes free trade by prohibiting unjustified inflation of dumping margins and discouraging tit-for-tat abuse of PMS
The Use of ‘Particular Market Situation’ Provision and its Implications for Regulation of Antidumping	Yun (2017)	<ul style="list-style-type: none"> • legal change in the US widens the scope and applicability of the PMS provision (cover input subsidies)→ allowing the use of both surrogate prices and surrogate costs • the areas that have been judged to be subsidized, would be highly likely to add to their dumping margins • if the U.S. applies and operates the PMS rules extensively in such an abnormal manner, it is highly unlikely that it will comply with WTO anti-dumping rules
U.S. Department of Commerce Employs New “Particular Market Situation” Approach to Calculate Dumping Margins	Ellis (2017)	<ul style="list-style-type: none"> • the DOC now has signaled its willingness to act on allegations of “particular market situations” • this willingness may invite similar allegations in the future • specific conditions found in OCTG from Korea only has been seen as an example • Uncertainty will undoubtedly infect this topic until parameters are developed to define “particular market situations”
PMS Methodology in Antidumping Investigations- New Implications for Antidumping and Countervailing Duty Investigation Laws, Regulations and Practices of Korea	Lee (2018)	<ul style="list-style-type: none"> • PMS has become a controversial topic in the antidumping investigation, and this is called “new dumping rate calculation method” • the PMS methodology as applied by the United States in accordance with the new trade law (TPEA of 2015, section 504) constitutes a violation of the WTO Antidumping Agreement. • the provisions of the Anti-Dumping Agreement and the relevant jurisprudence of the WTO panel and the Appellate Body indicate that there are ways to introduce and apply PMS in a way consistent with relevant provisions of the agreement.
WTO Consistency of the PMS under the US TPEA: A Focus on the US Commerce Department’s Antidumping Duties on Steel Products from Korea	Chang (2019)	<ul style="list-style-type: none"> • DOC’s application of PMS to Korean steel products in accordance with the provisions of the anti-dumping laws based on TPEA that cause artificial rise of dumping margin violates WTO Anti-Dumping Agreement.

The difference between this study and other previous studies is whether or not the anti-dumping tariff imposition by DOC's methodology using PMS is consistent with the WTO anti-dumping agreement, and whether the calculation of the dumping margin using the DOC regression economic model is a reasonable way in an econometric approach.

3. Legal analysis

3.1. US PMS Legal Basis

In determining antidumping tariffs, DOC calculates the amount by which the normal value of subject merchandise exceeds the export price (or the constructed export price) for the merchandise.³ When reviewing antidumping duties in an administrative review, DOC must determine (i) the normal value and export price(or constructed export price) of each entry of the subject merchandise, and (ii) the dumping margin for each such entry.⁴ Normal value represents the price at which the subject merchandise is first sold in the exporting country.⁵ Export price is the price at which the subject merchandise is first sold(or agreed to be sold)in the United States.⁶

If DOC cannot determine the normal value of the subject merchandise based on home-market sales or third-country sales, then DOC uses a constructed value as a basis for normal value.⁷ Article subsection(e)⁸ governs the calculation of a constructed value. When calculating

³ 19 U.S.C. § 1673 <https://www.law.cornell.edu/uscode/text/19/1673>

⁴ 19 U.S.C. § 1675(a)(2)(A) <https://www.law.cornell.edu/uscode/text/19/1675>

⁵ 19 U.S.C. § 1677b(a) (1)(A), (B)(i) <https://www.law.cornell.edu/uscode/text/19/1677b>

⁶ 19 U.S.C. § 1677a(a) <https://www.law.cornell.edu/uscode/text/19/1677a>

⁷ 19 U.S.C. § 1677b(a) <https://www.law.cornell.edu/uscode/text/19/1677b>

⁸ 19 U.S.C. § 1677 Normal value **b(e)** Constructed value For purposes of this subtitle, the constructed value of imported merchandise shall be an amount equal to the sum of—

(1) the cost of materials and fabrication or other processing of any kind employed in producing the merchandise, during a period which would ordinarily permit the production of the merchandise in the ordinary course of trade;

(2) (A) the actual amounts incurred and realized by the specific exporter or producer being examined in the investigation or review for selling, general, and administrative expenses, and for profits, in connection with the production and sale of a foreign like product, in the ordinary course of trade, for consumption in the foreign country, or (B) if actual data are not available with respect to the amounts described in subparagraph (A), then—(i) the actual amounts incurred and realized by the specific exporter or producer being examined in the investigation or review for selling, general, and administrative expenses, and for profits, in connection with the production and sale, for consumption in the foreign country, of merchandise that is in the same general category of products as the subject merchandise,

(ii) the weighted average of the actual amounts incurred and realized by exporters or producers that are subject to the investigation or review (other than the exporter or producer described in clause (i)) for selling, general, and administrative expenses, and for profits, in connection with the production and sale of a foreign like product, in the ordinary course of trade, for consumption in the foreign country, or

(iii) the amounts incurred and realized for selling, general, and administrative expenses, and for profits, based on any other reasonable method, except that the amount allowed for profit may not exceed the amount normally realized by exporters or producers (other than the exporter or producer described in clause (i)) in connection with the sale, for consumption in the foreign country, of merchandise that is in the same general category of products as the subject merchandise; and

(3) the cost of all containers and coverings of whatever nature, and all other expenses incidental to placing the subject merchandise in condition packed ready for shipment to the United States. For purposes of paragraph (1), if a particular market situation exists such that the cost of materials and fabrication or other processing of any kind does not accurately reflect the cost of production in the ordinary course of trade, the administering authority may use another calculation methodology under this part or any other

constructed value (CV) under 19 U.S.C. §1677b(e), if DOC finds the existence of a PMS that the cost of materials and fabrication or other processing of any kind does not accurately reflect the cost of production in the ordinary course of trade, then DOC may use another calculation methodology under this part or any other calculation methodology. Section 504(c) of TPEA amended the statutory provision governing CV, 19 U.S.C. §1677b(e). The amendment authorized DOC to use alternative cost methodologies when computing CV after making a particular market situation determination. In other words, the amended statute gives DOC discretion to adjust the cost of production calculation methodology when determining CV if DOC finds that a PMS exists. Section 504 did not amend the statute governing the calculation of cost of production or application of the below-cost test set out in 19 U.S.C. §1677b(b)(3)⁹. Articles directly related to PMS are Article 504¹⁰ of TPEA. This clause contains three aspects of PMS (Chang, 2019).

① Ordinary course of trade: TPEA 504(a) (19 USC §1677(15) or Tariff Act of 1930 section 771(15)

In accordance with Anti-Dumping Agreement Article 2, both the normal price and the export price shall be compared with the price derived from the ordinary course of trade. The United States revised the definition of the ordinary course of trade that existed in the existing anti-dumping law through Article 504 (a) of the TPEA, and the amendment was to insert the following statement into the United States Code (USC) 1677(15) (C).

The term “ordinary course of trade” means the conditions and practices which, for a reasonable time prior to the exportation of the subject merchandise, have been normal in the trade under consideration with respect to merchandise of the same class or kind. The administering authority shall consider the following sales and transactions, among others, to be outside the ordinary course of trade:

(A) Sales disregarded under section 1677b(b)(1) of this title.

(B) Transactions disregarded under section 1677b(f)(2) of this title.

(C) Situations in which the administering authority determines that the particular market situation prevents a proper comparison with the export price or constructed export price.

calculation methodology. For purposes of paragraph (1), the cost of materials shall be determined without regard to any internal tax in the exporting country imposed on such materials or their disposition that is remitted or refunded upon exportation of the subject merchandise produced from such materials. (Underline been added by author)

⁹ <https://www.law.cornell.edu/uscode/text/19/1677b>

¹⁰ SEC. 504. PARTICULAR MARKET SITUATION

(a) DEFINITION OF ORDINARY COURSE OF TRADE. — Section 771(15) of the Tariff Act of 1930 (19 U.S.C. 1677(15)) is amended by adding at the end the following:

“(C) Situations in which the administering authority determines that the particular market situation prevents a proper comparison with the export price or constructed export price.”.

(b) DEFINITION OF NORMAL VALUE. —Section 773(a)(1)(B)(ii)(III) of the Tariff Act of 1930 (19 U.S.C. 1677b(a)(1)(B)(ii)(III)) is amended by striking “in such other country.”.

(c) DEFINITION OF CONSTRUCTED VALUE.—Section 773(e) of the Tariff Act of 1930 (19 U.S.C. 1677b(e)) is amended—(1) in paragraph (1), by striking “business” and inserting “trade”; and (2) by striking the flush text at the end and inserting the following: “For purposes of paragraph (1), if a particular market situation exists such that the cost of materials and fabrication or other processing of any kind does not accurately reflect the cost of production in the ordinary course of trade, the administering authority may use another calculation methodology under this subtitle or any other calculation methodology. For purposes of paragraph (1), the cost of materials shall be determined without regard to any internal tax in the exporting country imposed on such materials or their disposition that is remitted or refunded upon exportation of the subject merchandise produced from such materials.”.

② Third country price and PMS: TPEA 504(b) (19 USC §1677b(a)(1)(B)(ii)(III)¹¹ or Tariff Act of 1930 section 773(a)(1)(B)(ii)(III)¹²

The existing U.S. anti-dumping law prohibits the use of the third country domestic selling price as a normal price only when it is difficult to make a proper comparison between the selling price and the (constructed) export price due to PMS existing in a particular third country. However, TPEA deleted the phrase that PMS should exist “in such other country”, so under the law, even if PMS exists in the domestic market of export companies, the DOC cannot use the selling prices of third countries as normal prices.¹³

③ Constructed value and PMS: TPEA 504(c) (19 USC §1677b(e) or Tariff Act of 1930 section 773(e))

In accordance with the WTO Anti-Dumping Agreement Article 2.2, the constructed value is calculated by the sum of the production cost and the normal profit if the normal price is derived by the method of calculating the constructed value. At the end of 19 USC §1677b (e), the corresponding provisions of TPEA 504 (c) added the following provisions. For purposes of paragraph (1), if a particular market situation exists such that the cost of materials and fabrication or other processing of any kind does not accurately reflect the cost of production in the ordinary course of trade, the administering authority may use another calculation methodology under this subtitle or any other calculation methodology.¹⁴

3.2. PMS under WTO agreement

3.2.1. Article 2.2 of Anti-Dumping Agreement

Article 2 of the Anti-Dumping Agreement states whether dumping occurs and how dumping margins are calculated. Article 2.1¹⁵ stipulates that a product is to be considered as being dumped, that is introduced into the commerce of another country at less than its normal value, if the export price of the product exported from one country to another is less than the comparable price, in the ordinary course of trade, for the like product when destined for consumption in the exporting country.

Article 2.2. of the Anti-Dumping Agreement stipulates that when there are no sales of the like product in the ordinary course of trade in the domestic market of the exporting country or when, because of the particular market situation or the low volume of the sales in the domestic market of the exporting country, such sales do not permit a proper comparison, the

¹¹ 19 USC §1677b(a)(1)(B)(ii)(III)

the administering authority does not determine that the particular market situation prevents a proper comparison with the export price or constructed export price.

¹² Tariff Act of 1930 section 773(a)(1)(B)(ii)(III)

the administering authority does not determine that the particular market situation prevents a proper comparison with the export price or constructed export price.

¹³ The original text of the provisions of 19 USC §1677b (a) (1) (B) (ii) (III) as amended by section TPEA 504 (b) is as follows:

“the administering authority does not determine that the particular market situation ~~in such other country~~ prevents a proper comparison with the export price or constructed export price.”

¹⁴ Refer to footnote 8

¹⁵ For the purpose of this Agreement, a product is to be considered as being dumped, i.e. introduced into the commerce of another country at less than its normal value, if the export price of the product exported from one country to another is less than the comparable price, in the ordinary course of trade, for the like product when destined for consumption in the exporting country.

margin of dumping shall be determined by comparison with a comparable price of the like product when exported to an appropriate third country, provided that this price is representative, or with the cost of production in the country of origin plus a reasonable amount for administrative, selling and general costs and for profits.

PMS is first mentioned in Article 2.2, but the agreement does not provide a definition, application of PMS in a detailed manner. What is referred to in Article 2.2 of the Anti-Dumping Agreement is only up to the method of calculating the dumping margin. In particular, the export price is explicitly confirmed at the time of custom clearance, so how to calculate the normal price compared with export price is critical issue.

3.2.2. Article 2.2.1.1 Anti-Dumping Agreement

Detailed methods of calculating production costs are specified in Article 2.2.1.1¹⁶ of the Anti-Dumping Agreement. According to the agreement, the cost calculation to derive the normal price should be based on data prepared and recorded by the exporter or producer of the commodity under investigation, provided that such records are in accordance with the generally accepted accounting principles and data that reasonably reflect the costs associated with the production and sale of the commodity under investigation. The most important issue related to PMS is that the United States intends to increase the amount of dumping margin to impose a high rate of anti-dumping duties in relation to anti-dumping measures, and to achieve this goal, the concept of PMS is actively introduced to excessively increase the anti-dumping margin rate of many countries' exports.

Dumping Margin = Normal price – Exported price

<Priority of normal price selection under WTO Anti-Dumping Agreement>

Classification	Content	Condition	Remark
1st	Home market sales price	<ul style="list-style-type: none"> - Viability Test - Ordinary course of trade - Excluding sales calculation below cost 	
2nd	Third-country Sale price Constructed Value = Cost of production in the country of origin + Administrative, selling and general costs+ Profits	<ul style="list-style-type: none"> - No sales in the domestic market - The low volume of the sales in the domestic market of the exporting country (under 5%), such sales do not permit a proper comparison - If it is not an ordinary course of trade 	You can choose one of the contents.

Source: Choi (2019) p.9.

¹⁶For the purpose of paragraph 2, costs shall normally be calculated on the basis of records kept by the exporter or producer under investigation, provided that such records are in accordance with the generally accepted accounting principles of the exporting country and reasonably reflect the costs associated with the production and sale of the product under consideration. Authorities shall consider all available evidence on the proper allocation of costs, including that which is made available by the exporter or producer in the course of the investigation provided that such allocations have been historically utilized by the exporter or producer, in particular in relation to establishing appropriate amortization and depreciation periods and allowances for capital expenditures and other development costs. Unless already reflected in the cost allocations under this sub paragraph, costs shall be adjusted appropriately for those non-recurring items of cost which benefit future and/or current production, or for circumstances in which costs during the period of investigation are affected by start-up operations.

Article 2.2.1.1 is a detailed provision for calculating production costs under Article 2.2. Taking this into account, the calculation of the production cost to derive the normal price should normally be based on the data held by the exporter or producer of the product under investigation. However, in order to do so, two conditions must be met. First, the record must be prepared in accordance with the generally accepted accounting principle (GAAP) of the exporting country. Second, the records should reasonably reflect the costs associated with the production and the sale of product under investigation.

3.3. Judicial Precedent for PMS

3.3.1. DOC's application of PMS for OCTG¹⁷ is inconsistent with WTO rule

NEXTEEL, an OCTG exporter, produced and exported OCTG to the United States using HRC purchased from POSCO as a material. In this case, the DOC calculated NEXTEEL's cost of production in the country of origin in Korea. In question, the calculation of production cost based on the price supplied by a third-party company rather than the price provided by POSCO to NEXTEEL would violate Article 2.2.1.1 of the Anti-Dumping Agreement.

When complaining against the DOC's anti-dumping measures in violation of Article 2.2.1.1, it must specify what obligations the member states have violated as stipulated in the clause. For Korea, the DOC's above actions might be asserted to violate the obligations under Article 2.2.1.1. In other words, it can be argued that it is a violation of Article 2.2.1.1 that Korean steel product exporters have recorded in their accounting principles and submitted to the DOC the inputs prices or production cost data that reasonably reflect the costs associated with the production and the sale of the product under consideration within a specific time frame set by the DOC.¹⁸

Table 2. Issues between DOC and Korea Steel Makers

Grounds for PMS existence in Korea Market	Rebuttal on DOC argument
- Companies surveyed receive subsidies from the Korean government	- When applying POSCO ¹⁹ countervailing duties, AFA is applied as it is.
- Cost distortion with low-cost Chinese HRC import	- Oversupply is a phenomenon occurring all over the world; the cheap products made in China not only influenced the market of Korea - Chinese products are exported to the Korean market and also worldwide
- Strategic alliance (Strategic alliance between HRC suppliers and OCTG suppliers distorts HRC supply prices)	- Ambiguous meaning of strategic alliance - Judgment as to whether the HRC supply price is actually distorted due to a strategic alliance
- Distorted OCTG production costs due to distortion of electricity in Korea (The electricity supply value in Korea is distorted due to the intervention through the government's industrial policy, so the price is not the price set through competition)	- DOC had previously ruled that the pricing of electricity in Korea is not a subsidy provided by the government? - Determining low electrical charges is one of the several factors that recognize the existence of PMS

Source: Choi (2019) p.17.

¹⁷ Certain Oil Country Tubular Goods from the Republic of Korea: Final Results of Antidumping Duty Administrative Review; 2014-2015, 82 FR 18105, April 17, 2017 and accompanying Memorandum.

¹⁸ WTO Anti-Dumping Agreement Section 2.2.1.1

¹⁹ South Korean steel-making company

3.3.2. *International prices in EU-Biodiesel is not consistent with WTO rule*²⁰

The dispute is targeted at anti-dumping investigations conducted by the European Commission, an EU investigating authority on biodiesel products from Argentina.²¹

The EU Commission calculated anti-dumping margins ranging from 41.9% to 49.2% in the final decision. This high rate of dumping margin is due to the use of alternative costs of soybean and soybean oil, the main raw materials for biodiesel by the European Commission when calculating constructed value. In other words, the initial preliminary judgment was based on the actual production cost of soybean and soybean oil used by the Argentine producers, while the final judgment ignores this and claims that Argentina's Differential Export Tax System has distorted the price of soybeans in the Argentine domestic market. When constructing the Argentine producer's normal value, the EU authorities replaced the costs reported in the Argentine producers and exporters records for soybeans with reference prices published by the Argentine Ministry of Agriculture. In the EU authorities' view, these prices reflected the level of international prices and the price that would have prevailed in Argentina, but for the distortion.

On the other hand, Argentina claimed that Article 2(5) second subparagraph of the Basic Regulation is inconsistent with Article 2.2.1.1 of the Anti-Dumping Agreement by providing that the authorities shall reject or adjust the cost data of the producers or exporters as included in their records when those costs reflect prices which are abnormally or artificially low because they are affected by an alleged distortion. In addition, Argentina claimed that the provision at issue is inconsistent with Article 2.2 of the Anti-Dumping Agreement and Article VI:1(b)(ii) of the GATT 1994 by providing that the costs shall be adjusted or established in certain cases on any other reasonable basis including information from other representative markets.

The panel upheld Argentina's claim that the EU acted inconsistently with Article 2.2.1.1 of the Anti-Dumping Agreement by failing to calculate the cost of production of biodiesel on the basis of the records kept by the producers or exporters under investigation. The Panel considered that the reason stated by the EU authorities for disregarding producers' costs does not constitute a legally sufficient basis under Article 2.2.1.1 in concluding that the producers' records do not reasonably reflect the costs associated with the production and sale of biodiesel.

In addition, the Panel upheld Argentina's claim that the European Union acted inconsistently with Article 2.2 of the Anti-Dumping Agreement and Article VI:1(b)(ii) of the GATT 1994 by using a cost that was not the cost prevailing in Argentina, the country of origin, regarding the construction of the normal value.

3.3.3. *Sales-below-cost test is not allowed in a CIT decision*²²

DOC's argument conflates the sales-based versus cost-based particular market situation provisions in the Section 504(c) of TPEA. The court rejects this post hoc rationalization for

²⁰ WTO Appellate Body Report, European Union- Anti-Dumping Measures on Biodiesel from Argentina (EU-Biodiesel), WT/DS473/R, 29 March 2016. WTO Appellate Body Report, European Union – Anti-Dumping Measures on Biodiesel from Argentina (EU-Biodiesel), WT/DS473/AB/R, 6 October 2016. https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds473_e.htm

²¹ Lee. 2018. "PMS Methodology in Antidumping Investigations - New Implications for Antidumping and Countervailing Duty Investigation Laws, Regulations and Practices of Korea", p14.

²² USCIT, Saha Thai Steel Pipe Public Co., Ltd. & Thai Premium Pipe Co., Ltd. & Pacific Pipe Public Co., Ltd. v. United States & Wheatland Tube Co., Ltd. Slip Op. 19-165, Consol. Court No. 18-00214, Dec.18, 2019.

the Final Results²³, because the TPEA did not provide a basis for calculating the cost of production in the sales-below-cost test. CIT pointed out that the U.S. Congress explicitly amended the sales-below-cost provision for a different purpose which shows that Congress was aware of the sales-below-cost calculation when it enacted the TPEA Section 505(a)(A).²⁴ Congress amended the sales-below-cost provision and did not make a cross-reference between 19 U.S.C § 1677(15)²⁵ and 19 U.S.C. § 1677b(e)²⁶, which shows that Congress did not intend for DOC to apply 19 U.S.C. § 1677(15) (C) in the manner DOC proposes.

Because DOC chose to make a comparison between home-market sales and U.S. price, DOC may not apply a cost-based particular market situation adjustment in the context of this sales-based comparison. DOC's post hoc rationalization does not support the Final Results. The court concludes that DOC's particular market situation adjustment is not in accordance with the TPEA. Section 504 did not amend 19 U.S.C. § 1677b(b)(3), which governs the cost of production calculations in determining whether home-market sales are below costs. Neither the term ordinary course of trade nor a reference to a particular market situation cost adjustment appears in Section 1677b(b)(3). It is clear that Section 504 authorized Commerce's comparison of U.S. prices to home-market sales instead of constructed value which is an interpretation that is unsupported in the law. From the three cases with an in-depth legal analysis, it is clarified that DOC dumping margin calculation methodology based on PMS might be inconsistent with WTO Anti-Dumping Agreement.

Table 3. Case Analysis

Case	Covered Article	Decision
Korean-Certain Oil Country Tubular case	WTO Anti-Dumping Agreement Article 2.2.1.1	- CV has been calculated without the actual production cost record prepared in accordance with GAAP of the producer or exporter.
EU-Biodiesel case	WTO Anti-Dumping Agreement Article 2.2 & 2.2.1.1	- a "cost" that was not the cost prevailing "in the country of origin", Argentina, in the construction of the normal value (inconsistently with Article 2.2) - EU doesn't calculate the cost of production of biodiesel on the basis of the records kept by the producers/exporter under investigation (inconsistently with Article 2.2.1.1)
Thailand-circular welded carbon steel pipes and tubes case	WTO Anti-Dumping Agreement Article 2.2.1.1	- Conflating the sales-based versus cost-based PMS might not be consistent with WTO Anti-dumping rule. That costs shall normally be calculated on the basis of records kept by the exporter, providing generally accepted accounting principles and reasonably reflection of the costs.

²³ See the Department of Commerce (Commerce) determines that circular welded carbon steel pipes and tubes (pipes and tubes) from Thailand are being, or are likely to be sold, at less than normal value during the period of review (POR), March 1, 2016, through February 28, 2017, available at: <https://www.federalregister.gov/d/2018-22237/p-2>

²⁴ Public Law 114-27-June 29, 2015 / 129 STAT.385&386

<https://www.congress.gov/114/plaws/publ27/PLAW-114publ27.pdf>

²⁵ 19 U.S.C. § 1677(15) <https://www.law.cornell.edu/uscode/text/19/1677>

²⁶ Refer to footnote 8

4. Critique for DOC Econometric Models

4.1. Background of regression analysis

The domestic interest parties (DIPs) provided a regression analysis.²⁷ DOC accepted the information contained in the DIP's submission, and gave interested parties an opportunity to comment.²⁸ The global steel overcapacity displaces domestic production worldwide, causing a flood of unfairly traded imports from predatory countries which, in turn, place a substantial downward pressure on domestic prices of steel, causing a distortion in that domestic market.²⁹ The surge in unfairly traded imports of steel into India compounds the distortive effects on HRC prices in that market.³⁰ An econometric regression model predicts that Indian import AUV (of HS7208) would have been \$796 per metric ton if there was not an overcapacity in the global market, comparing to \$ 575, as of 2017, meaning that it should be adjusted to upper 38.54% in the normal value.

DOC should use the global excess capacity-based regression analysis provided in the record that quantifies the impact of the global steel excess capacity on the price of HRC in India, and derives a corresponding percentage adjustment factor that accounts for the distortions inherent to an overcapacity-driven PMS.³¹ In the end, DOC determined high antidumping duty adjusted by the least square regression analysis of an econometric model.

4.2. DIP Econometric Modelling Shortcomings

4.2.1. Ordinary least squares (OLS) regression model

The regression analysis used by DIPs relies on imports AUVs (of HS7208) as a proxy for domestic HRC prices within each country. The assumption that the imports AUV is an appropriate proxy for the domestic hot-rolled coil prices and well justified by the data. In order to control for any other factors that may be driving the observed correlation between global excess capacity and steel prices, they describe an ordinary least squares (OLS) regression model to identify the partial effect of each factor, holding all else equal

$$\begin{aligned} \ln(\text{ImportAUV}_{i,t}) = & \beta_0 + \beta_1 \cdot \ln(\text{UneconomicCapacity}_t) + \beta_2 \cdot \ln(\text{IronOre}_t) \\ & + \beta_3 \cdot \ln(\text{Scrap}_t) + \beta_4 \cdot \ln(\text{ExRate}_{i,t}) + \beta_5 \cdot \ln(\text{GFCF}_{i,t}) + \\ & \beta_6 \cdot \ln(\text{Aluminum}_t) + \alpha_i + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Where:

$\ln(\text{Import AUV}_{i,t}) = \log(\text{the import AUV of country } i, \text{ in year } t)$

$\ln(\text{UneconomicCapacity}_t) = \log(\text{the capacity of Crude Steel- the production of Crude Steel in year } t)$

$\ln(\text{IronOre}_t) = \log(\text{USD per metric ton of iron ore in year } t)$

$\ln(\text{Scrap}_t) = \log(\text{USD per metric ton of steel scrap in year } t)$

²⁷ See DIPs' Letter, "Certain Welded Carbon Steel Standard Pipes and Tubes from India: Revised PMS Valuation Methodology," dated March 22, 2019 (Regression Analysis).

²⁸ See Commerce's Letter, dated March 27, 2019.

²⁹ Id., at 30-41, citing numerous data sources, articles, reports, and information submitted on records of other cases, on global steel excess capacity crisis and its effects (Exhibits 2, 17-27, 30, 38-39, 41-60, 79, and 85).

³⁰ Id.

³¹ See, generally, the Alternative PMS Valuation Calculation.

$\ln(\text{ExRate}_{i,t}) = \log(\text{Index of annual exchange rates, reported as Local Currency Units per U.S. dollar of country } i, \text{ in year } t)$

$\ln(\text{GFCF}_{i,t}) = \log(\text{national gross fixed capital formation of country } i, \text{ in year } t)$

$\ln(\text{Aluminum}_t) = \log(\text{USD per metric ton of global aluminum in year } t)$

$\varepsilon_{i,t}$ = error term

DIPs presented the data set in terms of the level of global uneconomic capacity in a given year,³² the import AUV for hot-rolled steel imports (HS7208) each country in the sample and a number of control variables. The regression analysis period is only 10 years (2008-2017) and there are 38 countries in the sample with 377 observations.

4.2.2. Results of the OLS Model

$$\ln(\text{ImportAUV}_{i,t}) = 9.82 - 0.59 \cdot \ln(\text{UneconomicCapacity}_t) + 0.15 \cdot \ln(\text{IronOre}_t) + 0.38 \cdot \ln(\text{Scrap}_t) - 0.21 \cdot \ln(\text{ExRate}_{i,t}) - 0.01 \cdot \ln(\text{GFCF}_{i,t}) - 0.15 \cdot \ln(\text{Aluminum}_t) - 0.07 \quad (2)$$

The model finds that a 10 percent increase in global excess steel capacity results in a 5.9 percent decrease in national import AUVs of hot-rolled steel. Regarding the estimated effects of other factors, the coefficients for iron ore and steel scrap prices are positive. Both iron ore price and steel scrap price are significant. This two factors are expected for the price of inputs. The coefficient for exchange rates is a negative result consistent with basic economic theory. Gross fixed capital formation, a measure of national investment in non-financial assets has a statistically and economically insignificant impact on import AUVs, and the effect of the aluminum price is negative and statistically significant.

In order to prevent the risk of endogeneity bias, they utilized a two stage least squares(2SLS) regression using an instrumental variables approach to identify the independent causal effects of supply-and demand-side factors. This is a conventional methodology in economics that emphasizes identifying causation (and not just correlation) of a variable's effect on steel prices. Ordinary least squares(OLS) assumption is that explanatory variables are not correlated with the error term e . ($\text{cov}(x, e)=0$). It is called consistency of the least squares estimators. This terminology is used in various discipline which means determined outside of a system. If x is random and correlated with the error term, the method of moments leads us to an alternative, called instrumental variables estimation or two-stage least squares estimation, that will work in large samples. Two-Stage least squares (2SLS) regression analysis is an empirical methodology that is used in the analysis of structural equations. This method is the alternative way of the OLS when the dependent variable's error terms are correlated with the independent variables.

4.2.3. Two stage least squares (2SLS) regression Model

$$\ln(\text{Consumption}_{i,t}) = \pi_0 + \pi_1 \cdot \ln(\text{UneconomicCapacity}_t) + \pi_2 \cdot \ln(\text{IronOre}_t) + \pi_3 \ln(\text{Scrap}_t) + \pi_4 \cdot \ln(\text{ExRate}_{i,t}) + \pi_5 \cdot \ln(\text{GFCF}_{i,t}) + \pi_6 \cdot \text{GDP}_{g,t} + \pi_7 \cdot \ln(\text{Aluminum}_t) + \pi_8 \cdot \ln(\text{Brent}_t) + \pi_9 \cdot \ln(\text{Vehicles}_{i,t}) + \alpha_{1,i} + v_{i,t} \quad (3)$$

³² **Uneconomic capacity** is defined as the amount of global excess capacity in excess of the highest level of global annual production ever experienced prior to a given year. As discussed in more detail below, this refined measure of overcapacity avoids potential problems with circularity in the direction of causal factors.

$$\ln(\text{ImportAUV}_{i,t}) = \beta_0 + \beta_1 \cdot \ln(\text{Consumption}_{i,t}) + \beta_2 \cdot \ln(\text{UneconomicCapacity}_t) + \beta_3 \cdot \ln(\text{IronOre}_t) + \beta_4 \cdot \ln(\text{Scrap}_t) + \beta_5 \cdot \ln(\text{ExRate}_{i,t}) + \alpha_{2,i} + \varepsilon_{i,t} \quad (4)$$

Where:

$\ln(\text{Consumption}_{i,t})$ = log (Consumption of crude steel of country i, and in year t. million metric tons)

$\ln(\text{UneconomicCapacity}_t)$ = log (the capacity of Crude Steel- the production of Crude Steel in year t)

$\ln(\text{IronOre}_t)$ = log (USD per metric ton of iron ore in year t)

$\ln(\text{Scrap}_t)$ = log (USD per metric ton of steel scrap in year t)

$\ln(\text{ExRate}_{i,t})$ = log (Index of annual exchange rates, reported as Local Currency Units per U.S. dollar of country i, in year t)

$\ln(\text{GFCF}_{i,t})$ = log (national gross fixed capital formation of country i, in year t)

$\ln(\text{GDP}_{g,i,t})$ = log (Annual percent change in GDP of country i, in year t)

$\ln(\text{Aluminum}_t)$ = log (USD per metric ton of global aluminum in year t)

$\ln(\text{Brent}_t)$ = log (USD per barrel of brent crude oil in year t)

$\ln(\text{Vehicles}_{i,t})$ = log (Provisional registrations or sales of new vehicles of country i, in year t)

$\varepsilon_{i,t}$ = error term

Under US 2SLS regression analysis potential variables, these two conditions were not satisfying and that should be uncorrelated with the unobservable factors and correlated with independent variable. Where the endogenous variables are Consumption and Import AUV for each country, i, and year, t. The exogenous determinants of Consumption (the “instruments”) are gross fixed capital formation(GFCF), GDP growth(GDPg), the aluminum price(Aluminum), the Brent crude oil price(Brent), and motor vehicle sales(Vehicles). The Consumption is predicted based on the instruments and the other explanatory variables in the first stage, and that predicted value is then plugged into the second-stage equation. The results of 2SLS can be seen below.

$$\ln(\text{ImportAUV}_{i,t}) = 8.55 - 0.07 \cdot \ln(\text{Consumption}_{i,t}) - 0.53 \cdot \ln(\text{UneconomicCapacity}_t) + 0.12 \cdot \ln(\text{IronOre}_t) + 0.36 \cdot \ln(\text{Scrap}_t) - 0.23 \cdot \ln(\text{ExRate}_{i,t}) + 0.09 \quad (5)$$

The model finds, all else equal, that a 10 percent increase in global excess steel capacity results in a 5.3 percent decrease in national import AUVs of hot-rolled steel. The iron ore and scrap prices are positively associated with the hot-rolled steel price, which is to be expected for inputs to the goods’ production. The coefficient for exchange rates is negative, as expected. The model yields statistically and economically significant results that can be applied to 2017 data to predict the 2017 Indian import AUV that would have prevailed under a given level of global capacity utilization. Specifically, the model predicts that the Indian import AUV would have been \$796.77 per metric ton if the global steel industry had operated at a utilization rate of 85 percent. This counterfactual AUV is 38.54 percent higher than the actual 2017 Indian import AUV of \$575.12.

Hausman test can be used to determine if it is better to use an instrumental variable method (2SLS) rather than a mere OLS estimation. It can also be used to compare OLS with 2SLS which is more efficient. In panel data empirical analysis, the Hausman test can help us to choose fixed effects model or a random effects model. In a regression model, the Hausman test detects endogenous regressors. Endogenous variables have values that are determined by other variables in the system. When we are deciding on the best regression method, the first thing is to figure out if the predictor variables are endogenous by using Hausman test. The

2SLS estimator is less efficient than OLS when the explanatory variables are exogenous; as we have seen, the 2SLS estimates can have very large standard errors. Therefore, it is useful to have a test for endogeneity of an explanatory variable that shows whether 2SLS is even necessary. Hausman (1978) suggested directly comparing the OLS and 2SLS estimates and determining whether the differences are statistically significant. (Wooldridge at 534) The results of Hausman test are showed in Table 7. However, DOC did not check the Hausman test to calculate the dumping margin.

4.3. Instability of DIP's Regression Result

4.3.1. Extension of data period

Fundamentally, the regression model used by the DOC to impose anti-dumping tariffs is an unstable economic model that is difficult to accept as it does not meet general economic conditions to analyze. It alleged that the empirical results might also be biased. Therefore, we criticized the empirical economic model used by the United States, by pointing out the weakness of instrumental variable, expanding the analysis period and attempting analysis with different classifications of countries. It would be revealed a different result from that of U.S. Commerce.

To check the stability and robustness of DIP's regression results, in this paper, we extend the time period from 10 years to 18 years and separate targeted countries into the two groups. The period is 2000-2017 and there are 26 countries in the sample, allowing for a total 468 observations.

Table 4. Data Source

	Variable	Description	Source
Global Measures (no variation across countries)	Production	Global production of crude steel, million metric tons	World Steel Association Statistical Yearbook
	Capacity	Global steelmaking capacity, million metric tons	OECD Steelmaking capacity database
	Uneconomic Capacity	Global capacity in excess of highest-level annual product in prior years, million metric tons	Calculated from Capacity & Production
	Aluminum Price	Aluminum price (annual average), via LME, USD per metric ton	World Bank
	Iron Ore Price	MBIO Index Iron Ore 62% Fe Fines CFR, Qingdao, includes cost and freight, USD per metric ton	World Bank Commodity Price Data (The Pink Sheet)
	Steel Scrap Price	USD per metric ton	LME Historical Settlement Prices
	Brent Oil Price	Brent crude oil price, Europe, dollars per barrel, annual averages of daily (not seasonally adjusted) prices	Federal Reserve Bank of St. Louis (series DCOILBRETEU)

Table 4. (Continued)

	Variable	Description	Source
Country/year-specific Measures	Import AUV	Import AUV for HS7208(total imports from world), USD per metric ton	UN Comtrade
	Steel Consumption	Consumption of crude steel, million metric tons	World Steel Association Statistical Yearbook 2018, Table 39 at 77.
	Exchange Rates	Index of annual exchange rates, reported as Local Currency Units per U.S. dollar.	OECD
	Motor Vehicle Sales	Provisional registrations or sales of new vehicles-All Types.	OICA
	GDP growth	Annual percent change in GDP	World Bank
	Gross Fixed Capital Formation	Gross fixed capital formation in constant 2010 USD.	World Bank

4.3.2. Results of the regression Model

The variables remain unchanged, the extension of research period model shows that a 10 percent increase in global excess steel capacity results in a 1.2 percent decrease in national import AUVs of hot-rolled steel. There is a big gap between DIP’s 10-year data regression results and 18-year period regression’s one. It is roughly 5 times between two coefficients of 0.59 to 0.12.

Table 5. Different Period of Data

	Steelmaking Capacity Group			
	Data of USDOC (10years)		Extended Data Set of Author (18 years)	
	Fixed Effects OLS	Fixed Effects 2SLS	Fixed Effects OLS	Fixed Effects 2SLS
Uneconomic Capacity	-0.5886*** (0.0398)	-0.5260*** (0.0216)	-0.123117*** (0.0002)	-0.111760*** (0.0005)
Iron Ore Price	0.1548*** (0.0330)	0.1154*** (0.0341)	0.001348*** (0.0000)	0.003978*** (0.0000)
Scrap Price	0.3754*** (0.0499)	0.3584*** (0.0460)	0.0000231 (0.9454)	0.000714** (0.0456)
Exchange Rate Index	-0.2087*** (0.0472)	-0.2252*** (0.0455)	-0.00000601 (0.8060)	-0.00000216 (0.9350)
Consumption	-	-0.0661* (0.0340)	-	0.920533*** (0.0000)
Gross Fixed Capital Formation (GFCF)	-0.0077 (0.0315)	Used as instrument	0.647182*** (0.0000)	Used as instrument
Aluminum Price	-0.1521** (0.077)	Used as instrument	0.900934*** (0.0000)	Used as instrument
F-statistics	-	-	171.3048	144.7882
R-squared	0.8960	-	0.9241	0.9086

Standard errors in parentheses

* p<0.1, **p<0.05, *** p<0.01 (More stars mean more statistically significant; no stars mean not significant).

Further, if targeted countries were divided into two groups, high-low level of production, according to the steel production capacity, and the coefficient was 0.24 and 0.14 respectively, which was also quite different from the coefficient of 0.59 of the DIP.

Table 6. Different Country's Data

	Steelmaking Capacity Group					
	Data of USDOC (10years)		Extended Data Set of Author (18years)			
	Fixed Effects OLS	Fixed Effects 2SLS	Big Capacity Group		Small Capacity Group	
			Fixed Effects OLS	Fixed Effects 2SLS	Fixed Effects OLS	Fixed Effects 2SLS
Uneconomic Capacity	-0.5886*** (0.0398)	-0.5260*** (0.0216)	-0.240510** (0.0481)	-0.310256*** (0.0066)	-0.138208** (0.0118)	-0.122702** (0.0194)
Iron Ore Price	0.1548*** (0.0330)	0.1154*** (0.0341)	-0.000191 (0.8207)	0.001937*** (0.0000)	0.000956 (0.2059)	0.002445*** (0.0000)
Scrap Price	0.3754*** (0.0499)	0.3584*** (0.0460)	-0.000882 (0.1131)	-0.000228 (0.6382)	0.000129 (0.7996)	0.000222 (0.6273)
Exchange Rate Index	-0.2087*** (0.0472)	-0.2252*** (0.0455)	0.000964 (0.2227)	0.000553 (0.4822)	0.00000827 (0.7459)	-0.0000195 (0.4198)
Consumption	-	-	-	0.703401*** (0.0014)	-	0.752713*** (0.0001)
Gross Fixed Capital Formation (GFCF)	-0.0077 (0.0315)	Used as instrument	0.433851** (0.0102)	Used as instrument	0.227846 (0.2393)	Used as instrument
Aluminum Price	-0.1521** (0.077)	Used as instrument	1.390042*** (0.0057)	Used as instrument	0.954378** (0.0240)	Used as instrument
F-statistics	-	-	83.4258	24.3664	124.1826	124.4306
R-squared	0.8960	-	0.8748	0.3483	0.9123	0.9073

Standard errors in parentheses

*** p<0.01, **p<0.05, *p<0.1 (More stars mean more statistically significant; no stars mean not significant.)

For Hausman Test, the p value is 1, so the data showed that we cannot refuse null hypothesis as random effects are effective. Because USDOC should choose the random effect, as it is seen I additionally calculated random effects in table 7.

Taking a close look at the calculation process of DIP, there is a critical error that DIP used the figure 5.8 instead of 2.5. (Appendix Table B³³) With the same regression model, data, targeted countries, there is a wide range of prediction resulting from a minimum of 7.8% to a maximum of 38.54%, which is a very unstable to provide the base of calculation for anti-dumping margin.

³³ E=ln(D)=ln(319.3)=2.50

Table 7. Correlated Random Effects-Hausman Test

Test Summary	Chi-Sq. Statistic		Chi-Sq. d.f.		Prob.	
Cross-section random	0.000000		6		1.0000	
Steelmaking Capacity Group						
	Data of Author (18years)			Extended Dataset of Author (18years)		
			Big Capacity Group		Small Capacity Group	
	Cross-section random	Cross-section random	Cross-section random	Cross-section random	Cross-section random	Cross-section random
	Effects OLS	Effects 2SLS	Effects OLS	Effects 2SLS	Effects OLS	Effects 2SLS
Uneconomic Capacity	-0.100117*** (0.0017)	-0.104859*** (0.0006)	-0.185855*** (0.0061)	-0.088121 (0.1435)	-0.059476* (0.0901)	-0.077674** (0.0200)
Iron Ore Price	0.001281*** (0.0000)	0.004017*** (0.0000)	-0.001451*** (0.0028)	0.003918*** (0.0000)	0.001418*** (0.0001)	0.004003*** (0.0000)
Scrap Price	-0.000118 (0.7201)	0.000674* (0.0557)	-0.000184 (0.7303)	-0.000779 (0.1851)	0.000243 (0.5534)	0.000435 (0.2900)
Exchange Rate Index	3.91E-07 (0.9837)	1.05E-05 (0.6070)	0.000425 (0.1098)	0.000131 (0.6589)	1.28E-05 (0.4007)	-6.45E-06 (0.6780)
Consumption	-	0.828449*** (0.0000)	-	0.710564*** (0.0000)	-	1.105996*** (0.0000)
Gross Fixed Capital Formation (GFCF)	0.665333*** (0.0000)	Used as instrument	0.772748*** (0.0000)	Used as instrument	0.524666*** (0.0000)	Used as instrument
Aluminum Price	0.900038*** (0.0000)	Used as instrument	0.675018*** (0.0058)	Used as instrument	1.121611*** (0.0000)	Used as instrument
F-statistics	165.672100	152.404400	62.752350	47.900710	108.651800	130.606300
R-squared	0.683169	0.622556	0.623870	0.512303	0.741726	0.741213

Standard errors in parentheses

*** p<0.01, **p<0.05, *p<0.1(More stars means more statistically significant; no stars means not significant.)

Table 8. Wide Range of Regression Results based on Overcapacity

	10-year data Regression Result (by U.S.)	18-year Data Projection
Uneconomic Capacity	-0.59	-0.12
In(Implied Uneconomic Capacity (million MTs))	5.8	2.5
Percent Difference from Actual Import AUV (%)	38.54%	7.8%

5. Conclusion

The U.S. TPEA of 2015 enabled the DOC to inflate dumping margin when the PMS exists in the exporter's home market. DOC applied PMS provisions to the steel products from Korea. This paper analyzes whether DOC's calculation by using the regression analysis is

consistent with WTO rules and investigates whether DOC's regression analysis application is stable.

Results show that DOC's argument conflating the sales-based with cost-based PMS designed to inflate dumping margins is not in accordance with the TPEA by the CIT and might not be consistent with WTO Antidumping Agreement Article 2.2 and 2.2.1.1. That costs shall normally be calculated on the basis of the records kept by the exporter, providing generally accepted accounting principles and reasonably reflection of the costs.

The econometric model used by DOC has an unacceptable way of calculation. Using an instrumental variable, it did not test potential variables that could meet these two conditions and that should be uncorrelated with the unobservable factors and correlated with independent variable. It has also not checked the process of Hausman test that can be used to determine if it is better to use an instrumental variable method (2SLS) rather than a mere OLS estimation. The Hausman test can help to choose fixed effects model or a random effects model.

Even if it might be consistent with WTO Antidumping Agreement, DOC's calculated margin by the regression analysis by using 10-year data is a big gap between 18-year data regression and different countries' data through the same methodology, which is a roughly 5 times between two results that the coefficient was reduced from 0.59 to 0.12. It means that the normal value adjusted by a wide range of the regression results from actual import AUV would be unstable from 7.8% to 38.54%.

In the end, inflating dumping margin by DOC using regression analysis would not only be inconsistent with WTO rules, but also regression coefficient projection is unstable. It is absolutely impossible to accept the calculation of the constructed value based on PMS with a least square regression methodology.

In future studies, it is necessary to improve the accuracy of the data, such as increasing the years of the research data, and it will be needed to carry out a two-directions study by using law and regression analysis in-depth.

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Appendices

Table A. Steelmaking Capacity of 26 Countries

Top 13 countries			Bottom 13 countries		
Rank	Country	Million metric tons	Rank	Country	Million metric tons
1	China	674.1	1	Canada	16.8
2	Japan	131.5	2	Poland	12.1
3	USA	112.8	3	Austria	8.2
4	Russia	75.6	4	Netherlands	7.8
5	India	74.8	5	Czechia	7.6
6	Korea	68	6	Indonesia	7.3
7	Germany	51.6	7	Australia	7.2
8	Brazil	42.3	8	Sweden	6
9	Italy	36.7	9	Slovakia	5.5
10	France	22.1	10	Finland	4.8
11	Mexico	21.6	11	Hungary	2.3
12	Spain	21.5	12	Chile	2
13	United Kingdom	17.3	13	Slovenia	0.7

Table B. DIP's Coefficients Estimated by the Model

	log(\$/MT)	log(Unit)	log(\$/MT)					
Parameter	USDOC_Estimated Effect on India's Import AUV (in natural logs)		2017 Value (in natural logs)	Author's Estimated Effect on India's Import AUV (in natural logs)				
β_0 :Constant	9.818309		n/a					
β_1 :Effect of Uneconomic Capacity	-0.588552		6.36596	-0.123117				
β_2 :Iron Ore Price	0.154754		4.26788	0.001348				
β_3 :Scrap Price	0.375388		5.51767	0.0000231				
β_4 :Exchange Rate Index	-0.208694		5.00855	-0.00000601				
β_5 :Gross Fixed Capital Formation	-0.007653		27.34226	0.647182				
β_6 :Aluminum Price	-0.152147		7.58460	0.900934				
α_1 :Inida Fixed Effect	-0.067340		n/a					
Calculations:	Global capacity if operating at 85%, based on actual production	Implied Capacity minus previous all-time high production	Natural log of implied uneconomic capacity	See note	Exponentiation of natural log	Actual value-not calculated	Estimate d's Percent Difference from Actual	
2017 Global production (million MTs)	Production (Previous All-Time High) * (million MTs)	Implied Capacity (million MTs)	Implied Uneconomic Capacity (million MTs)	Natural Log of Implied Uneconomic Capacity (In (million MTs)	Est.India n Import AUV In(\$/MT)	Est.Indian Import AUV(\$/MT)	Actual Indian Import AUV in 2017(\$/MT)	Percent Difference from Actual Import AUV (%)
A	B	C=A/0.85	D=C-B	E=ln(D)	F (see note)	G=exponent(F)	H	=(G-H)/H
1,690.5	1,669.5	1,988.8	319.3	5.8	6.68	\$796.77	\$575.12	38.54%

Note: The calculation of the estimated AUV in log form (column F). Where i is India and k relates to each explanatory variable, X, listed above. The Betas and Alpha are estimated by the OLS model. The AUV and all of the Xs are in natural log.

$$Est. AUV_{India2017} = \beta_0 + \beta_1 \cdot ImpliedUneconomicCapacity_{2017} + \sum_{k=2}^6 (\beta_k + X_{K,India,2017}) + \alpha_{i=India}$$