Ferrovanadium from Korea

Investigation No. 731-TA-1315 (Final)

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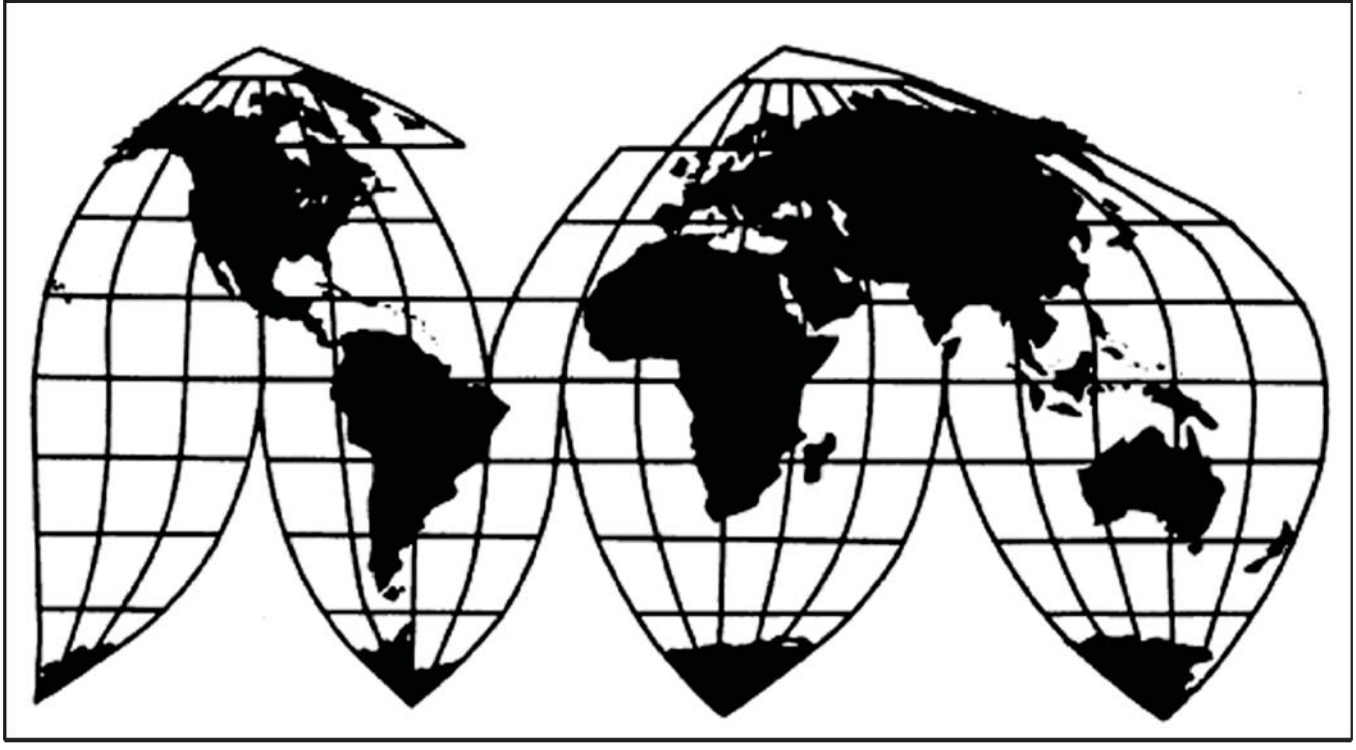
U.S. International Trade Commission



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UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-1315 (Final)
Ferrovanadium from Korea

DETERMINATION

On the basis of the record[1] developed in the subject investigation, the United States International Trade Commission ("Commission") determines, pursuant to the Tariff Act of 1930 ("the Act"), that an industry in the United States is materially injured by reason of imports of ferrovanadium from Korea, provided for in subheading 7202.92.00 of the Harmonized Tariff Schedule of the United States, that have been found by the Department of Commerce ("Commerce") to be sold in the United States at less than fair value ("LTFV").

BACKGROUND

The Commission, pursuant to section 735(b) of the Act (19 U.S.C. 1673d(b)), instituted this investigation effective March 28, 2016, following receipt of a petition filed with the Commission and Commerce by AMG Vanadium LLC of Cambridge, Ohio; Evergreen Metallurgical Company DBA Bear Metallurgical Company of Butler, Pennsylvania; Gulf Chemical and Metallurgical Corporation of Freeport, Texas; and Evraz Stratcor, Inc. of Hot Springs, Arkansas (collectively the Vanadium Producers and Reclaimers Association). The Commission scheduled the final phase of the investigation following notification of a preliminary determination by Commerce that imports of ferrovanadium from Korea were being sold at LTFV within the meaning of section 733(b) of the Act (19 U.S.C. 1673b(b)). Notice of the scheduling of the final phase of the Commission's investigation and of a public hearing to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the *Federal Register* on December 5, 2016 (81 FR 87590). The hearing was held in Washington, DC, on March 21, 2017, and all persons who requested the opportunity were permitted to appear in person or by counsel.

[1] The record is defined in sec. 207.2(f) of the Commission's Rules of Practice and Procedure (19 CFR 207.2(f)).

Views of the Commission

Based on the record in the final phase of this investigation, we determine that an industry in the United States is materially injured by reason of imports of ferrovanadium from Korea found by the U.S. Department of Commerce ("Commerce") to be sold in the United States at less than fair value.

I. Background

On March 28, 2016, the Vanadium Producers and Reclaimers Association ("VPRA") filed an antidumping duty petition jointly with each of its four individual members: domestic producer AMG Vanadium LLC ("AMG"); domestic producer Bear Metallurgical Company ("Bear"); wholesaler Gulf Chemical and Metallurgical Corporation ("Gulf");[1] and wholesaler Evraz Stratcor, Inc. ("Evraz Stratcor") (collectively "petitioners"). Petitioners appeared at the hearing accompanied by counsel and submitted prehearing and posthearing briefs and final comments.

One respondent participated in the final phase of this investigation. Counsel for Korvan Industry Co. Ltd. ("Korvan"), a producer of the subject merchandise, submitted a posthearing brief.

U.S. industry data are based on questionnaire responses of nine firms, consisting of two groups. The first group includes producers that either produce ferrovanadium for their own account or process the product for the account of other firms under a toll agreement. This group consists of the two domestic producers AMG and Bear. The second group includes tolling customer firms that provide raw materials to the producer, retain title to the product produced, and ultimately sell the ferrovanadium in the commercial market. This group is commonly referred to as tollees and consists of CCMA, LLC ("CCMA"), Energy Fuels, Inc. ("Energy Fuels"), Evraz Stratcor, Glencore Ltd., Gulf, Millbank Materials PA Ltd. ("Millbank"), and Traxys North America LLC ("Traxys"). U.S. imports are based on official Commerce statistics and the questionnaire responses of 23 U.S. importers that are believed to have accounted for nearly all U.S. imports of ferrovanadium in 2015. Foreign industry data and related information are based on the three questionnaire responses of Fortune Metallurgical (solely an exporter), Korvan, and Woojin Ind. Co. ("Woojin"), firms believed to account for the majority of ferrovanadium exports from Korea and whose combined exports to the United States were equivalent to nearly all U.S. imports of ferrovanadium from Korea in 2015.[2]

[1] Bear toll produces vanadium pentoxide provided by its customers into ferrovanadium. Petition, Vol. I at 4, 10. One of Bear's tollees, Gulf, previously owned Bear. Petitions, Vol. I at 21.

[2] Confidential Report, as revised by Memorandum INV-PP-046 (Apr. 12, 2017) ("CR") at I-5-6, Public Report ("PR") at I-4.

II. Domestic Like Product

A. In General

In determining whether an industry in the United States is materially injured or threatened with material injury by reason of imports of subject merchandise, the Commission first defines the "domestic like product" and the "industry."[3] Section 771(4)(A) of the Tariff Act of 1930, as amended ("the Tariff Act"), defines the relevant domestic industry as the "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[4] In turn, the Tariff Act defines "domestic like product" as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation."[5]

The decision regarding the appropriate domestic like product in an investigation is a factual determination, and the Commission has applied the statutory standard of "like" or "most similar in characteristics and uses" on a case-by-case basis.[6] No single factor is dispositive, and the Commission may consider other factors it deems relevant based on the facts of a particular investigation.[7] The Commission looks for clear dividing lines among possible like products and disregards minor variations.[8] Although the Commission must accept Commerce's determination as to the scope of the imported merchandise that is subsidized or sold at less than fair value,[9] the Commission determines what domestic product is like the imported articles Commerce has identified.[10]

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[3] 19 U.S.C. § 1677(4)(A).

[4] 19 U.S.C. § 1677(4)(A).

[5] 19 U.S.C. § 1677(10).

[6] *See, e.g., Cleo Inc. v. United States*, 501 F.3d 1291, 1299 (Fed. Cir. 2007); *NEC Corp. v. Department of Commerce*, 36 F. Supp. 2d 380, 383 (Ct. Int'l Trade 1998); *Nippon Steel Corp. v. United States*, 19 CIT 450, 455 (1995); *Torrington Co. v. United States*, 747 F. Supp. 744, 749 n.3 (Ct. Int'l Trade 1990), aff'd, 938 F.2d 1278 (Fed. Cir. 1991) ("every like product determination 'must be made on the particular record at issue' and the 'unique facts of each case'"). The Commission generally considers a number of factors, including the following: (1) physical characteristics and uses; (2) interchangeability; (3) channels of distribution; (4) customer and producer perceptions of the products; (5) common manufacturing facilities, production processes, and production employees; and, where appropriate, (6) price. See *Nippon*, 19 CIT at 455 n.4; *Timken Co. v. United States*, 913 F. Supp. 580, 584 (Ct. Int'l Trade 1996).

[7] *See*, *e.g.*, S. Rep. No. 96-249 at 90-91 (1979).

[8] *Nippon*, 19 CIT at 455; *Torrington*, 747 F. Supp. at 748-49; *see also* S. Rep. No. 96-249 at 90-91 (Congress has indicated that the like product standard should not be interpreted in "such a narrow fashion as to permit minor differences in physical characteristics or uses to lead to the conclusion that the product and article are not 'like' each other, nor should the definition of 'like product' be interpreted in such a fashion as to prevent consideration of an industry adversely affected by the imports under consideration.").

[9] *See*, *e.g., USEC, Inc. v. United States*, 34 Fed. Appx. 725, 730 (Fed. Cir. 2002) ("The ITC may not modify the class or kind of imported merchandise examined by Commerce."); *Algoma Steel Corp. v.*

(Continued...)

B. Product Description

Commerce defined the imported merchandise within the scope of this investigation as:

> all ferrovanadium regardless of grade (i.e., percentage of contained vanadium), chemistry, form, shape, or size. Ferrovanadium is an alloy of iron and vanadium. Ferrovanadium is classified under Harmonized Tariff Schedule of the United States ("HTSUS") item number 7202.92.0000. Although this HTSUS item number is provided for convenience and Customs purposes, the written description of the requested scope of this investigation is dispositive.[11]

Ferrovanadium is a source of vanadium that is added to molten steel to enhance the strength and wear resistance of certain construction alloy steels, rail steels, high-speed and heat-resisting tool and die steels, and high strength low-alloy ("HSLA") steels, often called microalloy steels. Microalloy steels are used in pipelines, concrete reinforcing bars, structural shapes and plate for construction, and in automobile components. Steelmaking is the largest use of vanadium and accounts for almost all vanadium consumption worldwide.[12]

Ferrovanadium is commonly produced in grades having a vanadium content of 40–60 percent or 75–85 percent. Regardless of grade, commercial practice is to quote the price of ferrovanadium on the basis of the contained vanadium.[13]

C. Analysis

In our preliminary determination, we defined a single domestic like product consisting of the ferrovanadium products corresponding to the investigation's scope. We found that

> all grades of ferrovanadium have similar physical characteristics and are generally used as an alloy in the production of steel. Although some purchasers preferred a particular grade of ferrovanadium, the record indicated that all grades of ferrovanadium are interchangeable. Whereas the two domestic

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(…Continued)
United States, 688 F. Supp. 639, 644 (Ct. Int'l Trade 1988), *aff'd*, 865 F.3d 240 (Fed. Cir.), *cert. denied*, 492 U.S. 919 (1989).

[10] *Hosiden Corp. v. Advanced Display Mfrs.*, 85 F.3d 1561, 1568 (Fed. Cir. 1996) (the Commission may find a single like product corresponding to several different classes or kinds defined by Commerce); *Cleo*, 501 F.3d at 1298 n.1 ("Commerce's {scope} finding does not control the Commission's {like product} determination."); *Torrington*, 747 F. Supp. at 748-52 (affirming the Commission's determination defining six like products in investigations in which Commerce found five classes or kinds).

[11] 82 Fed. Reg. 14874, 14875 (Mar. 23, 2017) (final determ.).

[12] CR at I-12, PR at I-8.

[13] CR at I-11-12, PR at I-8.

> producers utilized different production processes, both reported the capability to manufacture other grades of ferrovanadium. Ferrovanadium is primarily sold to steel manufacturers and priced based on the contained vanadium content. [14]

There is no new information in the final phase of this investigation about the characteristics of ferrovanadium different from that in our preliminary determination.[15] No party argued that the Commission should define a different domestic like product.[16] Therefore, for the reasons set forth in our preliminary determination, we define a single domestic like product corresponding to Commerce's scope.

III. Domestic Industry

The domestic industry is defined as the domestic "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[17] In defining the domestic industry, the Commission's general practice has been to include in the industry producers of all domestic production of the like product, whether toll-produced, captively consumed, or sold in the domestic merchant market.

In our preliminary determination, we defined the domestic industry as the domestic producers of ferrovanadium, which in this case would encompass Bear (a U.S. toll-producer of ferrovanadium) and AMG (a U.S. firm that manufactures ferrovanadium for sale to unrelated third-party customers).[18] No party argued for a different definition of the domestic industry in the final phase of this investigation.[19]

We continue not to include tollees in the domestic industry. Tollees such as Evraz Stratcor, Gulf, Glencore, and Traxys supply vanadium pentoxide to Bear, retain title to the product during Bear's conversion operations, and negotiate the sale of the resulting ferrovanadium.[20] Since these tollees do not manufacture ferrovanadium,[21] they are not domestic producers of the domestic like product under the statute, and we do not include them in the domestic industry.

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[14] *Ferrovanadium from Korea*, Inv. No. 731-TA-1315 (Preliminary), USITC Pub. 4611 at 7-9 (May 2016) ("Preliminary Determination").

[15] *See generally* CR at I-11-16, PR at I-8-11.

[16] Petitioners contend that the Commission should define a single domestic like product coextensive with the scope of the investigation. Petitioners' Posthearing Brief at 1-4. Korvan did not address the issue.

[17] 19 U.S.C. § 1677(4)(A).

[18] Preliminary Determination, USITC Pub. 4611 at 9.

[19] Petitioners' Posthearing Br. at 2-3. Respondent Korvan did not address the definition of the domestic industry.

[20] CR at III-1-2, PR at III-1

[21] CR/PR at Table III-1, Table III-2.

No domestic party is a related party in this investigation.[22] Consequently, we define the domestic industry as consisting of all domestic producers of ferrovanadium (*i.e.*, Bear and AMG).

IV. Material Injury by Reason of Subject Imports

Based on the record in the final phase of this investigation, we find that an industry in the United States is materially injured by reason of imports of ferrovanadium from Korea that Commerce has found to be sold in the United States at less than fair value.[23]

A. Legal Standards

In the final phase of antidumping and countervailing duty investigations, the Commission determines whether an industry in the United States is materially injured or threatened with material injury by reason of the imports under investigation.[24] In making this determination, the Commission must consider the volume of subject imports, their effect on prices for the domestic like product, and their impact on domestic producers of the domestic

[22] The record does not indicate that any domestic producer is related to an exporter or importer of subject merchandise, or is itself an importer of subject merchandise. *** of Bear's tollees imported subject merchandise, but *** qualifies as a domestic producer. CR/PR at Table III-10. These tollees, ***, are separate corporate entities that are unrelated to Bear. CR/PR at Table III-3. Consequently, we conclude that these imports do not provide a basis to find Bear to be a related party.

The Commission has previously concluded that a producer that purchases subject merchandise may be treated as a related party if it controls large volumes of subject imports. The Commission has found such control to exist when the domestic producer was responsible for a predominant proportion of an importer's purchases and these purchases were substantial. *See Iron Construction Castings from Brazil, Canada, and China,* Inv. Nos. 701-TA-249, 731-TA-262, 263, and 265 (Fourth Review), USITC Pub. 4655 at 11 (Dec. 2016). During the period of investigation, domestic producer *** purchased ferrovanadium from Korea through U.S. importer ***. CR at III-17 and Tables III-12, IV-2, PR at III-12 and Tables III-12, IV-2; *** Importers Questionnaire Response, EDIS Doc. 606914. Because the record indicates that *** is not responsible for a predominant portion of the importer's imports, this firm is not a related party.

[23] Pursuant to section 771(24) of the Tariff Act, imports from a subject country of merchandise corresponding to the domestic like product that account for less than 3 percent of all such merchandise imported into the United States in the most recent 12-month period for which data are available preceding the filing of the petition shall be deemed negligible. 19 U.S.C. § 1677(24)(A)(i). Negligibility is not an issue in this investigation. Subject imports from Korea accounted for *** percent of the quantity of total ferrovanadium imports into the United States from March 2015 to February 2016, the 12-month period that precedes the filing of the petition. CR at IV-14, PR at IV-10.

[24] 19 U.S.C. §§ 1671d(b), 1673d(b). The Trade Preferences Extension Act of 2015, Pub. L. 114-27, amended the provisions of the Tariff Act pertaining to Commission determinations of material injury and threat of material injury by reason of subject imports in certain respects. We have applied these amendments here.

like product, but only in the context of U.S. production operations.[25] The statute defines "material injury" as "harm which is not inconsequential, immaterial, or unimportant."[26] In assessing whether the domestic industry is materially injured by reason of subject imports, we consider all relevant economic factors that bear on the state of the industry in the United States.[27] No single factor is dispositive, and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[28]

Although the statute requires the Commission to determine whether the domestic industry is "materially injured or threatened with material injury by reason of" unfairly traded imports,[29] it does not define the phrase "by reason of," indicating that this aspect of the injury analysis is left to the Commission's reasonable exercise of its discretion.[30] In identifying a causal link, if any, between subject imports and material injury to the domestic industry, the Commission examines the facts of record that relate to the significance of the volume and price effects of the subject imports and any impact of those imports on the condition of the domestic industry. This evaluation under the "by reason of" standard must ensure that subject imports are more than a minimal or tangential cause of injury and that there is a sufficient causal, not merely a temporal, nexus between subject imports and material injury.[31]

In many investigations, there are other economic factors at work, some or all of which may also be having adverse effects on the domestic industry. Such economic factors might include nonsubject imports; changes in technology, demand, or consumer tastes; competition among domestic producers; or management decisions by domestic producers. The legislative history explains that the Commission must examine factors other than subject imports to ensure that it is not attributing injury from other factors to the subject imports, thereby inflating an otherwise tangential cause of injury into one that satisfies the statutory material

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[25] 19 U.S.C. § 1677(7)(B). The Commission "may consider such other economic factors as are relevant to the determination" but shall "identify each {such} factor ... and explain in full its relevance to the determination." 19 U.S.C. § 1677(7)(B).

[26] 19 U.S.C. § 1677(7)(A).

[27] 19 U.S.C. § 1677(7)(C)(iii).

[28] 19 U.S.C. § 1677(7)(C)(iii).

[29] 19 U.S.C. §§ 1671d(a), 1673d(a).

[30] *Angus Chemical Co. v. United States*, 140 F.3d 1478, 1484-85 (Fed. Cir. 1998) ("{T}he statute does not 'compel the commissioners' to employ {a particular methodology}."), *aff'g,* 944 F. Supp. 943, 951 (Ct. Int'l Trade 1996).

[31] The Federal Circuit, in addressing the causation standard of the statute, observed that "{a}s long as its effects are not merely incidental, tangential, or trivial, the foreign product sold at less than fair value meets the causation requirement." *Nippon Steel Corp. v. USITC*, 345 F.3d 1379, 1384 (Fed. Cir. 2003). This was further ratified in *Mittal Steel Point Lisas Ltd. v. United States*, 542 F.3d 867, 873 (Fed. Cir. 2008), where the Federal Circuit, quoting *Gerald Metals, Inc. v. United States*, 132 F.3d 716, 722 (Fed. Cir. 1997), stated that "this court requires evidence in the record 'to show that the harm occurred "by reason of" the LTFV imports, not by reason of a minimal or tangential contribution to material harm caused by LTFV goods.'" *See also Nippon Steel Corp. v. United States*, 458 F.3d 1345, 1357 (Fed. Cir. 2006); *Taiwan Semiconductor Industry Ass'n v. USITC*, 266 F.3d 1339, 1345 (Fed. Cir. 2001).

injury threshold.[32] In performing its examination, however, the Commission need not isolate the injury caused by other factors from injury caused by unfairly traded imports.[33] Nor does the "by reason of" standard require that unfairly traded imports be the "principal" cause of injury or contemplate that injury from unfairly traded imports be weighed against other factors, such as nonsubject imports, which may be contributing to overall injury to an industry.[34] It is clear that the existence of injury caused by other factors does not compel a negative determination.[35]

Assessment of whether material injury to the domestic industry is "by reason of" subject imports "does not require the Commission to address the causation issue in any particular way" as long as "the injury to the domestic industry can reasonably be attributed to the subject imports" and the Commission "ensure{s} that it is not attributing injury from other sources to

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[32] Uruguay Round Agreements Act Statement of Administrative Action, H.R. Rep. 103-316, vol. I ("SAA") at 851-52 (1994) ("{T}he Commission must examine other factors to ensure that it is not attributing injury from other sources to the subject imports."); S. Rep. 96-249 at 75 (1979) (the Commission "will consider information which indicates that harm is caused by factors other than less-than-fair-value imports."); H.R. Rep. 96-317 at 47 (1979) ("in examining the overall injury being experienced by a domestic industry, the ITC will take into account evidence presented to it which demonstrates that the harm attributed by the petitioner to the subsidized or dumped imports is attributable to such other factors;" those factors include "the volume and prices of nonsubsidized imports or imports sold at fair value, contraction in demand or changes in patterns of consumption, trade restrictive practices of and competition between the foreign and domestic producers, developments in technology and the export performance and productivity of the domestic industry"); *accord Mittal Steel*, 542 F.3d at 877.

[33] SAA at 851-52 ("{T}he Commission need not isolate the injury caused by other factors from injury caused by unfair imports."); *Taiwan Semiconductor Industry Ass'n,* 266 F.3d at 1345 ("{T}he Commission need not isolate the injury caused by other factors from injury caused by unfair imports ... . Rather, the Commission must examine other factors to ensure that it is not attributing injury from other sources to the subject imports." (emphasis in original)); *Asociacion de Productores de Salmon y Trucha de Chile AG v. United States*, 180 F. Supp. 2d 1360, 1375 (Ct. Int'l Trade 2002) ("{t}he Commission is not required to isolate the effects of subject imports from other factors contributing to injury" or make "bright-line distinctions" between the effects of subject imports and other causes.); *see also Softwood Lumber from Canada*, Inv. Nos. 701-TA-414 and 731-TA-928 (Remand), USITC Pub. 3658 at 100-01 (Dec. 2003) (Commission recognized that "{i}f an alleged other factor is found not to have or threaten to have injurious effects to the domestic industry, *i.e*., it is not an 'other causal factor,' then there is nothing to further examine regarding attribution to injury"), *citing Gerald Metals,* 132 F.3d at 722 (the statute "does not suggest that an importer of LTFV goods can escape countervailing duties by finding some tangential or minor cause unrelated to the LTFV goods that contributed to the harmful effects on domestic market prices.").

[34] S. Rep. 96-249 at 74-75; H.R. Rep. 96-317 at 47.

[35] *See Nippon Steel Corp*., 345 F.3d at 1381 ("an affirmative material-injury determination under the statute requires no more than a substantial-factor showing. That is, the 'dumping' need not be the sole or principal cause of injury.").

the subject imports."[36] [37] Indeed, the Federal Circuit has examined and affirmed various Commission methodologies and has disavowed "rigid adherence to a specific formula."[38]

The Federal Circuit's decisions in *Gerald Metals, Bratsk*, and *Mittal Steel* all involved cases where the relevant "other factor" was the presence in the market of significant volumes of price-competitive nonsubject imports. The Commission interpreted the Federal Circuit's guidance in *Bratsk* as requiring it to apply a particular additional methodology following its finding of material injury in cases involving commodity products and a significant market presence of price-competitive nonsubject imports.[39] The additional "replacement/benefit" test looked at whether nonsubject imports might have replaced subject imports without any benefit to the U.S. industry. The Commission applied that specific additional test in subsequent cases, including the *Carbon and Certain Alloy Steel Wire Rod from Trinidad and Tobago* determination that underlies the *Mittal Steel* litigation.

Mittal Steel clarifies that the Commission's interpretation of *Bratsk* was too rigid and makes clear that the Federal Circuit does not require the Commission to apply an additional test nor any one specific methodology; instead, the court requires the Commission to have "evidence in the record" to "show that the harm occurred 'by reason of' the LTFV imports," and requires that the Commission not attribute injury from nonsubject imports or other factors to

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[36] *Mittal Steel*, 542 F.3d at 877-78; *see also id.* at 873 ("While the Commission may not enter an affirmative determination unless it finds that a domestic industry is materially injured 'by reason of' subject imports, the Commission is not required to follow a single methodology for making that determination ... {and has} broad discretion with respect to its choice of methodology.") *citing United States Steel Group v. United States*, 96 F.3d 1352, 1362 (Fed. Cir. 1996) and S. Rep. 96-249 at 75. In its decision in *Swiff-Train v. United States*, 793 F.3d 1355 (Fed. Cir. 2015), the Federal Circuit affirmed the Commission's causation analysis as comporting with the Court's guidance in *Mittal*.

[37] Commissioner Kieff does not join this paragraph or the following three paragraphs. He points out that the Federal Circuit, in *Bratsk*, 444 F.3d 1369, and *Mittal Steel*, held that the Commission is *required*, in certain circumstances when analyzing present material injury, to consider a particular issue with respect to the role of nonsubject imports, without reliance upon presumptions or rigid formulas. The Court has not prescribed a specific method of exposition for this consideration. *Mittal Steel* explains as follows:

> What *Bratsk* held is that "where commodity products are at issue and fairly traded, price competitive, non-subject imports are in the market," the Commission would not fulfill its obligation to consider an important aspect of the problem if it failed to consider whether non-subject or non-LTFV imports would have replaced LTFV subject imports during the period of investigation without a continuing benefit to the domestic industry. 444 F.3d at 1369. Under those circumstances, *Bratsk* requires the Commission to consider whether replacement of the LTFV subject imports might have occurred during the period of investigation, and it requires the Commission to provide an explanation of its conclusion with respect to that factor.

542 F.3d at 878.

[38] *Nucor Corp. v. United States*, 414 F.3d 1331, 1336, 1341 (Fed. Cir. 2005); *see also Mittal Steel*, 542 F.3d at 879 ("*Bratsk* did not read into the antidumping statute a Procrustean formula for determining whether a domestic injury was 'by reason' of subject imports.").

[39] *Mittal Steel*, 542 F.3d at 875-79.

subject imports.[40] Accordingly, we do not consider ourselves required to apply the replacement/benefit test that was included in Commission opinions subsequent to *Bratsk*.

The progression of *Gerald Metals, Bratsk*, and *Mittal Steel* clarifies that, in cases involving commodity products where price-competitive nonsubject imports are a significant factor in the U.S. market, the Court will require the Commission to give full consideration, with adequate explanation, to non-attribution issues when it performs its causation analysis.[41]

The question of whether the material injury threshold for subject imports is satisfied notwithstanding any injury from other factors is factual, subject to review under the substantial evidence standard.[42] Congress has delegated this factual finding to the Commission because of the agency's institutional expertise in resolving injury issues.[43]

B. Conditions of Competition and the Business Cycle

The following conditions of competition inform our analysis of whether there is material injury by reason of subject imports.

1. Demand Considerations

Ferrovanadium is used almost exclusively by the steel industry.[44] As discussed above, steelmakers utilize ferrovanadium as an alloying agent when producing certain types of steel, particularly HSLA steel.[45] Consequently, demand for ferrovanadium is derived from demand for the steel products in which it is used.[46] There are few economically viable substitutes for ferrovanadium.[47]

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[40] *Mittal Steel*, 542 F.3d at 873 (quoting from *Gerald Metals*, 132 F.3d at 722), 875-79 & n.2 (recognizing the Commission's alternative interpretation of *Bratsk* as a reminder to conduct a non-attribution analysis).

[41] To that end, after the Federal Circuit issued its decision in *Bratsk*, the Commission began to present published information or send out information requests in the final phase of investigations to producers in nonsubject countries that accounted for substantial shares of U.S. imports of subject merchandise (if, in fact, there were large nonsubject import suppliers). In order to provide a more complete record for the Commission's causation analysis, these requests typically seek information on capacity, production, and shipments of the product under investigation in the major source countries that export to the United States.

[42] We provide in our discussion below a full analysis of other factors alleged to have caused any material injury experienced by the domestic industry.

[43] *Mittal Steel*, 542 F.3d at 873; *Nippon Steel Corp*., 458 F.3d at 1350, *citing U.S. Steel Group*, 96 F.3d at 1357; S. Rep. 96-249 at 75 ("The determination of the ITC with respect to causation is ... complex and difficult, and is a matter for the judgment of the ITC.").

[44] CR at II-11, PR at II-7.

[45] CR at II-11, PR at II-7. Petitioners' Prehearing Brief at 9; Petitioners' Postconf. Brief at 5; Confer. Tr. at 32 (Lutz); Petitions, Vol. I at 8-9.

[46] CR at II-11-13, PR at II-7-9; Petitioners' Posthearing Brief at 3; Petitioners' Prehearing Brief at 9; Petitioners' Postconf. Brief at 5; Confer. Tr. at 9 (Totaro); Petitions, Vol. I at 22.

[47] CR at II-10, II-26, PR at II-7, II-18; Petitioners' Posthearing Brief at 3.

A majority of U.S. producers/tollees and a plurality of importers reported a decrease in U.S. demand for ferrovanadium since January 2013, while the majority of purchasers reported that demand had fluctuated.[48] Those firms that reported a decrease in demand generally identified a decrease in demand for and/or U.S. production of steel as the reason.[49] Between January 2013 and September 2016, overall steel production in the United States, measured on a monthly basis, decreased by 16.0 percent.[50] Apparent U.S. consumption of ferrovanadium by quantity of contained vanadium increased from *** pounds in 2013 to *** pounds in 2014 but decreased to *** pounds in 2015.[51]

2. Supply Considerations

AMG and Bear account for all domestic production of ferrovanadium.[52] AMG utilizes spent catalysts and petroleum combustion residues to manufacture ferrovanadium for sale to unrelated third-party customers.[53] Bear toll processes ferrovanadium from vanadium pentoxide supplied by its former corporate parent Gulf and other firms.[54] According to petitioners, ferrovanadium production is highly capital intensive and involves high fixed costs.[55]

In June 2016, Gulf, which then owned Bear and was its *** tollee, filed for Chapter 11 bankruptcy protection with the goal of finding a buyer. In October 2016, Gulf sold Bear to Yilmaden Holding A.S., a Turkish ferro metals company. According to Petitioners, Gulf is still producing vanadium pentoxide while looking for a buyer. Gulf has announced plans to idle its facility if no buyer is found.[56]

Bear's tollee *** is an importer of ferrovanadium from nonsubject countries, and a manufacturer of vanadium pentoxide, as well as various vanadium chemicals.[57] During the period of investigation, *** transferred some of the vanadium pentoxide to Bear for tolling into ferrovanadium.[58] Other Bear tollees include ***.[59]

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[48] CR at II-14, PR at II-9; CR/PR at Table II-3.

[49] CR at II-14, PR at II-9.

[50] CR at II-11, PR at II-7.

[51] Apparent U.S. consumption was *** pounds in January-September ("interim") 2015 and *** pounds in interim 2016. CR/PR at Table IV-6.

[52] CR at III-6-7, PR at III-4-5; Petitioners' Prehearing Brief at 5; Petitions, Vol. I at 3.

[53] CR at I-14, PR at I-10.

[54] CR at I-13-14, PR at I-9-10; Petitioners' Postconf. Brief at 5; Confer. Tr. at 27 (Carey); Petitions, Vol. I at 11, 21.

[55] Hearing Tr. at 20 (Anderson); Confer. Tr. at 23 (Anderson).

[56] CR at III-3-4, PR at I-3, III-3; Hearing Tr. at 46 (Totaro).

[57] CR at I-15-16, IV-1, PR at I-10-11, IV-1.

[58] CR at I-15, PR at I-11.

[59] *** is a trading company handling metals, alloys, and other raw materials and ***. CR at I-16, PR at I-11; ***'s producer questionnaire response, section II-4. ***, retrieved February 27, 2017. The company produces ***. CR at I-16, PR at I-11; *** producer questionnaire response, section I-2. *** is both a trader and a producer of vanadium pentoxide that ***. CR at I-16, PR at I-11; ***'s producer questionnaire response, section II-4. ***. CR at I-16, PR at I-11; *** producer questionnaire response, (Continued...)

The domestic industry was the largest supplier to the U.S. market during the period of investigation. It accounted for *** percent of apparent U.S. consumption in 2013, *** percent in 2014, and *** percent in 2015.[60]

With respect to subject imports, Korvan and Woojin account for all or virtually all production in Korea of the ferrovanadium exported to the United States.[61] Both Korvan and Woojin convert vanadium pentoxide, imported primarily from China, into ferrovanadium.[62] Subject imports accounted for *** percent of apparent U.S. consumption in 2013, *** percent in 2014, and *** percent in 2015.[63]

The majority of ferrovanadium imports from nonsubject countries during the period of investigation originated from the Czech Republic, Austria, and Canada, and each of these countries has a single producer.[64] The tollee *** accounted for *** percent of nonsubject imports over the period of investigation.[65] Nonsubject imports accounted for *** percent of apparent U.S. consumption in 2013, *** percent in 2014, and *** percent in 2015.[66] The United States issued antidumping duty orders on ferrovanadium imports from China and South Africa in January 2003, and those orders remain in effect.[67]

3. Substitutability and Other Conditions

Ferrovanadium is sold in two grades that differ in terms of the percentage of contained vanadium (*i.e.*, 40-60 percent or 75-85 percent).[68] Although both grades are chemically interchangeable, some users prefer ferrovanadium with a lower vanadium content that melts into the steel bath more easily, and others prefer ferrovanadium with a higher vanadium

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(…Continued)
section II-4. *** is a trading company and ***. CR at I-16, PR at I-11; *** producer questionnaire response, section II-4.

[60] CR/PR at Table IV-6. The domestic industry accounted for *** percent of apparent U.S. consumption in interim 2015 and *** percent in interim 2016. *Id.*

[61] CR at VII-3, PR at VII-3.

[62] CR at VII-4, PR at VII-4; *Ferrovanadium from China and South Africa,* Inv. Nos. 731-TA-986-987 (Second Review), USITC Pub. 5417 at IV-16 (January 2015).

[63] CR/PR at Table IV-5. Subject imports accounted for *** percent of apparent U.S. consumption in interim 2015 and *** percent in interim 2016. *Id.*

[64] CR/PR at Table IV-2, VII-12, 15, 17, PR at Table IV-2, VII-10, 13, 15.

[65] CR/PR at Tables III-10 and IV-2. The parent of Bear's tollee Evraz Stratcor (Evraz plc) owns Evraz Nikom, which manufactures ferrovanadium in the Czech Republic from vanadium pentoxide produced by Evraz Vanady Tula, a ferrovanadium producer in Russia that obtains its steel slag from Evraz NTMK, a steel producer in Russia. CR at VII-17, PR at VII-15.

[66] CR/PR at Table IV-5. Nonsubject imports accounted for *** percent of apparent U.S. consumption in interim 2015 and *** percent in interim 2016. *Id.*

[67] CR at I-8-9, PR at I-5-6; *see also* 80 Fed. Reg. 8607 (Feb. 18, 2015) (continuation of antidumping duty orders).

[68] CR at I-11, PR at I-8.

content and lower share of non-vanadium elements.[69] Most steelmakers will accept any grade because they possess the technical capability to adjust their steelmaking processes to accommodate different grades of ferrovanadium.[70]

Approximately *** percent of U.S. ferrovanadium production in 2015 was of ferrovanadium with 40 to 60 percent contained vanadium, and *** percent was of ferrovanadium with 75 to 85 percent contained vanadium.[71] U.S. importers of subject merchandise reported that *** percent of their imports from Korea in 2015 were of ferrovanadium with 75 to 85 percent contained vanadium and *** percent was of ferrovanadium with 40 to 60 percent contained vanadium.[72]

Most U.S. producers, tollees, and importers reported that domestically produced ferrovanadium was "always" interchangeable with ferrovanadium manufactured in Korea.[73] Most purchasers reported that the domestic like product and subject imports were either "always" or "frequently" interchangeable.[74] Majorities or pluralities of purchasers considered the domestic like product and subject imports from Korea comparable in each of 16 purchasing factors.[75] All 28 responding purchasers identified price as a very important purchasing factor,[76] and price was ranked first or second in importance more often than any other factor in purchasing decisions.[77] The vast majority of purchasers (24 of 27) reported that they usually or always purchase the lowest-priced product.[78]

We consequently find that there is a high degree of substitutability between domestically produced vanadium and ferrovanadium imported from Korea, and that price is an important factor in purchasing decisions.

Regardless of grade, the commercial practice in the U.S. market is to quote the price of ferrovanadium on the basis of the contained vanadium.[79] The majority of questionnaire

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[69] CR at I-11-12, PR at I-8-9; Confer. Tr. at 18-19 (Neal). Petitioners note that the statements made by several U.S. purchasers in their final phase questionnaire responses indicate that while grade may be an important purchasing consideration, end users are able to substitute ferrovanadium of different grades. Petitioners' Prehearing Brief at 13.

[70] Petitioners' Prehearing Brief at 13; Hearing Tr. at 48-49 (Anderson); Confer. Tr. at 18 (Neal).

[71] Domestic producer AMG manufactures ferrovanadium with 40 to 60 percent contained vanadium and Bear manufactures ferrovanadium with 75 to 85 percent contained vanadium, but both have the ability to modify their production processes to alter the vanadium content. CR/PR at Table III-7; CR at III-9, PR at III-7; Petitioners' Postconf. Brief at 2; Confer. Tr. at 17-18 (Neal); Petition, Vol. I at 4, 9-10.

[72] CR/PR at Table IV-5.

[73] CR/PR at Table II-9 (indicating that each of the six responding U.S. producers/tollees and 17 of 18 responding U.S. importers reported that ferrovanadium produced in the United States is always or frequently interchangeable with ferrovanadium imported from Korea).

[74] CR/PR at Table II-9.

[75] CR/PR at Table II-8.

[76] CR/PR at Table II-6.

[77] CR/PR at Table II-5.

[78] CR at II-18, PR at II-12.

[79] CR at I-12, PR at I-8.

respondents reported mainly using transaction-by-transaction negotiations to set prices.[80] Most U.S. producers and tollees reported that ferrovanadium prices are indexed to published market prices, with the large majority of responding U.S. producers, tollees, and importers reporting using *CRU Ryan's Notes* to set ferrovanadium prices.[81] *Ryan's Notes* collects spot market pricing data from twice-weekly market assessment calls, and its published prices are used as benchmarks for spot market sales and contracts in the U.S. market.[82] In 2015, *** percent of the U.S. producers/tollees' U.S. shipments involved annual contracts, *** percent involved long-term contracts, *** percent involved short-term contracts, and *** percent involved spot sales; *** percent of U.S. importers' U.S. shipments of subject imports from Korea involved annual contracts, *** percent involved long-term contracts, *** percent involved short-term contracts, and *** percent involved spot sales; *** percent of U.S. importers' U.S. shipments of nonsubject imports involved annual contracts, *** percent involved long-term contracts, *** percent involved short-term contracts, and *** percent involved spot sales.[83]

The primary inputs used in production of ferrovanadium in the United States are spent catalysts from oil refineries and residuals from combustion of fuel oil, which are either processed into vanadium pentoxide (which can be further processed to produce ferrovanadium) or are processed directly into ferrovanadium and other products.[84] Vanadium pentoxide also is imported into the United States for toll conversion into ferrovanadium. As discussed above, AMG produces ferrovanadium primarily using spent catalysts, whereas Bear converts vanadium pentoxide into ferrovanadium via an aluminothermic process.[85] Similar to Bear, Korean producers Korvan and Woojin convert vanadium pentoxide, imported primarily from China, into ferrovanadium.[86]

C. Volume of Subject Imports

Section 771(7)(C)(i) of the Tariff Act provides that the "Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States, is significant."[87]

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[80] CR/PR at Table V-1 (nine U.S. producers/tollees and 18 U.S. importers reported using transaction-by-transaction negotiations, four U.S. producers/tollees and eight U.S. importers reported using contracts, and one U.S. importer reported using a set price list).

[81] CR at V-10, PR at V-6.

[82] CR at V-10, PR at V-6.

[83] CR/PR at Table V-2; *see also* Petitioners' Postconf. Brief at 16-17, Answer to Question 4, Question 19; Confer. Tr. at 10 (Totaro), 19 (Neal), 44-45 (Anderson, Valdes). Korvan has "from time to time sought long-term contracts with the buyers of its product," but "at least in recent months has been forced to {rely on} spot sales." Confer. Tr. at 82 (Maberry).

[84] CR at V-1, PR at V-1.

[85] Hearing transcript, pp. 13 (Anderson), 23-24 (Carey).

[86] CR at V-1, VII-4–VII-5, PR at V-1, VII-4.

[87] 19 U.S.C. § 1677(7)(C)(i).

The quantity of subject imports from Korea increased each year from 2013 to 2015. Subject import volume increased from 784,000 pounds contained vanadium in 2013 to 1.2 million pounds contained vanadium in 2014 and 1.6 million pounds contained vanadium in 2015, a level 105.6 percent higher than in 2013.[88] Subject import volume increased by 29.6 percent from 2014 to 2015, even as apparent U.S. consumption *** by *** percent over the same period.[89] As a share of apparent U.S. consumption, subject imports increased from *** percent in 2013 to *** percent in 2014 and *** percent in 2015, a level *** percentage points higher than in 2013.[90]

In light of the foregoing, we find that the volume of subject imports and the increase in that volume are significant in both absolute terms and relative to domestic consumption.

D. Price Effects of the Subject Imports

Section 771(7)(C)(ii) of the Tariff Act provides that, in evaluating the price effects of the subject imports, the Commission shall consider whether

> (I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and
>
> (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.[91]

As stated above, the current record indicates a high degree of substitutability between subject imports from Korea and the domestic like product and that price is an important consideration in purchasing decisions in the U.S. market.

The Commission collected quarterly sales price data for two products reflecting the two grades of ferrovanadium shipped to unrelated U.S. customers during the POI.[92] Nine U.S. producers/tollees and ten importers submitted usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters.[93] The pricing

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[88] CR/PR at Table IV-6. In interim 2016, subject imports were 532,000 pounds contained vanadium, down from 1.2 million pounds contained vanadium in interim 2015. CR/PR at Table IV-6. We find that the lower volume and market share for subject imports in interim 2016 as compared to interim 2015 was a result of the filing of the petitions on March 28, 2016. We therefore reduce the weight we accord to the volume, price effects, and impact of subject imports for interim 2016, pursuant to 19 U.S.C. § 1677(7)(I).

[89] CR/PR at Table C-1.

[90] CR/PR at Table IV-6. Subject import market share was *** percent in interim 2016, down from *** percent in interim 2015. CR/PR at Table IV-6.

[91] 19 U.S.C. § 1677(7)(C)(ii).

[92] The pricing products are (1) ferrovanadium containing 40 to 60 percent contained vanadium, 2" by down and (2) ferrovanadium containing 75 to 85 percent contained vanadium, 2" by down. CR at V-14; PR at V-8.

[93] CR at V-14; PR at V-8.

data collected from these firms accounted for approximately 89.2 percent of U.S. producers/tollees' shipments of ferrovanadium and 98.6 percent of U.S. shipments of subject imports from Korea in 2015.[94] The U.S. producers/tollees reported pricing data for both products.[95] U.S. importers of subject merchandise from Korea reported pricing data ***.[96]

The available pricing comparisons indicate that subject imports from Korea undersold the domestic like product in ten of 14 possible quarterly comparisons (accounting for *** pounds contained vanadium of subject imports) at underselling margins that ranged from less than 0.05 to 16.7 percent, and oversold it in the remaining four comparisons (accounting for *** pounds contained vanadium of subject imports) at overselling margins that ranged from 0.4 to 36.6 percent.[97] [98]

Petitioners ask the Commission to focus on the end of the period given their contention that the negative price effects of subject imports from Korea manifested themselves during 2015.[99] The data for this period show a mixed pattern of underselling and overselling. In the six full quarters of the period leading up to the filing of the petition in March 2016 (*i.e.*, October-December 2014 through January-March 2016, three price comparisons involved underselling by subject imports from Korea at margins of *** percent, *** percent, and *** percent (accounting for *** pounds contained vanadium of subject imports), and the other three comparisons involved overselling at margins of *** percent, *** percent, and *** percent (accounting for *** pounds contained vanadium of subject imports).[100]

We have also examined price trends. In general, prices for ferrovanadium decreased during the period of investigation.[101] Prices for the domestically produced product fell by *** percent for product 1 and *** percent for product 2 during January 2013 to September 2016. The price decline was particularly severe during the period leading up to the filing of the petition with prices for the domestically produced product falling by over *** percent overall between the fourth quarter of 2014 and the first quarter of 2016.[102] Prices for subject imported *** fell by *** percent from the first quarter of 2013 to the second quarter of June 2016 and by *** percent in the six full quarters leading up to the filing of the petition.[103]

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[94] CR at V-14; PR at V-8.

[95] CR/PR at Tables V-3 and V-4.

[96] CR/PR at Tables V-3 and V-4.

[97] CR at V-20; PR at V-12; CR/PR at Table V-3, Table V-4, Table V-6.

[98] Respondent Korvan contends that the record evidence showed that in most instances the prices for subject imports were above the prices for domestic ferrovanadium, with overselling margins as high as *** percent. Respondent's Posthearing Brief at 6. Korvan's arguments, however, are based on data contained in the prehearing report that were subsequently revised in the final report.

[99] Petitioners' Prehearing Brief at 18.

[100] CR/PR at Table V-4. Chairman Schmidtlein and Commissioner Williamson find the underselling observed during the period of investigation to be significant.

[101] CR/PR at Table V-3, Table V-4.

[102] CR/PR at Table V-3, Table V-4.

[103] CR/PR at Table V-5. The second quarter of 2016 is the latest for which pricing data for this imported product are available.

As discussed above, most sales of ferrovanadium by the domestic producers and the tollees were made pursuant to annual or long-term contracts that traditionally contain provisions that set prices based on formulas that provide a discount off of the spot market prices published by *CRU Ryan's Notes* and other sources.[104] Petitioners assert that prices in their contracts adjust monthly based on the prior month's published *CRU Ryan's Notes* spot prices; most responding purchasers indicated that spot prices affect contract prices.[105] Imports from Korea played a significant role in the spot market, with more than *** percent of subject import sales transactions in 2015 being spot sales.[106]

The increasing volume of subject imports at declining prices during the last quarter of 2014 and in 2015, at a time when apparent U.S. consumption was declining, pushed down prices in the spot market as reflected in the prices published by *CRU Ryan's Notes* and others. Petitioners observe that published U.S. spot market prices for ferrovanadium were adjusted downward on 25 separate occasions in 2015, and the published monthly average price for ferrovanadium in December 2015 was less than half of the corresponding price in December 2014.[107] [108] The declining published prices, in turn, drove formula contract prices down for the domestic like product.[109]

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[104] CR at V-4-11, PR at V-3-7; Petitioners' Prehearing brief at 28-29; Petitioners' Postconf. Brief at Answer to Question 3; Confer. Tr. at 35-36 (Lutz).

[105] Petitioners' Prehearing Brief at 24-25; CR at V-9; PR at V-5.

[106] CR/PR at Table V-2. We note that there were also substantial volumes of domestically produced ferrovanadium and nonsubject imports sold to the spot market over the POI. CR/PR at Table V-2.

[107] Petitioners' Prehearing Brief at 30 (citing Petition, Vol. I at Exhibit I-12 (*CRU Ryan's Notes Prices*)); Petitioners' Postconf. Brief at 16.

[108] As further evidence that subject imports from Korea depressed prices in the U.S. market, petitioners point to three affidavits in the petition that they argue demonstrate how sales of low-priced imports of ferrovanadium from Korea resulted in three instances of price declines between September and December 2015 and a fourth exhibit that purports to demonstrate that spot sales of subject imports again caused a price decline in July 2016. Petitioners' Prehearing Brief at 31-33, Exhibit 9, Exhibit 11; Petitioners' Postconf. Brief at 16-19, Answer to Question 3; Petition, Vol. I at Exhibit I-13. We note that these affidavits discuss occasions on which ***.

[109] Seven of the 28 purchasers responding to the purchaser questionnaire reported that they had purchased imported ferrovanadium from Korea instead of U.S.-produced product since 2013. Two of these purchasers reported that subject import prices were lower than U.S.-produced product, and these same purchasers reported that price was a primary reason for the decision to purchase imported Korean product rather than U.S.-produced product. The reported estimated quantity these firms purchased from subject imports sources rather than domestic sources totaled 155,471 pounds. Four of five responding purchasers identified availability as the main non-price reasons for purchasing imported rather than U.S.-produced ferrovanadium.

Of the responding purchasers, seven reported that U.S. producers/tollees had not reduced prices in order to compete with lower-priced imports from subject countries; 20 reported that they did not know whether such price reductions had occurred. No purchasers reported that U.S. producers/tollees had reduced prices in order to compete with lower-priced imports. CR at V-21-22/PR at V-12-13. Petitioners contend that because purchasers source most domestic ferrovanadium on a (Continued...)

We have considered other factors that may have led to declining U.S. ferrovanadium prices. During the period leading up to the filing of the petition, the published price of ferrovanadium decreased by $*** per pound contained vanadium, while the price of the raw material vanadium pentoxide decreased by a lesser $*** per pound contained vanadium.[110] Therefore, declines in raw material prices cannot explain the magnitude of the price declines that the domestic industry experienced during 2015.

We also examined the effect that the decline in U.S. steel production and the consequent declining demand for ferrovanadium may have had on the prices for ferrovanadium in the U.S. market. Between 2014 and 2015 the decline in steel production was 10.6 percent, on an annual basis.[111] Apparent U.S. consumption of ferrovanadium by quantity of contained vanadium decreased from *** pounds in 2014 to *** pounds in 2015, a decrease of *** percent.[112] Neither demand trend can fully explain the magnitude of the declines in domestic prices in 2015.

Further, we considered the effect of nonsubject imports on the prices for the domestically produced product. The volume and market share of nonsubject imports fell from 2013 to 2015 with the greater decline occurring from 2014 to 2015.[113] Moreover, available pricing data on nonsubject imports of pricing product 2 from Austria, Canada, and the Czech Republic indicate that, during the period from the fourth quarter of 2014 to the first quarter of 2016 nonsubject imports were priced higher than U.S.-produced product in 15 of 18 quarterly comparisons and higher than subject imports in 15 of 18 quarterly comparisons.[114] In addition, we note that *** due to the decline in published prices.[115] These volume and price data indicate that the pricing pressure placed on the domestic industry in 2015 was not a function of nonsubject imports.

Accordingly, based on the record in the final phase of this investigation, we find that the increasing and significant volume of subject imports sold at declining prices, particularly in

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(…Continued)
contract basis and any declines in the contract prices were tied to the published prices, not directly to spot sales, such purchasers would not necessarily know about the spot sales that caused the declines to the published price or their country of origin. Petitioners' Posthearing Brief at 15-16.

[110] EDIS Doc. No. 606923.

[111] Petitioners' Prehearing Brief at Exhibit 3.

[112] CR/PR at Table IV-6.

[113] Nonsubject imports totaled 7.4 million pounds contained vanadium in 2013, *** pounds contained vanadium in 2014, and *** pounds contained vanadium in 2015. CR/PR at Table C-1. Nonsubject imports totaled *** pounds contained vanadium in interim 2015 and *** pounds contained vanadium in interim 2016.

Nonsubject imports accounted for *** percent of apparent U.S. consumption in 2013, *** percent in 2014, and *** percent in 2015. CR/PR at Table C-1. Subject imports accounted for *** percent of apparent U.S. consumption in interim 2015 and *** percent in interim 2016. CR/PR at Table C-1.

[114] CR/PR at Tables V-4, D-2.

[115] Petitioners' Posthearing Brief at 13.

2015, had significant price-depressing effects on prices for the domestic like product. We therefore conclude that the subject imports had significant price effects.

E. Impact of the Subject Imports[116]

Section 771(7)(C)(iii) of the Tariff Act provides that examining the impact of subject imports, the Commission "shall evaluate all relevant economic factors which have a bearing on the state of the industry."[117] These factors include output, sales, inventories, capacity utilization, market share, employment, wages, productivity, gross profits, net profits, operating profits, cash flow, return on investment, return on capital, ability to raise capital, ability to service debts, research and development, and factors affecting domestic prices. No single factor is dispositive and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[118]

As apparent U.S. consumption of ferrovanadium increased between 2013 and 2014 and then declined between 2014 and 2015, the domestic industry's performance indicia were mixed,[119] with many of its production-related factors improving overall and most of its financial indicators declining over this period, particularly in 2015. In particular, the domestic industry's average production capacity increased from *** pounds contained vanadium in 2013 to *** pounds in 2014 and *** pounds in 2015, and its production increased from *** pounds

[116] The statute instructs the Commission to consider the "magnitude of the dumping margin" in an antidumping proceeding as part of its consideration of the impact of imports. 19 U.S.C. § 1677(7)(C)(iii)(V). In its final determination of sales at less value, Commerce found dumping margins of 3.22 to 52.69 percent. 82 Fed. Reg. 14874 (March 23, 2017) (Final Determ.). We take into account in our analysis the fact that the Department of Commerce has found that all subject producers are selling subject imports in the United States at less than fair value. In addition to this consideration, our impact analysis has also considered other factors affecting domestic prices. Our analysis of the significant price effects of the subject imports, described in both the price effects discussion and below, is particularly probative to an assessment of the impact of the subject imports.

[117] 19 U.S.C. § 1677(7)(C)(iii); *see also* SAA at 851 and 885 ("In material injury determinations, the Commission considers, in addition to imports, other factors that may be contributing to overall injury. While these factors, in some cases, may account for the injury to the domestic industry, they also may demonstrate that an industry is facing difficulties from a variety of sources and is vulnerable to dumped or subsidized imports.").

[118] 19 U.S.C. § 1677(7)(C)(iii). This provision was amended by the Trade Preferences Extension Act of 2015, Pub. L. 114-27.

[119] Under 19 U.S.C. § 1677(4) and 1677(7)(B)(i)(III), the Commission examines the impact of subject imports only on the U.S. operations producing the domestic like product. Thus, in this investigation, we focus on the impact of subject imports on the operations of domestic producers AMG and Bear. Our focus will be on the impact of subject imports on the domestic producers' operations rather than on the tollees' operations. We consider the data provided by the tollees to measure U.S. shipments, apparent U.S. consumption, inventories, and prices in order to understand better the functioning of the domestic industry and market. This is consistent with the Commission's approach in prior ferrovanadium proceedings. *See, e.g.*, Preliminary Determination, USITC 4611 at 9; USITC Pub. 4517 at 7, 28-29.

contained vanadium in 2013 to *** pounds in 2014 and *** pounds in 2015.[120] The domestic industry's capacity utilization increased from *** percent in 2013 to *** percent in 2014 and declined to *** percent in 2015.[121]

U.S. producers/tollees' U.S. shipments increased from *** pounds contained vanadium in 2013 to *** pounds in 2014 and decreased to *** pounds in 2015.[122] U.S. producers/tollees' market share increased from *** percent in 2013 to *** percent in 2014 and *** percent in 2015.[123] The ratio of end-of-period inventories to total shipments increased overall, declining from *** percent in 2013 to *** percent in 2014 and increasing to *** percent in 2015.[124]

Several employment-related factors increased. Production-related workers increased from *** employees in 2013 to *** employees in 2014 and *** employees in 2015.[125] Total hours worked increased from *** hours in 2013 to *** hours in 2014 and decreased to *** hours in 2015.[126] Hourly wages increased from $*** in 2013 to $*** in 2014 and $*** in 2015.[127] The domestic industry's productivity, measured in pounds contained vanadium per hour, increased from *** pounds in 2013 to *** pounds in 2014 and *** pounds in 2015.[128]

Profitability fell in the latter portion of the POI.[129] The domestic industry's net sales revenues increased from $*** in 2013 to $*** in 2014, but declined to $*** in 2015, when

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[120] CR/PR at Table III-5. Its production capacity was *** pounds contained vanadium in both interim 2015 and interim 2016. Its production was *** pounds contained vanadium in interim 2015 and lower, at *** pounds contained vanadium, in interim 2016.

[121] CR/PR at Table III-5. The industry's rate of capacity utilization was *** percent in interim 2016, down from *** percent in interim 2015.

[122] CR/PR at Table III-8. U.S. producers/tollees' U.S. shipments were *** pounds contained vanadium in interim 2015 and *** pounds contained vanadium in interim 2016.

[123] CR/PR at Table IV-6. U.S. producers/tollees' market share was *** percent in interim 2015 and *** percent in interim 2016.

[124] CR/PR at Table III-9. The ratio of end-of-period inventories to total shipments was *** percent in interim 2015 and higher, at *** percent, in interim 2016.

[125] CR/PR at Table III-13. Production-related workers totaled *** in interim 2015 and *** in interim 2016.

[126] CR/PR at Table III-13. Total hours worked was *** hours in interim 2015 and *** hours in interim 2016.

[127] CR/PR at Table III-13. Hourly wages were *** hours in interim 2015 and *** hours in interim 2016.

[128] CR at Table III-13. Productivity in pounds contained vanadium per hour was *** pounds in interim 2016, down from *** pounds in interim 2015.

[129] We note that *** reported revenues from sales of by-products of ferrovanadium production. CR/PR at Table VI-1; Petitioners' Posthearing brief at App. A, p. 33. We do not attribute the effects of changes in by-product revenues to subject import competition. The prices of by-products are the result of market forces external to the market for ferrovanadium.

We also collected financial data from the tollees. *See* CR/PR at Table VI-6 (presenting the consolidated ferrovanadium operations of AMG, Bear, and Bear's responding tollee firms). The trends for consolidated operations presented in Table VI-6 are substantially the same as those for domestic producers AMG and Bear, but tollees, selling in the commercial market reported large operating losses. We further note that in June 2016, Gulf, which then owned Bear filed for Chapter 11 bankruptcy (Continued...)

subject imports depressed the domestic industry's prices.[130] The cost of goods sold (COGS) increased less rapidly than sales revenues from 2013 to 2014, and increased from 2014 to 2015 when sales revenues declined. Consequently, the industry's ratio of COGS to net sales fell from *** percent in 2013 to *** percent in 2014 before increasing to *** percent in 2015.[131] Gross profit increased from *** in 2013 to *** in 2014, and then declined to *** in 2015, a level below that of 2013.[132] The domestic industry's operating income followed a similar trend, increasing from $*** in 2013 to $*** in 2014 and then falling to $*** in 2015.[133] The profitability decline was particularly evident in the fourth quarter of 2015, when the domestic industry recorded ***.[134] As a share of net sales, the domestic industry's operating income rose from *** percent in 2013 to *** percent in 2014, and declined to *** percent in 2015.[135] Similarly, the domestic industry's net income increased from $*** in 2013 to $*** in 2014 before falling to $*** in 2015.[136] The domestic industry's return on investment mirrored the trends of the operating income and net income ratios. Returns on investment rose from *** percent in 2013 to *** percent in 2014 and then fell to *** percent in 2015.[137]

Between 2013 and 2015, significant and increasing volumes of subject imports that were good substitutes for the domestic like product entered the U.S. market. These imports depressed prices for the domestic like product in 2015 as demand for ferrovanadium was declining. As a consequence, the domestic industry's revenues and financial performance were worse than they otherwise would have been in 2015. Accordingly, we find that subject imports from Korea had a significant impact on the domestic industry.

We have taken into account whether there were other factors that may have affected the domestic industry to ensure that we do not attribute injury from such other factors to subject imports. As explained above, the decline in raw material prices, the decline in U.S. steel production, and the declining demand for ferrovanadium cannot fully explain the magnitude of the declines in ferrovanadium domestic prices.

(…Continued)
protection. CR at III-3-4, PR at I-3, III-3; Hearing Tr. at 46 (Totaro). In October 2016, Gulf sold Bear to Yilmaden Holding A.S., a Turkish ferro metals company. *Id.*

[130] CR/PR at Table VI-1. Net sales value was $*** in interim 2015 and $*** in interim 2016. *Id*.

[131] CR/PR at Table VI-1. The industry's ratio of cost of goods sold to net sales was *** percent in interim 2016, down from *** percent in interim 2015. *Id*.

[132] CR/PR at Table VI-1. The domestic industry's gross profit was $*** in interim 2016, less than the $*** in interim 2015. *Id.*

[133] Operating income was $*** in interim 2016, down from $*** in interim 2015. CR/PR at Table VI-1.

[134] *See* CR/PR at Table VI-1.

[135] CR/PR at Table VI-1. Operating income was and *** percent in interim 2016, as compared to *** percent in interim 2015. *Id*.

[136] CR/PR at Table VI-1. Net income was $*** in interim 2016, as compared to $*** in interim 2015. *Id*.

[137] CR/PR at Table VI-4. The domestic industry's capital expenditures fell from 2013 to 2015. They were $*** in 2013, $*** in 2014, $*** in 2015, $*** in interim 2015, and $*** in interim 2016. The industry's research and development expenses were nominal. CR/PR at Table VI-3.

We have also examined the role of nonsubject imports. The record indicates that the volume and market share of nonsubject imports fell through the POI with the greatest decline occurring from 2014 to 2015.[138] Nonsubject imports were also generally priced higher than the domestic like product and subject imports.[139] Consequently, the observed declines in the domestic industry's revenues and financial performance cannot be explained by nonsubject imports.

V. Conclusion

For the reasons stated above, we determine that an industry in the United States is materially injured by reason of subject imports of ferrovanadium from Korea that are sold in the United States at less than fair value.

[138] CR/PR at Table C-1.
[139] CR/PR at D-3.

PART I: INTRODUCTION

BACKGROUND

This investigation results from petitions filed with the U.S. Department of Commerce ("Commerce") and the U.S. International Trade Commission ("USITC" or "Commission") by AMG Vanadium LLC ("AMG") of Cambridge, Ohio; Evergreen Metallurgical Company DBA Bear Metallurgical Company ("Bear") of Butler, Pennsylvania; Gulf Chemical and Metallurgical Corporation ("Gulf") of Freeport, Texas; and Evraz Stratcor, Inc. ("Evraz Stratcor") of Hot Springs, Arkansas, (collectively the Vanadium Producers and Reclaimers Association ("VPRA")), on March 28, 2016, alleging that an industry in the United States is materially injured and threatened with material injury by reason of less-than-fair-value ("LTFV") imports of ferrovanadium ("FeV")[1] from Korea. The following tabulation provides information relating to the background of this investigation.[2] [3]

Effective date	Action
March 28, 2016	Petition filed with Commerce and the Commission; institution of the Commission's investigation
April 18, 2016	Commerce's notice of initiation (81 FR 24059, April 25, 2016)
May 12, 2016	Commission's preliminary determination (81 FR 31254, May 18, 2016)
November 1, 2016	Commerce's preliminary determination (81 FR 75806)
November 1, 2016	Scheduling of final phase of Commission's investigation (81 FR 87590, December 5, 2016)
March 21, 2017	Commission's hearing
March 23, 2017	Commerce's final determination (82 FR 14874)
April 19, 2017	Commission's vote
May 8, 2017	Commission's views

[1] See the section entitled "The Subject Merchandise" in *Part I* of this report for a complete description of the merchandise subject to this investigation.

[2] Pertinent *Federal Register* notices are referenced in appendix A, and may be found at the Commission's website (www.usitc.gov).

[3] A list of witnesses appearing at the hearing is presented in appendix B of this report.

STATUTORY CRITERIA AND ORGANIZATION OF THE REPORT

Statutory criteria

Section 771(7)(B) of the Tariff Act of 1930 (the "Act") (19 U.S.C. § 1677(7)(B)) provides that in making its determinations of injury to an industry in the United States, the Commission--

> *shall consider (I) the volume of imports of the subject merchandise, (II) the effect of imports of that merchandise on prices in the United States for domestic like products, and (III) the impact of imports of such merchandise on domestic producers of domestic like products, but only in the context of production operations within the United States; and. . . may consider such other economic factors as are relevant to the determination regarding whether there is material injury by reason of imports.*

Section 771(7)(C) of the Act (19 U.S.C. § 1677(7)(C)) further provides that--[4]

> *In evaluating the volume of imports of merchandise, the Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States is significant.. . .In evaluating the effect of imports of such merchandise on prices, the Commission shall consider whether. . .(I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.. . . In examining the impact required to be considered under subparagraph (B)(i)(III), the Commission shall evaluate (within the context of the business cycle and conditions of competition that are distinctive to the affected industry) all relevant economic factors which have a bearing on the state of the industry in the United States, including, but not limited to. . . (I) actual and potential decline in output, sales, market share, gross profits, operating profits, net profits, ability to service debt, productivity, return on investments, return on assets, and utilization of capacity, (II) factors affecting domestic prices, (III) actual and potential negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment, (IV) actual and potential negative*

[4] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.

effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the domestic like product, and (V) in {an antidumping investigation}, the magnitude of the margin of dumping.

In addition, Section 771(7)(J) of the Act (19 U.S.C. § 1677(7)(J)) provides that—[5]

(J) EFFECT OF PROFITABILITY.—The Commission may not determine that there is no material injury or threat of material injury to an industry in the United States merely because that industry is profitable or because the performance of that industry has recently improved.

Organization of report

Part I of this report presents information on the subject merchandise, dumping margins, and domestic like product. *Part II* of this report presents information on conditions of competition and other relevant economic factors. *Part III* presents information on the condition of the U.S. industry, including data on capacity, production, shipments, inventories, and employment. *Parts IV* and *V* present the volume of subject imports and pricing of domestic and imported products, respectively. *Part VI* presents information on the financial experience of U.S. producers. *Part VII* presents the statutory requirements and information obtained for use in the Commission's consideration of the question of threat of material injury as well as information regarding nonsubject countries.

MARKET SUMMARY

Ferrovanadium is sold principally to steel manufacturers and also to iron foundries. Steelmakers utilize ferrovanadium as an alloying agent when producing certain types of steel. The two U.S. producers of ferrovanadium are AMG and Bear,[6] while the leading subject producers of ferrovanadium outside the United States include Korvan Ind. Co. Ltd. ("Korvan") and Woojin Ind. Co., Ltd. ("Woojin") of Korea. In June 2016, Gulf (the then-owner of Bear) and Bear filed for chapter 11 bankruptcy protection with the goal of finding a buyer.[7] In October 2016, Gulf sold Bear to Yilmaden Holding A.S. (a Turkish ferro metals company). The leading nonsubject producers of ferrovanadium outside of the United States include Panzhihua Iron &

[5] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.

[6] Bear is primarily a toll producer of ferrovanadium. Bear's top tollees in 2015 were ***. *** producer questionnaire, section II-4.

[7] "Gulf is still operating, still producing V205…But they are proceeding on two tracks. One is looking for a purchaser, looking for a buyer, and the other is preparing, if they don't find a buyer, preparing to, down the road to idle their facility. But I don't think they've set a hard date for either." Hearing transcript, p. 46 (Totaro).

Steel Group ("Panzhihua") of China, Rhovan PSV-Glencore South Africa Pty Ltd ("Rhovan") of South Africa, and Evraz Plc ("Evraz") of both Russia (Evraz Vanady Tula) and the Czech Republic (Evraz Nikom).[8] The leading U.S. importers of ferrovanadium from Korea are *** and ***.[9] Leading importers of ferrovanadium from nonsubject countries (primarily Austria, Canada, and the Czech Republic) include ***,[10] ***. The leading U.S. purchasers include ***. The leading purchasers are end-users (iron and steel producers).

Apparent U.S. consumption of ferrovanadium totaled approximately *** of contained vanadium (***) in 2015. U.S. producers' and tollees' U.S. shipments of contained vanadium totaled *** (***) in 2015, and U.S. producers and tollees accounted for *** of apparent U.S. consumption by quantity and *** by value. U.S. imports from Korea totaled 1.6 million pounds ($15.6 million) in 2015, and accounted for *** of apparent U.S. consumption by quantity and *** by value. U.S. imports from nonsubject sources totaled nearly *** and ($50.7 million) in 2015. U.S. imports from nonsubject sources accounted for *** of apparent U.S. consumption both by quantity and by value in 2015, respectively.

SUMMARY DATA AND DATA SOURCES

A summary of data collected in this investigation is presented in appendix C, table C-1. Except as noted, U.S. industry data are based on questionnaire responses of nine firms, consisting of two groups. The first group includes producers that either produce ferrovanadium for their own account or process the product for the account of other firms under a toll agreement. This group consists of U.S. producers AMG and Bear. The second group includes tolling customer firms that provide raw materials to the producer, retain title to the product produced, and ultimately sell the ferrovanadium to their customers. This group is commonly referred to as tollees, and consists of CCMA, LLC ("CCMA"), Energy Fuels, Inc. ("Energy Fuels"), Evraz Stratcor, Glencore, Gulf, Millbank Materials PA Ltd. ("Millbank"), and Traxys. U.S. imports are based on official commerce statistics and the questionnaire responses of 23 U.S. importers that are believed to have accounted for nearly all U.S. imports of ferrovanadium in 2015. Foreign industry data and related information are based on the three questionnaire responses of Fortune (solely an exporter), Korvan, and Woojin, firms believed to account for the majority of ferrovanadium exports from Korea. The three firms combined exports to the United States were equivalent to nearly all U.S. imports of ferrovanadium from Korea in 2015.

PREVIOUS AND RELATED INVESTIGATIONS

Ferrovanadium has been the subject of three prior antidumping duty investigations in the United States. Shieldalloy Metallurgical Corp. ("Shieldalloy"), New York, New York, filed a

[8] VanadiumCorp Resource Inc., "Vanadium Market: Vanadium Production by Country 2015," http://www.vanadiumcorp.com/tech/research/market, accessed February 24, 2017.

[9] ***.

[10] ***.

petition on May 31, 1994, alleging that an industry in the United States was materially injured and threatened with material injury by reason of less-than-fair-value ("LTFV") imports of ferrovanadium and nitrided vanadium from Russia. Following notification of a final determination by Commerce that imports of ferrovanadium and nitrided vanadium from Russia were being sold at LTFV, the Commission determined on May 19, 1995, that a domestic industry was materially injured by reason of LTFV imports of ferrovanadium and nitride vanadium from Russia. Commerce published the antidumping duty order on ferrovanadium and nitrided vanadium from Russia on July 10, 1995.[11]

In May 2001, the Commission completed a full five-year review of that order and determined that revocation of the antidumping duty order on ferrovanadium and nitride vanadium from Russia would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time. Following the affirmative determinations in the first five-year review by Commerce and the Commission, Commerce issued notice of a continuation of the antidumping duty order on imports of ferrovanadium and nitrided vanadium from Russia, effective June 7, 2001.[12]

In September 2006, the Commission completed an expedited five-year review of the subject order and determined that revocation of the antidumping duty order on ferrovanadium and nitrided vanadium from Russia would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time. Following the affirmative determinations in the second five-year review by Commerce and the Commission, Commerce issued notice of a continuation of the antidumping duty order on imports of ferrovanadium and nitrided vanadium from Russia, effective October 13, 2006.[13]

In August 2012, the Commission completed a full five-year review of the antidumping duty order on ferrovanadium and nitrided vanadium from Russia and determined that revocation of that order would not be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[14] On September 6, 2012, Commerce published notice of a revocation of the antidumping duty order on ferrovanadium and nitrided vanadium from Russia, effective October 13, 2011.[15]

The Ferroalloys Association Vanadium Committee and its members: Bear, Butler, Pennsylvania; Shieldalloy, Cambridge, Ohio; Gulf, Freeport, Texas; U.S. Vanadium Corp., Danbury, Connecticut; and CS Metals of Louisiana, Convent, Louisiana, filed petitions on November 26, 2001, alleging that an industry in the United States was materially injured and

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[11] *Notice of Antidumping Order: Ferrovanadium and Nitrided Vanadium from the Russian Federation,* 60 FR 35550, July 10, 1995.

[12] *Continuation of Antidumping Order: Ferrovanadium and Nitrided Vanadium from the Russian Federation,* 66 FR 30694, June 7, 2001.

[13] *Continuation of Antidumping Order: Ferrovanadium and Nitrided Vanadium from the Russian Federation,* 71 FR 60475, October 13, 2006.

[14] *Ferrovanadium and Nitrided Vanadium from Russia,* 77 FR 51825, August 27, 2012.

[15] *Ferrovanadium and Nitrided Vanadium from Russia,* 77 FR 54897, September 6, 2012.

threatened with material injury by reason of LTFV imports of ferrovanadium from China and South Africa.[16] Following notification of a final determination by Commerce that imports of ferrovanadium from China[17] and South Africa[18] were being sold at LTFV, the Commission determined that a domestic industry was materially injured by reason of LTFV imports of ferrovanadium from China and South Africa. Commerce published the antidumping duty orders on ferrovanadium from China and South Africa on January 28, 2003.[19] [20]

In November 2008, the Commission completed full five-year reviews of the antidumping duty orders on ferrovanadium from China and South Africa and determined that revocation of those orders would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[21] Following affirmative determinations in the first five-year reviews by Commerce and the Commission,[22] Commerce issued notice of continuation of the antidumping duty orders on imports of ferrovanadium from China and South Africa, effective December 19, 2008.[23]

In January 2015, the Commission completed full five-year reviews of the antidumping duty orders on ferrovanadium from China and South Africa and determined that revocation of those orders would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[24] Following affirmative determinations in the second five-year reviews by Commerce and the Commission,[25] Commerce issued notice of continuation of the antidumping duty orders on imports of ferrovanadium from China and South Africa, effective February 18, 2015.[26]

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[16] *Ferrovanadium from China and South Africa Inv. Nos. 731-TA-986-987 (Final),* USITC Publication 3570, January 2003.

[17] *Notice of Amended Final Antidumping Duty Determination of Sales at Less Than Fair Value and Antidumping Duty Order: Ferrovanadium from China*, 68 FR 4168, January 28, 2003.

[18] *Notice of Final Determination of Sales at LTFV: Ferrovanadium from the Republic of South Africa*, 67 FR 71136, November 29, 2002.

[19] *Notice of Amended Final Antidumping Duty Determination of Sales at LTFV and Antidumping Duty Order: Ferrovanadium from the People's Republic of China*, 68 FR 4167, January 28, 2003.

[20] *Notice of Antidumping Duty Order: Ferrovanadium from the Republic of South Africa*, 68 FR 4169, January 28, 2003.

[21] *Ferrovanadium from China and South Africa, Inv. Nos. 731-TA-986-987 (Review),* USITC Publication 4046, November 2008.

[22] *Ferrovanadium from China and South Africa: Final Results of the Expedited Sunset Reviews of the Antidumping Duty Orders,* 73 FR 19192, April 9, 2008; *Ferrovanadium from China and South Africa,* 73 FR 72837, December 1, 2008.

[23] *Ferrovanadium from China and South Africa: Continuation of Antidumping Duty Orders,* 73 FR 77609, December 19, 2008.

[24] *Ferrovanadium from China and South Africa, Inv. Nos. 731-TA-986-987 (Second Review),* USITC Publication 4517, January 2015.

[25] *Ferrovanadium from China and South Africa: Determinations,* 80 FR 5787, February 3, 2015.

[26] *Ferrovanadium from the People's Republic of China and the Republic of South Africa: Continuation of Antidumping Duty Orders,* 80 FR 8607, February 18, 2015.

NATURE AND EXTENT OF SALES AT LTFV

On March 23, 2017, Commerce published a notice in the *Federal Register* of its final determination of sales at LTFV with respect to imports from Korea.[27] Table I-1 presents Commerce's dumping margins with respect to imports of ferrovanadium from Korea.

Table I-1
Ferrovanadium: Commerce's final weighted-average LTFV margins with respect to imports from Korea

Exporter/Producer	Final dumping margin (*percent*)
Fortune Metallurgical Group Co., Ltd.	54.69
Korvan Ind. Co., Ltd.	3.22
Woojin Ind. Co., Ltd.	54.69
All others	3.22

Source: 82 FR 14874, March 23, 2017.

THE SUBJECT MERCHANDISE

Commerce's scope

Commerce has defined the scope of this investigation as follows: [28]

The product covered by this investigation is all ferrovanadium regardless of grade (i.e., percentage of contained vanadium), chemistry, form, shape, or size. Ferrovanadium is an alloy of iron and vanadium. Ferrovanadium is classified under Harmonized Tariff Schedule of the United States (HTSUS) item number 7202.92.0000. Although this HTSUS item number is provided for convenience and Customs purposes, the written description of the scope of the investigation is dispositive.

Tariff treatment

Ferrovanadium is classifiable in the Harmonized Tariff Schedule of the United States ("HTS") under subheading 7202.92.00. The normal trade relations import duty is 4.2 percent ad valorem. The import duty applicable to originating goods of Korea was phased out under the provisions of the U.S.-Korea Free Trade Agreement; the applicable rule of origin for heading 7202 (requiring a tariff chapter-level change for third-country inputs) effectively seems to require that imports wholly originate in Korea or in the United States. The applicable duty on

[27] *Ferrovanadium from the Republic of Korea: Final Determination of Sales at LTFV,* 82 FR 14874, March 23, 2017.

[28] *Ferrovanadium from the Republic of Korea: Final Determination of Sales at LTFV,* 82 FR 14874, March 23, 2017.

goods of Korea was 3.3 percent ad valorem effective March 15, 2012, 2.5 percent effective January 1, 2013, 1.6 percent effective January 1, 2014, 0.8 percent effective January 1, 2015, and free effective on and after January 1, 2016.[29]

THE PRODUCT

Description and applications

Ferrovanadium is an alloy used to add vanadium to molten steel. Steelmaking is the largest use of vanadium and accounts for almost all vanadium consumption worldwide.[30] Vanadium enhances strength and wear resistance and is therefore beneficial in certain construction alloy steels, rail steels, high-speed and heat-resisting tool and die steels, and high-strength low-alloy steels, often called microalloy steels. Microalloy steels are used in pipeline steel, concrete reinforcing bars, structural shapes and plate for construction, and in automobile components.[31]

Ferrovanadium is commonly produced in grades having a vanadium content of 40–60 percent or 75–85 percent. The choice of ferrovanadium grade as a steel additive depends on several factors. There are situations where either grade can be used in which case the choice is simply metallurgist preference. In certain steels highly alloyed with vanadium, such as tool steels, the ferrovanadium 80-percent grade is preferred. Specifically, the higher silicon levels in the 50-percent grade (as well as other residual elements) and the higher carbon levels are undesirable in some steels and so the 80-percent grade would be preferred.[32] Regardless of grade, commercial practice is to quote the price of ferrovanadium on the basis of the contained vanadium. Ferrovanadium is commonly packaged for sale in the United States in containers of a specified content of contained vanadium, typically 25 pounds of contained vanadium.

Although vanadium is one of the most common elements in the earth's crust, it is frequently found in concentrations that would be uneconomical to mine or process for vanadium content alone. As a result, it is most often produced as a by-product or co-product of other mineral operations. For example, the largest source of vanadium is a by-product of the production of steel using iron ore with high vanadium content. Iron ore containing recoverable vanadium is mined in only a few places in the world; the major producers are China, South

[29] Decisions on the tariff classification and treatment of imported goods are within the authority of U.S. Customs and Border Protection.

[30] Polyak, Désirée, *2015 Minerals Yearbook: Vanadium*, United States Geological Survey, November 2016, p. 81.2.

[31] Petition, pp. 8-9.

[32] Hearing transcript, pp. 48-49 (Anderson). AMG Vanadium, "Ferroalloys & Alloying Additives Online Handbook," Vanadium chapter, November 23, 2000, http://amg-v.com/vanadiumpage.html , retrieved March 27, 2017.

Africa, and Russia.[33] The second most common production method is recovery from vanadium-containing ore. Most ore production is in South Africa and China. The third and final method of vanadium production is secondary production from such sources as the residue from the processing and burning of vanadium-containing oil products. Such secondary production is the primary vanadium source in the United States.[34]

Manufacturing processes[35]

The manufacturing process to produce ferrovanadium is determined by the raw material to be used. Most operations utilize a two-step process: first, the production and separation of vanadium pentoxide from the other contents of the starting raw material, and second, the production of ferrovanadium from vanadium pentoxide. Vanadium pentoxide is an important intermediate chemical compound that is used primarily to produce ferrovanadium, but has many other applications such as being used in the manufacturing of sulfuric acid, chemical and environmental catalysts, batteries, among other uses.[36] It is widely traded and industry publications regularly report its price.

Bear's operations are based on the production of ferrovanadium for a processing fee (toll production), using vanadium pentoxide provided by its customers such as Gulf and Evraz Stratcor. The process used by Bear is aluminothermic, in which heat for the process is derived from chemical reactions. Vanadium pentoxide and aluminum are placed in a conversion vessel along with steel scrap and flux materials.[37] The contents are ignited with a fuse and the reaction proceeds quickly, with the oxidation (burning) of aluminum providing the heat. There is no external heat source such as electricity or gas. Following a reaction period of about seven minutes, the result is molten ferrovanadium and an aluminum-oxide-rich slag. The products are allowed to cool and freeze in the reaction vessel for about six hours. After cooling, both are crushed and sized for sale. Slag is sold for use as flux in steelmaking operations.[38]

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[33] Polyak, Désirée, *2015 Minerals Yearbook: Vanadium*, United States Geological Survey, November 2016, p. 81.2, Vanitec Limited, "Making Vanadium," http://vanitec.org/vanadium/making-vanadium, retrieved February 21, 2017.

[34] Polyak, Désirée, *2015 Minerals Yearbook: Vanadium*, United States Geological Survey, November 2016, p. 81.2, Vanitec Limited, "Making Vanadium," http://vanitec.org/vanadium/making-vanadium, retrieved February 21, 2017.

[35] Unless otherwise specified, information on U.S. manufacturing processes is from *Ferrovanadium from China and South Africa, Investigation Nos. 731-TA-986-987 (Second Review*), USITC Publication 4517, January 2015, pp. I-13 – I-15.

[36] Vanitec Limited, "Vanadium Products for Chemical Applications," http://vanitec.org/vanadium/vanadium-products, retrieved March 27, 2017.

[37] Flux is a purifying agent added during the manufacturing process. The flux reacts with the impurities to form a slag (agglomerated impurities) which floats on top of the ferrovanadium and can be skimmed off.

[38] *Ferrovanadium from China and South Africa, Investigation Nos. 731-TA-986-987 (Second Review)*, USITC Publication 4517, January 2015, p. I-13; conference transcript, pp. 26-27 (Carey).

AMG produces ferrovanadium and other ferroalloys from spent catalysts and petroleum combustion residues and uses pyrometallurgical processing in electrical furnaces. AMG's ferrovanadium contains approximately 55 percent of vanadium, in contrast to Bear's product, which contains 80 percent. AMG's product also contains more silicon but less aluminum than Bear's. Despite the difference in the contained vanadium content, the product is packaged similarly to 80-percent product, in individual cans or paper sacks, typically of 10-25 pounds of vanadium content, or in 2,000- or 4,000-pound supersacks.[39]

Spent oil refinery catalysts, as well as oil residues and ash, are waste products that are subject to regulation with respect to their handling, processing, and disposition. Two classes of spent catalysts are specifically classified as hazardous wastes under the Resource Conservation and Recovery Act ("RCRA"): hydrotreating catalysts (RCRA waste K171) and hydrorefining catalysts (RCRA waste K172). Receivers and processors of hazardous waste must be licensed and comply with RCRA regulations with respect to handling, processing, and record-keeping related to the hazardous wastes.[40]

Tollee operations

Gulf is primarily a processor of spent catalysts from oil refineries. Catalysts contain recoverable cobalt, molybdenum, nickel, and vanadium, and Gulf's operation depends upon the recovery not only of vanadium but of the other elements as well. Gulf produces vanadium pentoxide, which it transfers to Bear. Bear then processes the vanadium pentoxide into ferrovanadium in exchange for a processing fee.[41] The toll-produced ferrovanadium remains the property of Gulf.

Evraz Stratcor produces vanadium pentoxide as well as a variety of vanadium chemicals from vanadium ashes, residues, and other raw materials including vanadium-containing slag.[42]

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[39] In general, ferrovanadium is packaged for sale in a variety of types and sizes of containers. Steel companies reportedly have been changing their handling of alloy products to bulk systems, so 4,000-pound supersacks are increasingly common. In addition, packaging may be in cans or in bags, each with a specific amount of contained vanadium-from 10 to 25 pounds. Paper bags may be placed in a steel drum for protection. Conference transcript, pp. 57-58 (Anderson).

[40] *Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Petroleum Refining Process Wastes; Land Disposal Restrictions for Newly Identified Wastes; and CERCLA Hazardous Substance Designation and Reportable*, 63 FR 42110, August 6, 1998; Conference transcript, p. 29 (Valdes).

[41] Gulf, the former owner of Bear, filed for Chapter 11 bankruptcy protection in June 2016. In September 2016, Bear was acquired in a bankruptcy auction by Yilmaden Holding Inc. Bloomberg L.P., "Metals and Mining: Company Overview of Gulf Chemical & Metallurgical Corporation," http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=6843484, retrieved February 21, 2017.

[42] In February 2014, Evraz Stratcor began importing vanadium-containing slag from its parent company's steelmaking plant in Nizhny Tagil, Russia. When Evraz Stratcor's new slag processing facilities in the United States are at full production, this slag will be the primary feedstock. Evraz Stratcor, "New

(*continued*...)

The company transfers vanadium pentoxide to Bear, which processes the vanadium pentoxide into ferrovanadium. The toll-produced ferrovanadium remains the property of Evraz Stratcor, which is responsible for selling the product and administering the sales.

Other reporting tollees include CCMA, Energy Fuels, Glencore, Millbank, and Traxys. CCMA is a trading company handling metals, alloys, and other raw materials and ***.[43] Energy Fuels produces vanadium as a by-product of uranium mining at its White Mesa mill in Utah.[44] The company produces ***."[45] Glencore is both a trader and a producer of vanadium pentoxide and ferrovanadium. The company does not produce vanadium products in the United States. It ***.[46] ***.[47] *** is a trading company and ***.[48]

DOMESTIC LIKE PRODUCT ISSUES

No issues with respect to domestic like product have been raised in this investigation. The VPRA proposed in the petition and at the staff conference that the domestic like product should be defined as all grade of ferrovanadium, co-extensive with the scope definition, and as defined by the Commission in its previous related proceedings, i.e. ferrovanadium from China and South Africa.[49] [50] At the staff conference, counsel for foreign producer Korvan (respondent party) did not contest the VPRA's proposed domestic like product and domestic industry definitions.[51] Korvan was not aware of any evidence that would warrant defining the domestic like product differently than petitioners' proposal.[52] In the preliminary phase of this investigation, the Commission defined a single domestic like product consisting of the ferrovanadium products corresponding to the investigation's scope.[53] There were no comments on the Commission's draft questionnaires with respect to the domestic like product, and no party has advocated a different domestic like product in their briefs.

(…*continued*)
facilities at Hot Springs Plant Start Processing Vanadium-Bearing Steelmaking Slag," press release, February 6, 2014. Evraz Stratcor is using slag from Nizhny Tagil as a feedstock and "the stable deliveries of this product to EVRAZ Stratcor reduced dependence on third-party feedstock sources." EVRAZ plc *Annual Report and Accounts 2014,* p. 55, http://www.evraz.com/investors/annual_reports/.

[43] CCMA's producer questionnaire response, section II-4.

[44] Energy Fuels, "White Mesa Mill Utah," http://www.energyfuels.com/project/white-mesa-mill/ , retrieved February 27, 2017.

[45] Energy Fuels'producer questionnaire response, section I-2.

[46] Glencore's producer questionnaire response, section II-4.

[47] *** producer questionnaire response, section II-4.

[48] *** producer questionnaire response, section II-4.

[49] Petition, March 28, 2016, pp. 3-6.

[50] Conference transcript, pp. 83-84 (Maberry).

[51] Conference transcript, pp. 83-84 (Maberry).

[52] Conference transcript, p. 83 (Maberry).

[53] *Ferrovanadium from Korea*, *Inv. No. 731-TA-1315 (Preliminary)*, USITC Pub. 4611 May 2016, p. I-10.

PART II: CONDITIONS OF COMPETITION IN THE U.S. MARKET

U.S. MARKET CHARACTERISTICS

Ferrovanadium is a ferroalloy used to harden, strengthen and increase the anti-corrosive properties of steels and structural steel products, such as beams, pipe, and rebar for use in construction, engineering, rail, and a variety of other industries. It can be produced from vanadium-bearing iron ore, vanadium-bearing iron slag, by recycling spent oil refinery catalysts, and as a co-product of mineral operations. Ferrovanadium is sold primarily to end users such as steel companies, but also to iron foundries. It is sold in a variety of types of packaging, from small bags to drums to supersacks, and is sold on the basis of contained vanadium.[1]

Apparent U.S. consumption of ferrovanadium increased by *** percent between 2013 and 2014, but decreased by *** percent between 2014 and 2015. During January-September 2016, apparent U.S. consumption was *** percent lower than the same period during 2015.

U.S. PURCHASERS

The Commission received 28 usable questionnaire responses from firms that have purchased ferrovanadium since January 2013.[2] [3] Nineteen responding purchasers are end users (OEMs), nine are distributors, and one (***) is a processor ***. In general, responding U.S. purchasers were located mostly in the Northeast (14 firms) and Midwest (10 firms) regions, with two firms located in the Central Southwest, and one firm each located in the Southeast, and Pacific Coast regions.[4] The responding purchasers mostly represented firms in the steel industry. The largest purchaser of ferrovanadium in 2015 was *** (which accounted for *** percent of reported purchases in 2015), followed by *** (*** percent) and *** (*** percent).

CHANNELS OF DISTRIBUTION

U.S. producers/tollees sold mainly (***) to end users during January 2013-September 2016 (tables II-1a and II-1b). Importers of ferrovanadium from Korea reported selling mostly to

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[1] Petition, pp. 7-9.

[2] Of the 28 responding purchasers, 22 purchased domestic ferrovanadium, 10 purchased imports of the subject merchandise from Korea, and 21 purchased imports of ferrovanadium from other sources, including Austria (13 firms), the Czech Republic (11 firms), Canada (8 firms), Russia (8 firms), Japan (3 firms), Australia (2 firms), and China, Singapore, Switzerland, and Taiwan (one firm each). One firm also reported purchasing from Europe, but did not list the country/countries. Additionally, fourteen firms reported purchasing from unknown sources.

[3] ***. However, staff has not included these firms' purchaser questionnaire responses in this report's data set. ***. *** foreign producer questionnaire response, section I-5, and EDIS Doc. No. 599859. However, ***.

[4] No firms were from the Mountain region, which includes the states of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

distributors in 2013, mostly to end users in 2014, and an equal amount to distributors and end users in 2015. Importers of nonsubject ferrovanadium sold primarily to end users.

Table II-1a
Ferrovanadium: Shares of U.S. producers/tollees' and importers' U.S. commercial shipments, by sources and channels of distribution, 2013-15, January-September 2015, and January-September 2016

Item	Period				
	Calendar year			January-September	
	2013	2014	2015	2015	2016
	Share of reported shipments (*percent*)				
U.S. producers/tollees' U.S. commercial shipments of ferrovanadium:					
Distributors	***	***	***	***	***
End users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of ferrovanadium from Korea:					
Distributors	***	***	***	***	***
End users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of ferrovanadium from all other countries:					
Distributors	***	***	***	***	***
End users	***	***	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

Table II-1b
Ferrovanadium: Quantities of U.S. producers/tollees' and importers' U.S. commercial shipments, by sources and channels of distribution, 2013-15, January-September 2015, and January-September 2016

Item	Period				
	Calendar year			January-September	
	2013	2014	2015	2015	2016
	Quantity (*1,000 pounds contained vanadium*)				
U.S. producers/tollees' U.S. commercial shipments of ferrovanadium:					
Distributors	***	***	***	***	***
End users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of ferrovanadium from Korea:					
Distributors	***	***	***	***	***
End users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of ferrovanadium from all other countries:					
Distributors	***	***	***	***	***
End users	***	***	***	***	***
Total U.S. commercial shipments	***	***	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

GEOGRAPHIC DISTRIBUTION

U.S. producers/tollees and importers both reported selling ferrovanadium to all regions in the contiguous United States (table II-2). For U.S. producers/tollees, *** percent of sales were within 100 miles of their production facility, *** percent were between 101 and 1,000 miles, and *** percent were over 1,000 miles. Importers sold *** percent within 100 miles of their U.S. point of shipment, *** percent between 101 and 1,000 miles, and *** percent over 1,000 miles.

Table II-2
Ferrovanadium: Geographic market areas in the United States served by U.S. producers/tollees and importers

Region	U.S. producers/tollees	Importers
Northeast	7	8
Midwest	8	9
Southeast	6	7
Central Southwest	5	2
Mountain	3	2
Pacific Coast	3	1
Other[1]	0	0
All regions (except Other)	1	0
Reporting firms	9	10

[1] All other U.S. markets, including AK, HI, PR, and VI.

Source: Compiled from data submitted in response to Commission questionnaires.

SUPPLY AND DEMAND CONSIDERATIONS

U.S. supply

Domestic production

Based on available information, U.S. producers/tollees of ferrovanadium have the ability to respond to changes in demand with large changes in the quantity of shipments of U.S.-produced ferrovanadium to the U.S. market. The main contributing factors to this degree of responsiveness of supply are the availability of unused capacity and inventories, although responsiveness may be limited by the viability of shifting production to or from alternate products.

Industry capacity

AMG and Bear's capacity utilization fluctuated but increased overall, from *** percent in 2013 to *** percent in 2015. While Bear's capacity ***, its production *** percent from 2013 to 2015. AMG's *** increased from 2013 to 2015, ***.[5] This led to an overall increase in domestic capacity of *** percent, and an increase in production of *** percent. Compared to January-September 2015, domestic capacity was unchanged in January-September 2016, but total production was *** percent lower, leading to a decrease in capacity utilization of *** percentage points. This relatively low level of capacity utilization suggests that domestic producers may have substantial ability to increase production of product in response to an increase in prices.

Alternative markets

As a percentage of total shipments, U.S. producers/tollees' exports decreased *** from *** percent in 2013 to *** percent in 2015. During January-September 2016, U.S. producers/tollees' export shipments reached their highest level, at *** percent of total shipments. This relatively low level of shipments to export markets suggest that U.S. producers/tollees' may have a limited ability to shift shipments between the U.S. market and other markets in response to price changes.

Inventory levels

U.S. producers/tollees' inventories increased *** from 2013 to 2015, from *** pounds to approximately *** pounds. Relative to total shipments, U.S. producers/tollees' inventory levels decreased from *** percent in 2013 to *** percent in 2014 before increasing to *** percent in 2015. During January-September 2016, inventories relative to total shipments were at *** percent, compared to *** percent during January-September 2015. These inventory levels suggest that U.S. producers/tollees may have some ability to respond to changes in demand with changes in the quantity shipped from inventories.

Production alternatives

AMG reported that it ***. Bear reported that it could produce ferromolybdenum on the same equipment that it uses to produce ferrovanadium, but ***.[6] Bear added that ferrovanadium production is *** as ferromolybdenum production, and that ***.

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[5] AMG stated that its capacity increase was due to a furnace shell expansion completed in October 2014. Conference transcript, p. 22 (Anderson).

[6] ***. Conference transcript, p. 42 (Carey); Petitioners' postconference brief, Answers to staff questions, p. 2.

Supply constraints

Two U.S. producers/tollees (***) reported refusing, declining, or being unable to supply ferrovanadium since January 2013. ***, and that there have been periods since January 2013 in which it was unable to supply material due to poor market conditions. *** reported that it frequently lacked supply options that would allow it so supply its customer base, and that this was a normal occurrence in the ferrovanadium industry.

Gulf, a tollee and former owner of Bear, filed for Chapter 11 bankruptcy protection in June 2016, and announced plans in November 2016 to idle operations indefinitely beginning in late 2017.[7] Gulf was responsible for the ***-largest amount of U.S. commercial shipments of domestic ferrovanadium during 2013-15, accounting for *** percent of U.S. commercial shipments during this time.

Subject imports from Korea[8]

Based on available information, producers of ferrovanadium from Korea have the ability to respond to changes in demand with moderate changes in the quantity of shipments of ferrovanadium to the U.S. market. The main contributing factor to this degree of responsiveness of supply is the ability to shift shipments from alternate markets; Korean producers' supply responsiveness appears somewhat constrained by the limited availability of unused capacity or inventories.

Industry capacity

Korean producers' capacity utilization increased from 2013 to 2015, from *** percent to *** percent. While Korean capacity remained constant, overall production increased from *** pounds in 2013 to *** pounds in 2015. This relatively high level of capacity utilization in 2015 suggests that Korean producers may have a limited ability to increase production of ferrovanadium in response to an increase in prices. Overall, Korean producers projected capacity utilization rates of *** and *** percent for 2016 and 2017, respectively.[9]

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[7] In September 2016, Bear was acquired in a bankruptcy auction by Yilmaden Holding Inc. Metals and Mining: Company Overview of Gulf Chemical & Metallurgical Corporation. See http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=6843484, retrieved February 23, 2017.

[8] For data on the number of responding foreign firms and their share of U.S. imports from Korea, please refer to Part I, "Summary Data and Data Sources."

[9] Korean producers initially projected a capacity utilization rate of *** percent for 2016. One firm's response, however, contained anomalous and unreconciled discrepancies between its calendar year projections and its actual January –September 2016 activity. Accordingly, Staff has annualized this firm's 2016 shipment projections. See Part VII of this report at table VII-2.

Alternative markets

While Korean producers reported *** shipments to the United States between 2013 and 2015 (from *** pounds to *** pounds), their shipments to markets other than the United States ***, from *** pounds in 2013 to *** pounds in 2015. As a share of total shipments, Korean producers' exports to the United States increased from *** percent in 2013 to *** percent in 2015, and their exports to non-U.S. markets increased from *** percent to *** percent. Korean producers' reported shipments to their home market decreased from 2013 to 2015, from *** percent to *** percent of total shipments. These shipment quantities indicate that Korean producers may have substantial ability to shift shipments between domestic or other markets and the U.S. market in response to price changes. Korean producers identified their principal non-U.S. export markets as ***. *** reported that its ferrovanadium was subject to any other antidumping/countervailing, safeguard findings, remedies, or proceedings.

Inventory levels

Korea producers' inventories relative to total shipments increased from *** percent in 2013 to *** percent in 2014, but returned to *** percent in 2015. These inventory levels suggest that responding foreign firms may have a limited ability to respond to changes in demand with changes in the quantity shipped from inventories.

Production alternatives

Korean producer *** reported that it could switch production from ferrovanadium to ***, but that its ability to switch depended on *** and vanadium prices as well as market demands.

Supply constraints

Korean producer *** reported that rapid changes in the market prices of *** and vanadium, as well as unstable raw materials sourcing affect its ability to produce ferrovanadium. Korean producer *** reported being limited by the supply of labor and raw materials, as well as an uncertain global steel market.

Nonsubject imports

Nonsubject imports accounted for *** percent of all imports of ferrovanadium in 2015. The largest sources of nonsubject imports during 2013-15 were the Czech Republic, Austria, and Canada. Combined, these countries accounted for *** percent of nonsubject imports and *** percent of all imports of ferrovanadium in 2015. The Czech Republic alone accounted for *** percent of nonsubject imports and *** percent of all imports of ferrovanadium in 2015. *** is by far the largest importer of nonsubject ferrovanadium; its imports of nonsubject product from *** accounted for *** percent of all reported nonsubject imports in 2015.

New suppliers

Five of 26 responding purchasers indicated that new suppliers have entered the U.S. market since January 1, 2013. Two firms (***) named Largo Resources, a vanadium pentoxide producer in Brazil, noting that its material was marketed and sold by Glencore. One firm (***) reported that Grondmet (a Germany-based trading house involved in the distribution of raw materials for the steel industry) opened an office in the United States in 2014. One firm (***) named SiderAlloys as a new supplier since January 2013, and one firm (***) reported that there are often new suppliers and traders entering and leaving the ferrovanadium market.

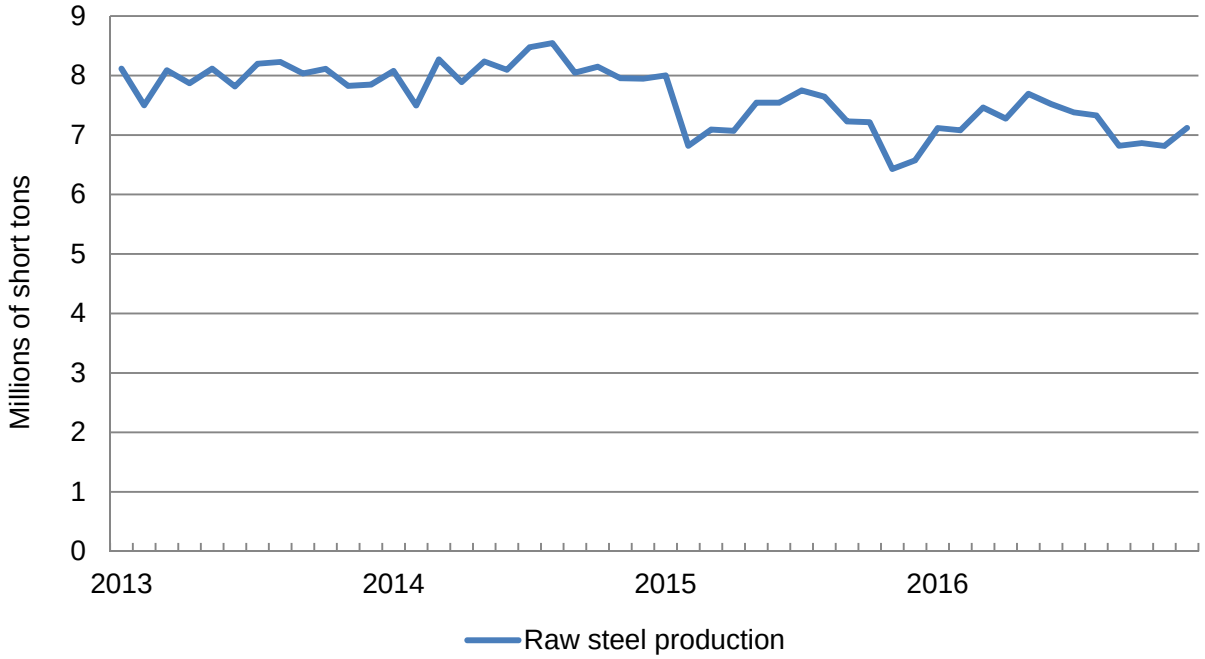
U.S. demand

Based on available information, the overall demand for ferrovanadium is likely to experience small-to-moderate changes in response to changes in price. The main contributing factors are the somewhat limited utility of substitute products and the very small cost share of ferrovanadium in steel production.

Ferrovanadium is used almost exclusively by the steel industry. Demand for ferrovanadium is therefore a derived demand that is driven mostly by trends in steel production and overall economic conditions. Petitioners report that the U.S. steel industry consumes ferrovanadium at a high rate per ton relative to other countries, making demand in the U.S. market is strong relative to other markets.[10] Between January 2013 and September 2016, overall steel production in the United States decreased by 16.0 percent (figure II-1). Between September and December of 2016, steel production grew by 4.4 percent.

[10] Hearing transcript, pp. 7 (Totaro), 30 (Lutz), 60 (Totaro), 61-62 (Anderson).

Figure II-1
Steel production: Raw steel production in the United States, in millions of short tons, monthly, January 2013-December 2016



Source: AISI, retrieved January 30, 2017.

End uses and cost share

U.S. demand for ferrovanadium depends on the demand for U.S.-produced downstream products. Ferrovanadium is primarily used in the production of steel products, particularly high strength and anti-corrosive steel alloys. The vast majority of reporting firms indicated that ferrovanadium accounts for a very small share (1-5 percent) of the cost of steel production. In contrast, one purchaser, ***, reported that ferrovanadium makes up 25 percent of the cost of three of its products (***), and one purchaser, ***, reported a cost share of 100 percent.

Purchasers were asked whether demand for their final products that incorporate ferrovanadium had increased, decreased, not changed, or fluctuated since January 2013. Three firms reported that demand for their final products had increased, 4 reported that it had decreased, 5 reported that it had not changed, and 13 firms reported that it fluctuated. Two of the three firms that reported an increase in demand for their end use products (***) are manufacturers of tool steels or tool steel powders, and one (***) is a manufacturer of steel ingots, rolls, and castings. Three of the four firms that reported a decrease in demand for their end use products (***) are manufacturers of steel products, while one (***) is also a manufacturer of tool steels. When asked if the change in demand for their final products had had any affect on their demand for ferrovanadium, 17 firms reported that it did, and 8 reported that it did not. A number of firms indicated that there is a close relationship between the demand for ferrovanadium and the demand for the end use products that incorporate it.

Business cycles

The majority of firms (4 of 7 U.S. producers/tollees, 13 of 19 importers, and 16 of 24 purchasers) reported that the ferrovanadium market was not subject to business cycles or distinct conditions of competition. However, two U.S. producers/tollees, six importers, and six purchasers reported that the market was subject to business cycles, with most of these firms citing seasonal demand (i.e. a decline in demand during the summer months) or cyclical demand tied to the overall U.S. economy in the steel industry.

One U.S. producer/tollee, two importers, and five purchasers also reported that the ferrovanadium market was subject to distinct conditions of competition. *** stated that the ferrovanadium market has a limited distributor base, *** indicated that the demand for ferrovanadium depends on infrastructure projects and construction business, and *** stated that the collapse in oil prices affected demand for vanadium in the beginning of 2015. Among purchasers, *** cited product availability, *** cited steel market cycles in the United States and abroad, and *** cited that the availability of spent catalysts used in the oil refinery business as distinct conditions of competition. *** also listed a number of factors, including foreign currency valuations relative to the U.S. dollar, demand in non-U.S. markets, the quantity of contract vs. spot sales, and levels of steel imports.

Demand trends

A majority of U.S. producers/tollees and a plurality of importers reported a decrease in U.S. demand for ferrovanadium since January 2013, while the majority of purchasers reported that demand had fluctuated (table II-3).

Table II-3
Ferrovanadium: Firms' responses regarding U.S. demand and demand outside the United States

Item	Increase	No change	Decrease	Fluctuate
Demand in the United States				
U.S. producers/tollees	0	1	5	1
Importers	2	5	8	4
Purchasers	1	4	5	12
Demand outside the United States				
U.S. producers/tollees	1	0	4	1
Importers	2	5	8	3
Purchasers	2	2	3	10
Demand for purchasers' final products	3	5	4	13

Source: Compiled from data submitted in response to Commission questionnaires.

Among the firms that reported a decrease in demand for ferrovanadium, most cited a decrease in demand for and/or production of steel as the reason. *** also cited weak demand in the oil and energy markets, *** cited an increase in steel imports, and purchasers *** cited poor economic conditions. The firms reporting an increase in demand for ferrovanadium cited an increase in infrastructure projects and greater demand for high strength steel as reasons.

Most other firms listed steel demand and/or oil prices as the dominant influence in ferrovanadium demand trends.

Substitute products

The majority of responding U.S. producers/tollees (5 of 6) and importers (9 of 16) reported that there are substitutes for ferrovanadium, while the majority of purchasers reported that there were not. Most (13) of the firms that listed substitutes for ferrovanadium mentioned ferroniobium. Some of these firms noted that ferroniobium is typically more expensive than ferrovanadium, and that viable substitutability depends on price levels of the two materials. Petitioners stated that while ferroniobium can be considered a technical substitute, it is considerably more expensive than ferrovanadium and most firms consider it uneconomical to do so.[11] Other listed substitutes included ferrocolumbium (mentioned by 4 firms), nitrided vanadium (mentioned by 3 firms), and ferrotitanium (mentioned by 2 firms).

Firms were also asked about the substitutability of different grades of ferrovanadium.[12] Regarding the substitutability of 75-85 grade ferrovanadium with other grades, a plurality of firms (11 of 24) reported that other grades could "never" be substituted for 75-85 grade. Five firms reported that 75-85 grade was "always" substitutable with other grades, with *** stating that it is substitutable with all other grades in all applications. Two firms reported that it was "usually" substitutable other grades, with *** stating that *** can readily substitute 40-60 grade for 75-85 grade, but that *** could not use a different grade. Five firms reported that 40-60 grade could "sometimes" be substituted for 75-85 grade. Regarding the substitutability of 40-60 grade with other grades, one firm reported that it was "always" substitutable, 3 firms reported that it was "usually" substitutable, 4 firms reported that it was "sometimes" substitutable, and 3 firms reported that it was "never" substitutable.

SUBSTITUTABILITY ISSUES

The degree of substitution between domestic and imported ferrovanadium depends upon such factors as relative prices, quality (e.g., grade standards, reliability of supply, defect rates, etc.), and conditions of sale (e.g., price discounts/rebates, lead times between order and delivery dates, payment terms, product services, etc.). Based on available data, staff believes that there is high degree of substitutability between domestically produced ferrovanadium and ferrovanadium imported from Korea.

[11] Hearing transcript, pp. 64-65 (Lutz).

[12] Among the responding firms, 23 reported purchasing grade 75-85 ferrovanadium, 8 reported purchasing grade 40-60 ferrovanadium, and one firm (***) reported purchasing grade 70 ferrovanadium.

Lead times

Ferrovanadium is primarily sold from U.S. inventory. U.S. producers/tollees reported that *** percent of their commercial shipments were from sold from inventory, with lead times averaging 5 days. The remaining *** percent was produced-to-order, with a lead time of *** days.[13] Importers reported that *** percent of their commercial shipments were from sold from inventory, with lead times averaging 9 days. The remaining *** percent was produced-to-order, with lead times averaging 40 days.

Knowledge of country sources

Twenty-one purchasers indicated they had marketing/pricing knowledge of domestic ferrovanadium, and six of Korean ferrovanadium. Among nonsubject countries, 10 purchasers reported having knowledge of Austrian product, 8 of Canadian product, 8 of product from the Czech Republic, 4 of Russian product, and 2 of Japanese product.

As shown in table II-4, the large majority of purchasers and their customers "never" make purchasing decisions based on the producer or country of origin. Of the purchasers that reported that they either "always" or "usually" make decisions based the manufacturer or country of origin, *** reported that it must make sure none of the ferrovanadium it purchases is produced in the Democratic Republic of the Congo, *** reported that it normally purchases from a producer with which it has working knowledge and, in most cases, a performance history, and *** reported that it prefers the material produced at Bear.

Table II-4
Ferrovanadium: Purchasing decisions based on producer and country of origin

Purchaser/Customer Decision	Always	Usually	Sometimes	Never
Purchaser makes decision based on producer	3	2	2	21
Purchaser's customers make decision based on producer	0	0	3	20
Purchaser makes decision based on country	2	2	4	19
Purchaser's customers make decision based on country	0	0	3	19

Source: Compiled from data submitted in response to Commission questionnaires.

Factors affecting purchasing decisions

The most often cited top-three factors firms consider in their purchasing decisions for ferrovanadium were price (29 firms), quality[14] (22 firms), and availability/on-time delivery (19 firms) (table II-5). Quality was the most frequently cited first-most important factor (cited by 14

[13] Only one firm, ***, reported shipments of ferrovanadium that was produced-to-order.

[14] Quality characteristics listed by responding purchasers included the following: ability to meet company or customer specifications, assay, chemical consistency, cleanliness, furnace performance, grade, packaging, sizing, transportation, and a limit on the amount of certain other elements (such as aluminum, phosphorous, carbon, silicon, and sulfur).

firms), followed by price (11 firms); price was the most frequently reported second-most important factor (12 firms); and availability/on-time delivery was the most frequently reported third-most important factor (9 firms).

Table II-5
Ferrovanadium: Ranking of factors used in purchasing decisions as reported by U.S. purchasers, by factor

Factor	First	Second	Third	Total
Price	11	12	6	29
Quality factors	14	6	2	22
Availability / on time delivery	2	8	9	19
Other[1]	1	2	9	12

[1] Other factors include contract terms, payment terms, credit, service, reliability, contract performance history, chemistry, location, and that the product comes from a traditional supplier.

Source: Compiled from data submitted in response to Commission questionnaires.

The majority of purchasers (18 of 27) reported that they "usually" purchase the lowest-priced product. Six firms reported that they "always" purchase the lowest-priced product, two reported that they "sometimes" do, and one reported that it "never" does. When asked if they purchased ferrovanadium from one source although a comparable product was available at a lower price from another source, seven purchasers reported doing so for the following reasons: security of supply from the United States and Canada; availability; quality; and specifications/ tolerances.

Six of 23 responding purchasers reported that certain types of ferrovanadium were only available from a single source. A number of these reported that certain grades[15] were only available from particular countries; grade 80 was reported to be available from the United States, Korea, the Czech Republic, and Russia, and grade 50 was reported to be available from the United States, Japan, and Austria.

Importance of specified purchase factors

Purchasers were asked to rate the importance of 16 factors in their purchasing decisions (table II-6). All 28 responding firms rated price as very important. Other factors rated as very important by more than half of responding purchasers were availability and quality exceeds industry standards (27 each); grade (contained vanadium) (25); delivery time (23); product consistency and reliability of supply (22 each); delivery terms (18); packaging (17); and discounts offered (16). More firms reported that product range was not important than reported that it was very important.

[15] Grades of ferrovanadium grades are characterized by percentage of contained vanadium. Ferrovanadium is most commonly produced in grades having a vanadium content of 40–60 percent or 75-85 percent.

Table II-6
Ferrovanadium: Importance of purchase factors, as reported by U.S. purchasers, by factor

Factor	Very important	Somewhat important	Not important
Availability	27	1	0
Delivery terms	18	10	0
Delivery time	23	5	0
Discounts offered	16	10	2
Extension of credit	13	12	3
Grade (contained vanadium)	25	3	0
Minimum quantity requirements	10	15	3
Packaging	17	8	3
Price	28	0	0
Product consistency	22	6	0
Product range	6	12	10
Quality exceeds industry standards	27	1	0
Quality meets industry standards	12	9	7
Reliability of supply	22	6	0
Technical support/service	8	14	6
U.S. transportation costs	13	10	5

Source: Compiled from data submitted in response to Commission questionnaires.

Supplier certification

Sixteen of 27 responding purchasers require their suppliers to become certified or qualified to sell ferrovanadium to their firm. Purchasers reported that the time to qualify a new supplier ranged from 15 to 180 days. A number of purchasers reported that suppliers were required to have ISO or other certification, and a number of purchasers reported requiring trial material for testing. Other requirements for certification included analyses of a supplier's financial situation, supplier reliability, location of source, responsible sourcing, economic sanctions, chemistry, and environmental management. One firm (***) also reported conducting plant inspections. No purchasers reported that domestic or foreign supplier had failed in its attempt to qualify product, or had lost its approved status since 2013.

Changes in purchasing patterns

Purchasers were asked about changes in their purchasing patterns from different sources since 2013 (table II-7). Most responding purchasers reported that their purchase patterns fluctuated from all sources. Purchasers reported increasing purchases of U.S. product because of price, contracts, and changes in suppliers, and decreasing purchases of U.S. product because of business conditions. Purchasers reported fluctuating purchases of domestic ferrovanadium due to price, availability, switching sources, a lost contract, steel industry demand, and negotiations on requests for quotation ("RFQs"). The firms that reported fluctuating purchases of Korean ferrovanadium reported doing so due to availability,

fluctuations in the steel industry, and price. Only one firm that reported increasing or decreasing purchases from Korea since January 2013 gave a reason for doing so; *** reported decreasing purchases from Korea because it was "decreasingly competitive."

Table II-7
Ferrovanadium: Changes in purchase patterns from U.S., subject, and nonsubject countries

Source of purchases	Did not purchase	Decreased	Increased	Constant	Fluctuated
United States	1	2	4	4	12
Korea	7	3	1	1	6
Other	2	4	0	3	12
Source unknown	6	0	2	4	7

Source: Compiled from data submitted in response to Commission questionnaires.

Eighteen of 27 responding purchasers reported that they had changed suppliers since January 2013. A number of these firms reported changing suppliers based on price. Two firms mentioned dropping *** due to better discounts or pricing being offered by other firms. Two firms also mentioned that JuliMar exited the ferrovanadium business due to bankruptcy. As noted above, five purchasers reported that new suppliers entered the market since January 2013: two firms named Largo Resources, a vanadium pentoxide producer in Brazil, one firm reported that Grondmet opened an office in the United States in 2014, one firm named SiderAlloys, and one firm reported that new suppliers and traders often enter and leaving the ferrovanadium market.

Importance of purchasing domestic product

Twenty-seven of 28 responding purchasers reported that purchasing U.S.-produced product was not an important factor in all their purchasing decisions, and no purchasers reported that any of their purchases were required to be domestic by them or their customers. One firm reported that it prefers purchasing from local companies but that it does not know the source of the product these firms supply.

Comparisons of domestic products, subject imports, and nonsubject imports

Purchasers were asked a number of questions comparing ferrovanadium produced in the United States, subject countries, and nonsubject countries. First, purchasers were asked for a country-by-country comparison on the same 16 factors for which they were asked to rate the importance. Most purchasers reported that U.S., Korean, and nonsubject ferrovanadium were comparable on all 16 factors (table II-8).

Table II-8

Ferrovanadium: Purchasers' comparisons between U.S.-produced and imported product

Factor	U.S. vs. Korea			U.S. vs. nonsubject			Korea vs. nonsubject		
	S	C	I	S	C	I	S	C	I
Availability	2	8	1	3	14	1	2	8	0
Delivery terms	3	7	1	3	14	1	1	9	0
Delivery time	4	6	1	4	13	1	2	7	0
Discounts offered	2	8	1	2	15	1	1	9	0
Extension of credit	3	7	1	3	14	1	0	10	0
Grade (contained ferrovanadium)	1	10	0	1	17	0	1	9	0
Minimum quantity requirements	2	8	1	2	16	0	0	10	0
Packaging	2	8	1	3	15	0	0	10	0
Price[1]	1	8	2	2	13	3	1	9	0
Product consistency	2	9	0	2	16	0	1	9	0
Product range	0	10	0	0	17	1	1	9	0
Quality exceeds industry standards	0	11	0	2	16	0	0	10	0
Quality meets industry standards	1	10	0	1	16	1	0	10	0
Reliability of supply	4	6	1	4	13	1	3	8	0
Technical support/service	4	5	1	4	12	1	0	9	0
U.S. transportation costs[1]	3	7	0	3	14	0	0	9	0

[1] A rating of superior means that price/U.S. transportation cost is generally lower. For example, if a firm reported "U.S. superior," it meant that the U.S. product was generally priced lower than the imported product.

Note.--S=first listed country's product is superior; C=both countries' products are comparable; I=first list country's product is inferior.

Source: Compiled from data submitted in response to Commission questionnaires.

Comparison of U.S.-produced and imported ferrovanadium

In order to determine whether U.S.-produced ferrovanadium can generally be used in the same applications as imports from Korea, U.S. producers/tollees, importers, and purchasers were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in table II-9, most U.S. producers/tollees and importers reported that ferrovanadium was "always" interchangeable, regardless of country source. Most purchasers reported that ferrovanadium from all country pairs was either "always" or "frequently" interchangeable.

Table II-9

Ferrovanadium: Interchangeability between ferrovanadium produced in the United States and in other countries, by country pair

Country pair	Number of U.S. producers/tollees reporting				Number of importers reporting				Number of purchasers reporting			
	A	F	S	N	A	F	S	N	A	F	S	N
U.S. vs. subject countries:												
U.S. vs. Korea	5	1	0	0	12	5	1	0	3	7	3	0
Nonsubject countries comparisons:												
U.S. vs. Austria	5	1	0	0	10	6	1	0	7	8	2	0
U.S. vs. Canada	5	1	0	0	11	5	1	0	6	7	1	0
U.S. vs. Czech Republic	5	1	0	0	10	5	1	0	7	5	1	0
U.S. vs. Other	5	1	0	0	11	5	2	0	5	5	1	0
Korea vs. Austria	5	1	0	0	11	5	0	0	3	5	3	0
Korea vs. Canada	5	1	0	0	12	4	0	0	3	5	2	0
Korea vs. Czech Republic	5	1	0	0	12	4	0	0	4	4	1	0
Korea vs. Other	5	1	0	0	12	4	1	0	2	3	1	0
Austria vs. Canada	5	1	0	0	11	5	0	0	6	5	1	0
Austria vs. Czech Republic	5	1	0	0	11	5	0	0	5	5	1	0
Austria vs. Other	5	1	0	0	11	4	1	0	3	4	0	0
Canada vs. Czech Republic	5	1	0	0	12	4	0	0	5	4	0	1
Canada vs. Other	5	1	0	0	11	4	1	0	2	3	0	0
Czech Republic vs. Other	5	1	0	0	11	4	1	0	3	3	1	0

Note.—A=Always, F=Frequently, S=Sometimes, N=Never.

Source: Compiled from data submitted in response to Commission questionnaires.

Most responding purchasers reported that domestically produced and imported ferrovanadium from Korea and nonsubject countries Austria, Canada, and the Czech Republic "always" met minimum quality specifications (table II-10).

Table II-10

Ferrovanadium: Ability to meet minimum quality specifications, by source[1]

Source	Always	Usually	Sometimes	Rarely or never
United States	15	7	0	0
Korea	8	3	0	0
Austria	11	5	0	0
Canada	7	5	0	0
Czech Republic	10	4	0	1
Other	4	3	0	1

[1] Purchasers were asked how often domestically produced or imported ferrovanadium meets minimum quality specifications for their own or their customers' uses.

Source: Compiled from data submitted in response to Commission questionnaires.

In addition, U.S. producers/tollees, importers, and purchasers were asked to assess how often differences other than price were significant in sales of ferrovanadium from the United States, subject, or nonsubject countries. Three U.S. producers/tollees (***) reported that there were "never" differences other than price for all country pairs, while the other three (***) reported that there "sometimes" were. Most importers also reported that there were "sometimes" differences other than price. Either a majority or a plurality of purchasers reported that there were "sometimes" differences other than price for all country pairs.

Table II-11

Ferrovanadium: Significance of differences other than price between ferrovanadium produced in the United States and in other countries, by country pairs

Country pair	Number of U.S. producers/tollees reporting				Number of U.S. importers reporting				Number of purchasers reporting			
	A	F	S	N	A	F	S	N	A	F	S	N
U.S. vs. subject country:												
U.S. vs. Korea	0	0	3	3	2	1	8	6	3	3	6	1
Nonsubject countries comparisons:												
U.S. vs. Austria	0	0	3	3	1	1	9	5	4	3	8	2
U.S. vs. Canada	0	0	3	3	1	1	8	6	3	3	5	2
U.S. vs. Czech Republic	0	0	3	3	0	1	8	6	0	2	8	3
U.S. vs. Other	0	0	3	3	3	1	8	6	1	2	7	2
Korea vs. Austria	0	0	3	3	0	0	7	7	2	3	5	1
Korea vs. Canada	0	0	3	3	0	0	7	7	2	3	4	1
Korea vs. Czech Republic	0	0	3	3	0	0	7	7	1	2	5	1
Korea vs. Other	0	0	3	3	1	0	7	7	0	2	4	0
Austria vs. Canada	0	0	3	3	0	0	7	7	2	3	5	2
Austria vs. Czech Republic	0	0	3	3	0	0	7	7	0	2	6	3
Austria vs. Other	0	0	3	3	0	0	7	7	0	2	4	1
Canada vs. Czech Republic	0	0	3	3	0	0	7	7	0	2	5	2
Canada vs. Other	0	0	3	3	0	0	7	7	0	2	3	0
Czech Republic vs. Other	0	0	3	3	0	0	7	7	0	2	5	0

Note.--A = Always, F = Frequently, S = Sometimes, N = Never.

Source: Compiled from data submitted in response to Commission questionnaires.

ELASTICITY ESTIMATES[16]

U.S. supply elasticity

The domestic supply elasticity[17] for ferrovanadium measures the sensitivity of the quantity supplied by U.S. producers/tollees to changes in the U.S. market price of ferrovanadium. The elasticity of domestic supply depends on several factors including the level of excess capacity, the ease with which producers can alter capacity, producers' ability to shift to production of other products, the existence of inventories, and the availability of alternate markets for U.S.-produced ferrovanadium. Analysis of these factors above indicates that the U.S. industry has the ability to moderately to greatly increase or decrease shipments to the U.S. market; an estimate in the range of 3 to 5 is suggested.

U.S. demand elasticity

The U.S. demand elasticity for ferrovanadium measures the sensitivity of the overall quantity demanded to a change in the U.S. market price of ferrovanadium. This estimate depends on factors discussed above such as the existence, availability, and commercial viability of substitute products, as well as the component share of the ferrovanadium in the production of any downstream products. Based on the available information, the aggregate demand for ferrovanadium is likely to be relatively inelastic; a range of -0.3 to -0.8 is suggested.

Substitution elasticity

The elasticity of substitution depends upon the extent of product differentiation between the domestic and imported products.[18] Product differentiation, in turn, depends upon such factors as quality (e.g., chemistry, appearance, etc.) and conditions of sale (e.g., availability, sales terms/ discounts/ promotions, etc.). Based on available information, the elasticity of substitution between U.S.-produced ferrovanadium and imported ferrovanadium is likely to be in the range of 3 to 5.

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[16] No party commented on these estimates in their prehearing or posthearing briefs.

[17] A supply function is not defined in the case of a non-competitive market.

[18] The substitution elasticity measures the responsiveness of the relative U.S. consumption levels of the subject imports and the domestic like products to changes in their relative prices. This reflects how easily purchasers switch from the U.S. ferrovanadium to the subject products (or vice versa) when prices change.

PART III: U.S. PRODUCERS' PRODUCTION, SHIPMENTS, AND EMPLOYMENT

The Commission analyzes a number of factors in making injury determinations (see 19 U.S.C. §§ 1677(7) (B) and 1677(7) (C)). Information on the dumping margins was presented in *Part I* of this report and information on the volume and pricing of imports of the subject merchandise is presented in *Part IV* and *Part V*. Information on the other factors specified is presented in this section and/or *Part VI* and (except as noted) is based on the questionnaire responses of nine firms which are believed to account for essentially all U.S. production and nearly all shipments of ferrovanadium in 2015.

U.S. PRODUCERS AND TOLLEES

The Commission issued U.S. producer/tollee questionnaires to 10 firms based on information contained in the petition. The Commission received usable U.S. producer/tolleee questionnaire responses from two producers and seven tollees.[1] The responding U.S. producers include firms that either produce ferrovanadium for their own accounts or process the product for the accounts of other firms under a toll agreement. This group consists of U.S. producers AMG and Bear. The responding tollees include firms that provide raw materials to the producer, retain title to the product produced, and ultimately sell the ferrovanadium to its customers. This group consists of CCMA, Energy Fuels, Evraz Stratcor, Glencore, Gulf, Millbank, and Traxys. Staff believes that these responses represent all U.S. production and nearly all U.S. shipments of ferrovanadium.

Table III-1 lists the U.S. producers of ferrovanadium, their production locations, positions on the petition, and shares of total production for 2015.

Table III-1
Ferrovanadium: U.S. producers of ferrovanadium, their position on the petition, production locations, and shares of reported production, 2015

Firm	Position on petition	Production location(s)	Share of production (percent)
AMG	Support	Cambridge, OH	***
Bear	Support	Butler, PA	***
Total			100.0

Source: Compiled from data submitted in response to Commission questionnaires.

Table III-2 presents a list of current U.S. producers and tollees of ferrovanadium and each company's position on the petition, headquarters, production locations, and share of reported U.S. shipments of ferrovanadium in 2015.

[1] ***. ***

Table III-2
Ferrovanadium: U.S. producers and tollees, their position on the petition, location, and share of reported U.S. shipments, 2015

Firm	Position on petition	Headquarters	Share of U.S. shipments (percent)
AMG	Support	Cambridge, OH	***
Bear	Support	Butler, PA	***
CCMA	***	Amherst, NY	***
Energy Fuels	***	Blanding, UT	***
Evraz Stratcor	Support	Hot Springs, AR	***
Glencore	***	Stamford, CT	***
Gulf	Support	Freeport, TX	***
Millbank	***	Carnegie, PA	***
Traxys	***	New York, NY	***
Total			100.0

Source: Compiled from data submitted in response to Commission questionnaires.

As indicated in table III-3, three U.S. producers/tollees *** are related to foreign producers of ferrovanadium, while none are related to U.S. importers of ferrovanadium. In addition, as discussed in greater detail below, five U.S. producers/tollees *** directly import ferrovanadium and four U.S. producers/tollees *** purchase ferrovanadium from both subject and nonsubject U.S. importers.

Table III-3
Ferrovanadium: U.S. producers' ownership, related and/or affiliated firms

* * * * * * *

On June 14, 2016, Gulf and Bear filed for chapter 11 bankruptcy protection with the goal of finding a buyer. Gulf (the former owner of Bear) stated that it and Bear were sensitive to the metals markets, and declining prices have cut into their profits.[2] After Bear was sold to Yilmaden Holding Inc., Gulf announced plans to idle operations in November 2016.[3] Gulf was responsible for the ***-largest amount of U.S. shipments of domestic ferrovanadium during

[2] Gulf, the former owner of Bear, filed for Chapter 11 bankruptcy protection in June 2016. "Gulf Chemical & Metallurgical Files for Bankruptcy Protection," See https://www.wsj.com/articles/gulf-chemicalmetallurgicalfilesforbankruptcyprotection1465919807?emailToken=JRrzf/xyaHuWh9Y0bcwzyVkmK6IIBuqITVrTaXXHJkHIsGHPruOqzqFwidqzrHjqS0FgotoN6W0lWCXNi3svRNWWh7N0jVajfTwE8s+ZgFTaahyE , retrieved February 23, 2017.

[3] "The US Bankruptcy Court gave an order approving the sale of substantially all the assets of Bear Metallurgical Company on September 13, 2016. The debtor has been authorized to sell substantially all its assets to Yilmaden Holding Inc.," http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=6843484, retrieved February 23, 2017.

2015, accounting for *** percent of U.S. shipments in that year. Gulf was also Bear's *** tollee of vanadium pentoxide in 2015 accounting for nearly *** percent of Bear's toll production. *** were the second-and-third-largest tollees to Bear in 2015. The loss of Gulf contributed to Bear's January-September 2016 production levels to decrease by approximately *** percent of its January-September 2015 production levels. Bear continues to toll produce vanadium pentoxide.[4]

As of the hearing on March 21, 2017, Gulf continues to seek a buyer.[5] Gulf's plant is still operating and producing vanadium pentoxide (in a limited capacity). There is no set date for the plant's idling.

U.S. producers and tollees were asked to indicate whether their firm had experienced any plant openings, relocations, expansions, acquisitions, consolidations, closures, or prolonged shutdowns because of strikes or equipment failure; curtailment of production because of shortages of materials or other reasons, including revision of labor agreements; or any other change in the character of their operations or organization relating to the production of ferrovanadium since 2013. Five of the nine U.S. producers/tollees that provided responses indicated that they had experienced such changes; their responses are presented in table III-4.

Table III-4
Ferrovanadium: U.S. producers' reported changes in operations since January 1, 2013

* * * * * * *

U.S. PRODUCTION, CAPACITY, AND CAPACITY UTILIZATION

Table III-5 and figure III-1 present U.S. producers' production, capacity, and capacity utilization. Total capacity and total production increased from 2013 to 2015, by *** and *** respectively, resulting in an overall increase in capacity utilization from *** percent in 2013 to *** percent in 2015. The capacity and production increases were largely driven by ***.[6] [7] On a firm by firm basis, *** increased its capacity by *** and its production by *** percent, leading

[4] "We're receiving material from Gulf, but it's been purchased by a third party. So they're selling all of their V205 to a third party, which is then converting with Bear." Hearing transcript, p. 48 (Totaro).

[5] "Unfortunately, Gulf has not yet found a buyer and the potential loss of tolling volume that would occur if Gulf idled its production facility is a major concern to us." Hearing transcript, p. 27 (Totaro).

[6] *** producer questionnaire response, section II-2.

[7] AMG's Vice President of Global Marketing and Sales described AMG's increase in capacity, noting that "During the early part of the period of investigation, AMG made several substantial capital investments to improve our production facilities. Based on the market conditions at the time these projects were planned, we reasonably expected these investments would facilitate increased production and market share gains for our company. However, our ability to sustain these investments became extremely difficult in the face of major decline in revenue that our company experienced due to imports from Korea in 2015." Hearing transcript, p. 20 (Anderson).

to an increase in its capacity utilization of *** percent during 2013-15. *** reported *** levels of capacity during 2013-15, most of which was ***. *** production decreased by *** over the same period, however, leading to a decrease in its capacity utilization from *** percent in 2013 to *** percent in 2015. Compared to January-September 2015, domestic capacity was unchanged in January-September 2016, but total production was *** percent lower, leading to a decrease in capacity utilization of *** percentage points.

Table III-5
Ferrovanadium: U.S. producers' production, capacity, and capacity utilization, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

Figure III-1
Ferrovanadium: U.S. producers' production, capacity, and capacity utilization, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

Table III-6 presents U.S. producers' overall capacity and production on the same equipment that used to produce ferrovanadium. Overall capacity increased during 2013-15 by *** percent, while production of ferrovanadium increased by *** percent over the same period.[8] From 2013 to 2015, the rate of total production on the same machinery increased by *** percent, and the overall capacity utilization rate increased by *** percentage points. The share of ferrovanadium production decreased by *** percentage points, ***. The production of all other products increased by *** percent during 2013-15, and the share of production of all other products increased by *** percentage points during the same period.[9] [10]

[8] Capacity utilization rates were calculated on overall capacity utilization for both the production of ferrovanadium and all other products. Table III-5 was calculated based on production of ferrovanadium.

[9] AMG's data include ***. *** produced *** using the same equipment and machinery used in the production of ferrovanadium. See *Investigation Nos. 731-TA-986-987 (Second Review): Ferrovanadium from China and South Africa—Staff Report,* INV-MM-127, December 16, 2014, pp. III-7-8.

[10] AMG's response to Commissioner's question regarding production of other products on the same machinery, "For AMG vanadium, they reported there the product they produce is vanadium and the other products that result in that and that they sell are byproducts of the vanadium production, so it's not a question of allocating production to one or the other. When they produce ferrovanadium, these byproducts are generated." Hearing transcript, p. 71 (Totaro).

Table III-6
Ferrovanadium: U.S. producers' overall capacity and production on the same equipment as subject production, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

Table III-7 presents U.S. producers/tollees' reported shares of total U.S. shipments of ferrovanadium by grade in 2015. As noted earlier, *** produces ferrovanadium with 40-60 percent contained vanadium and *** produces ferrovanadium with 75-85 percent contained vanadium on behalf of tollee firms who ship ferrovanadium to commercial customers. ***.

Table III-7
Ferrovanadium: U.S. producers/tollees' U.S. shipments by grade, 2015

Item	U.S. shipments by grade Share of quantity (percent)
40-60 percent vanadium content	***
75-85 percent vanadium content[1]	***
Other grades	***
Total U.S. shipments	100.0

[1] ***.
Note.--***.

Source: Compiled from data submitted in response to Commission questionnaires.

U.S. PRODUCERS/TOLLEES' U.S. SHIPMENTS AND EXPORTS

Table III-8 presents U.S. producers/tollees' U.S. shipments, export shipments, and total shipments. From 2013 to 2015, the quantity of total shipments increased by *** percent, and U.S. shipments increased *** percent. The quantity of export shipments increased slightly (by *** percent) between 2013 and 2015. The value of total shipments decreased by *** percent between 2013 and 2015. From 2013 to 2015, U.S. shipments decreased in value by *** percent and export shipments decreased in value by *** percent.

From 2013 to 2015, the unit value for total shipments (decreased by *** percent), U.S. shipments (decreased by *** percent), and export shipments (decreased by *** percent). All decreased by approximately ***. However, the shares of the quantity and the value for both U.S. shipments and export shipments ***.

Table III-8
Ferrovanadium: U.S. producers/tollees' U.S. shipments, exports shipments, and total shipments, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

U.S. PRODUCERS/TOLLEES' INVENTORIES

Table III-9 presents U.S. producers/tollees' inventories. End-of-period inventories fell from 2013 to 2014, a decrease of *** percent, while the increase in end-of-period inventories from 2014 to 2015 was *** percent. *** end-of-period inventories also fluctuated from 2013 to 2014, a decrease of *** percent, while the increase in end-of-period inventories from 2014 to 2015 was *** percent. *** end-of-period inventories increased by *** percent between 2013 and 2015. *** inventories remained low and relatively unchanged. The end-of-period inventories among *** increased from 2013 to 2015 by *** percent.[11]

Table III-9
Ferrovanadium: U.S. producers/tollees' inventories, 2013-15, and January-September 2015, and January-September 2016

* * * * * * *

U.S. PRODUCERS/TOLLEES' IMPORTS AND PURCHASES

Table III-10 presents U.S. producers/tollees' U.S. shipments of U.S. produced ferrovanadium, subject imports, and imports from nonsubject sources during 2013-15. Of the five U.S. producers/tollees that imported ferrovanadium (***), *** was the only firm that did not complete a U.S. importer questionnaire.[12] *** was the only firm that imported the subject merchandise from Korea in 2013, and it imported (***). *** imported ferrovanadium from Korea in 2014, while *** only imported ferrovanadium from nonsubject sources during 2013-15. ***. *** decision-making of whether to import or purchase ferrovanadium includes many factors, but in 2015 it was "***"[13] In 2015, *** imported over *** from Korea, while *** imported over *** from Korea that year. *** consistently imported the largest quantities of ferrovanadium. *** imported from both subject and nonsubject sources, while *** did not begin importing until 2015.[14] *** was the largest subject importer in 2015, and increased its imports to *** from less than *** in 2014.[15]

---

[11] *** end-of-period inventories increased from *** in 2013 to *** pounds of contained vanadium in 2015. *** increase in end-of-period inventories accounted for *** percent of the increase in the end-of-period inventories for unaffiliated tollees from 2013 to 2015. *** producer questionnaire response, section II-8.

[12] *** provided a letter detailing its U.S. import operations, but did not complete an importer questionnaire. ***. *** importer statement, submitted on January 20, 2017.

[13] In response to Commissioner's hearing question, the VPRA indicated that, "Supply decisions with regard to imports from the Czech Republic into the United States are based on a number of factors ***" VPRA's posthearing brief, p. 13.

[14] *** importer questionnaire response, section II-4.

[15] "***" *** importer questionnaire response, section II-4.

Table III-10
Ferrovanadium: U.S. producers/tollees' U.S. imports, 2013-15, January-September 2015, and January- September 2016

* * * * * * *

Table III-11 presents U.S. producers' purchases.[16] From 2013 to 2015, *** purchased ferrovanadium from U.S. importers, U.S. producers/tollees, and U.S. distributors. In 2015, *** purchased Korean ferrovanadium through U.S. importer ***.[17] *** purchased *** pounds of ferrovanadium from *** in 2015, which accounted for *** of *** reported imports in 2015.[18] [19] In 2014 and 2015, *** purchased ferrovanadium from U.S. producers/tollees ***, which accounted for the *** purchases. *** also purchased ferrovanadium from U.S. distributor ***.[20]

Table III-11
Ferrovanadium: U.S. producers' U.S. purchases, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

Table III-12 presents U.S. tollees' purchases. From 2013 to 2015, *** U.S. tollees purchased ferrovanadium. *** was the only tollee that did not purchase ferrovanadium. *** purchased Korean ferrovanadium through U.S. importers. *** purchased *** of ferrovanadium from Korea through U.S. importers ***, during 2013-15. In 2013 and 2014, *** purchased approximately *** pounds of ferrovanadium through Korea from U.S. importers ***.[21] *** purchased approximately *** pounds of Korean ferrovanadium through *** in 2013 and 2014, which accounted for approximately *** of *** U.S. imports of ferrovanadium from Korea.[22] *** did not purchase Korean ferrovanadium through U.S. importers in 2015. *** purchased *** pounds of Korean ferrovanadium from *** in 2014, which accounted for approximately *** of *** reported U.S. imports from Korea in 2014. In 2013 and 2015, *** did not purchase Korean ferrovanadium through U.S. importers. *** purchased *** pounds of Korean ferrovanadium through *** in 2013 and 2014, which accounted for approximately *** of *** reported U.S. imports from Korea in 2013 and 2014. *** purchased *** pounds of Korean ferrovanadium

[16] *** had a one-time purchase of *** pounds of ferrovanadium from *** in 2015.

[17] ***. Email from ***, January 4, 2017.

[18] "***." *** producer questionnaire response, section II-12.

[19] *** imported *** pounds of ferrovanadium from Korea in 2015. *** importer questionnaire response, section II-10. *** indicated in question II-5 of its importer questionnaire that it sells ferrovanadium exclusively to distributors. *** indicated that it only had two customers in 2015; the other was ***.

[20] Since 2014, ***. *** producer questionnaire response, section II-12.

[21] *** importer questionnaire responses, section II-5.

[22] *** importer questionnaire response, section III-21.

through U.S. importer *** in 2015, which accounted for *** of *** imports in 2015.[23] *** indicated the reason each firm purchased ferrovanadium was ***.[24]

Table III-12
Ferrovanadium: U.S. tollees' U.S. purchases, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

U.S. EMPLOYMENT, WAGES, AND PRODUCTIVITY

Table III-13 shows U.S. producers' employment-related data. Employment reached *** PRWs in 2015, an *** percent increase from the *** PRWs in 2013.[25] However, while employment increased overall, the two producers had different trends.[26] Total hours worked increased by *** percent, up from *** in 2013 to *** in 2015. The hours worked per PRW decreased by *** percent from 2013 to 2015, while the wages paid increased by nearly *** dollars, or *** percent, during the same period. The hourly wages also increased by *** per hour, or *** percent, from 2013 to 2015, while the productivity (in pounds contained per hour) increased by ***, or *** percent, over the same period. The unit labor costs increased by *** between 2013 and 2015, a *** percent increase.

Table III-13
Ferrovanadium: U.S. producers' employment related data, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

[23] *** importer questionnaire response, section III-21.

[24] *** producer questionnaire responses, section II-12. *** indicated the reason they purchased ferrovanadium.

[25] "***. *** producer questionnaire response, section II-10.

[26] "***. *** producer questionnaire response, section II-10.

PART IV: U.S. IMPORTS, APPARENT U.S. CONSUMPTION, AND MARKET SHARES

U.S. IMPORTERS

The Commission issued importer questionnaires to 27 firms believed to be importers of ferrovanadium, as well as to all U.S. producers of ferrovanadium.[1] Usable questionnaire responses were received from 23 companies, representing essentially all U.S. imports from Korea in 2015 under HTS subheading 7202.92.0000.[2] Table IV-1 lists all responding U.S. importers of ferrovanadium from Korea and other sources, their locations, and their shares of U.S. imports, in 2015.[3] In 2015, *** accounted for the largest volumes of imports of ferrovanadium from Korea, while *** accounted for the largest volumes of imports of ferrovanadium from nonsubject sources.

[1] The Commission issued questionnaires to those firms identified in the petition, along with firms that, based on a review of data provided by ***, may have accounted for more than one percent of total imports under HTS subheading 7202.92.0000 in 2015.

[2] Official U.S. import statistics, using statistical reporting number 7202.92.0000, accessed December 1, 2016, and adjusted to include suppressed quantity data for U.S. imports from ***, using proprietary Customs records.

[3] An additional firm, ***, provided a letter detailing its U.S. import operations, but did not complete an importer questionnaire. *** imports accounted for less than one percent of total imports of ferrovanadium annually. *** importer statement, submitted on January 20, 2017.

Table IV-1
Ferrovanadium: U.S. importers, their headquarters, and share of imports by source, 2015

Firm	Headquarters	Share of imports by source (percent)		
		Korea	Nonsubject sources	All import sources
Absolute	West Chester, OH	***	***	***
CAI	Belvidere, IL	***	***	***
CCMA	Amherst, NY	***	***	***
DJJ	Cincinnati, OH	***	***	***
Evraz	Hot Springs, AR	***	***	***
Fortis	Central Hong Kong	***	***	***
Glencore Ltd	Stamford, CT	***	***	***
Grondmet	Brooklyn, NY	***	***	***
ICD Metals LLC	New York, NY	***	***	***
JuliMar	Jenks, OK	***	***	***
Masterloy Inc.	Woodmere, NY	***	***	***
Masterloy Products	Ottawa, ON	***	***	***
MBR Metals OU	Tallinn, Estonia	***	***	***
Medima	Clarence, NY	***	***	***
Metherma	Dusseldorf, Germany	***	***	***
MoTiV Metals LLC	Bridgeville, PA	***	***	***
ProFound	Mcmurray, PA	***	***	***
Selectrode	Aliquippa, PA	***	***	***
Sideralloys	Lugano, Switzerland	***	***	***
Titan	Cinaminson, NJ	***	***	***
Traxys North America LLC	New York, NY	***	***	***
Treibacher	Althofen, Austria	***	***	***
Tremond	New York, NY	***	***	***
Total		***	***	***

Note.--***. *** importer questionnaire response, section II-5.

Source: Compiled from data submitted in response to Commission questionnaires.

U.S. IMPORTS

U.S. imports from subject and nonsubject countries

Table IV-2 and figure IV-1 present U.S. imports by source. U.S. imports from Korea increased by 105.6 percent between 2013 and 2015, while the quantities of nonsubject sources and all import sources decreased by *** and ***, respectively. The value of U.S. imports from Korea increased by 62.9 percent, while the values of imports from nonsubject sources and all import sources decreased by *** and ***, respectively. U.S. imports from Korea increased their share of quantity by *** percentage points and their share of value percent by *** percentage points over the same period. The unit value of U.S. imports from Korea decreased by 20.6 percent, while the unit value of nonsubject sources and all import sources decreased by ***

and ***, respectively. U.S. imports from Korea were 54.0 percent lower in January-September 2016 than in January-September 2015, while imports from nonsubject sources were modestly higher. Average unit values for imports from Korea were sharply lower in January-September 2016 than in January-September 2015.

Table IV-2
Ferrovanadium: U.S. importers by source, 2013-15, January-September 2015, and January-September 2016

Item	Calendar year			January to September	
	2013	2014	2015	2015	2016
	Quantity (1,000 pounds contained vanadium)				
U.S. imports from.--					
Korea	784	1,243	1,612	1,156	532
Austria	880	861	1,375	1,148	1,410
Canada	1,119	1,917	1,062	929	149
Czech Republic	4,933	***	***	***	***
All other sources	467	536	325	323	583
Nonsubject sources	7,400	***	***	***	***
All import sources	8,184	***	***	***	***
	Value (1,000 dollars)				
U.S. imports from.--					
Korea	9,599	14,715	15,636	12,005	3,806
Austria	11,597	11,988	13,150	11,545	11,507
Canada	13,194	23,915	10,981	9,869	1,091
Czech Republic	53,144	41,166	23,157	19,653	15,999
All other sources	6,005	6,141	3,443	3,391	4,800
Nonsubject sources	83,939	83,210	50,732	44,459	33,398
All import sources	93,538	97,925	66,367	56,465	37,204
	Unit value (dollars per pound contained vanadium)				
U.S. imports from.--					
Korea	12.24	11.84	9.70	10.38	7.15
Austria	13.18	13.92	9.56	10.05	8.16
Canada	11.79	12.47	10.34	10.63	7.31
Czech Republic	10.77	***	***	***	***
All other sources	12.85	11.45	10.58	10.49	8.24
Nonsubject sources	11.34	***	***	***	***
All import sources	11.43	***	***	***	***

Table continued on next page.

Table IV-2--Continued
Ferrovanadium: U.S. importers by source, 2013-15, January-September 2015, and January-September 2016

Item	Calendar year			January to September	
	2013	2014	2015	2015	2016
	Share of quantity (percent)				
U.S. imports from.--					
Korea	9.6	***	***	***	***
Austria	10.8	***	***	***	***
Canada	13.7	***	***	***	***
Czech Republic	60.3	***	***	***	***
All other sources	5.7	***	***	***	***
Nonsubject sources	90.4	***	***	***	***
All import sources	100.0	100.0	100.0	100.0	100.0
	Share of value (percent)				
U.S. imports from.--					
Korea	10.3	15.0	23.6	21.3	10.2
Austria	12.4	12.2	19.8	20.4	30.9
Canada	14.1	24.4	16.5	17.5	2.9
Czech Republic	56.8	42.0	34.9	34.8	43.0
All other sources	6.4	6.3	5.2	6.0	12.9
Nonsubject sources	89.7	85.0	76.4	78.7	89.8
All import sources	100.0	100.0	100.0	100.0	100.0
	Ratio to U.S. production				
U.S. imports from.--					
Korea	***	***	***	***	***
Austria	***	***	***	***	***
Canada	***	***	***	***	***
Czech Republic	***	***	***	***	***
All other sources	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***

Source: Official U.S. import statistics, using statistical reporting number 7202.92.0000, accessed December 1, 2016, and adjusted to include suppressed quantity data for U.S. imports from ***, using proprietary Customs records.

Figure IV-1
Ferrovanadium: U.S. import quantities and average unit values 2013-15, January-September 2015, and January-September 2016

* * * * * * *

Monthly imports

Table IV-3 and figure IV-2 present monthly U.S. imports, by source, from January 2013 to December 2016. *** generally supplied the largest quantity of monthly imports. Table IV-4 and figure IV-3 present monthly U.S. imports value, by source, from January 2013 to December2016. The Czech Republic consistently had the highest values of U.S. imports of ferrovanadium from January 2013 to December 2016.

Table IV-3
Ferrovanadium: Monthly U.S. imports quantity, by source, since January 2013-December 2016

Item	Korea	Austria	Canada	Czech Republic	All other sources	Total imports
	Quantity (1,000 pounds contained vanadium)					
2013.--January	36	22	199	178	56	490
February	0	93	222	390	43	747
March	36	80	89	711	66	982
April	48	55	137	426	78	744
May	89	114	57	676	0	936
June	105	138	55	497	45	840
July	162	0	40	496	19	718
August	36	78	79	357	19	569
September	59	59	33	71	39	261
October	36	104	95	249	20	502
November	20	58	75	388	59	601
December	158	80	39	495	23	795
2014.--January	0	154	190	354	90	789
February	53	0	115	305	38	511
March	236	64	175	396	67	939
April	171	165	190	267	21	814
May	64	43	69	217	20	413
June	170	42	141	426	21	800
July	175	27	186	319	20	727
August	0	44	208	284	56	593
September	109	109	102	***	75	***
October	75	41	238	***	34	***
November	156	116	161	***	94	***
December	34	57	140	***	0	***

Table continued on next page.

Table IV-3--Continued
Ferrovanadium: Monthly U.S. imports quantity, by source, since January 2013-December 2016

Item	Korea	Austria	Canada	Czech Republic	All other sources	Total imports
Quantity (1,000 pounds contained vanadium)						
2015.--January	220	261	148	***	30	***
February	138	18	66	***	74	***
March	278	192	271	***	107	***
April	239	115	94	***	73	***
May	147	140	172	***	36	***
June	36	44	68	***	1	***
July	31	97	13	***	1	***
August	0	174	96	***	3	***
September	66	107	0	***	0	***
October	102	82	66	***	1	***
November	318	95	33	***	1	***
December	36	49	34	***	0	***
2016.--January	109	0	0	***	71	***
February	107	108	0	***	35	***
March	0	130	68	***	36	***
April	36	178	0	***	60	***
May	160	86	0	***	100	***
June	0	278	48	***	69	***
July	72	264	0	***	128	***
August	36	226	33	***	41	***
September	11	141	0	***	44	***
October	0	163	0	***	0	***
November	0	125	82	***	63	***
December	0	299	18	***	83	***

Source: Official U.S. import statistics, using statistical reporting number 7202.92.0000, accessed March 7, 2017, and adjusted to include suppressed quantity data for U.S. imports from ***, using proprietary Customs records.

Figure IV-2
Ferrovanadium: Monthly U.S. imports quantity, by source, January 2013-December 2016

* * * * * * *

Table IV-4
Ferrovanadium: Monthly U.S. imports value, by source, January 2013-December 2016

Item	Korea	Austria	Canada	Czech Republic	All other sources	Total imports
	Value (1,000 dollars)					
2013.-- January	427	248	2,561	2,002	693	5,930
February	0	1,357	2,345	4,456	563	8,721
March	451	889	1,144	8,654	878	12,016
April	691	868	1,851	5,023	1,127	9,561
May	1,167	1,691	732	7,911	0	11,501
June	1,318	1,739	721	5,217	600	9,596
July	1,962	0	539	4,990	259	7,750
August	426	1,058	1,023	3,435	242	6,183
September	683	802	378	671	464	2,996
October	384	1,470	1,034	2,364	225	5,476
November	238	704	641	3,698	615	5,896
December	1,853	772	225	4,723	340	7,913
2014.-- January	0	1,741	2,338	3,490	1,054	8,623
February	610	0	1,508	3,210	462	5,791
March	2,776	821	2,178	4,277	797	10,849
April	2,049	2,060	2,345	3,076	226	9,756
May	795	937	901	2,547	227	5,406
June	2,061	912	1,921	4,944	261	10,099
July	2,096	585	2,113	3,734	241	8,769
August	0	588	2,695	3,224	686	7,193
September	1,277	1,782	1,363	2,799	873	8,093
October	866	492	2,911	4,030	386	8,687
November	1,790	1,364	2,001	1,939	928	8,021
December	395	707	1,642	3,896	0	6,639

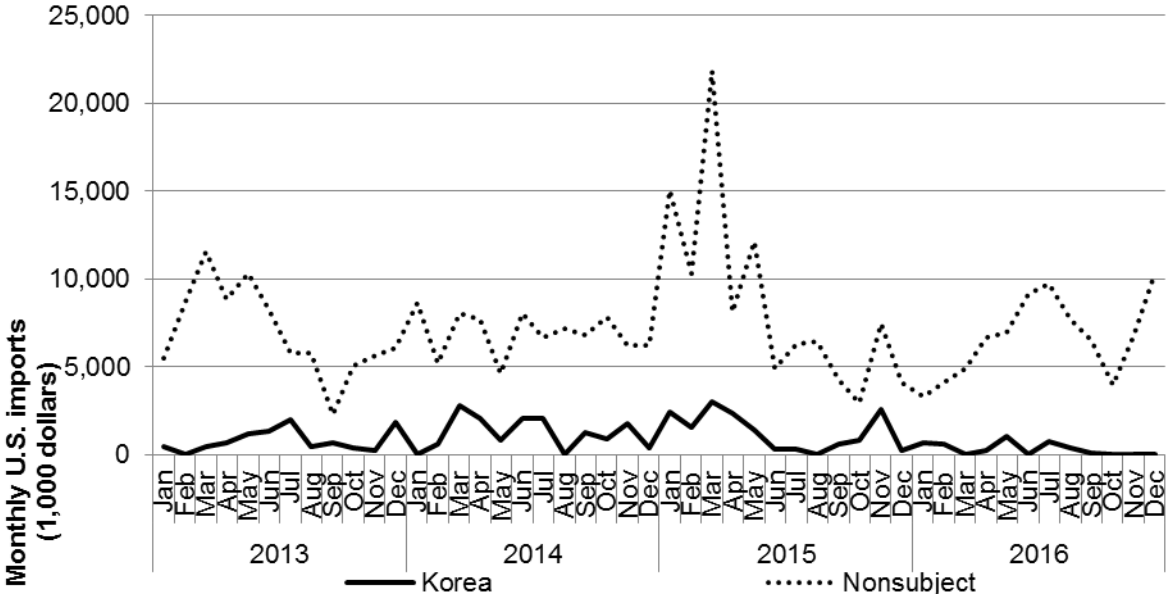
Table continued on next page.

Table IV-4--Continued
Ferrovanadium: Monthly U.S. imports value, by source, January 2013-December 2016

Item	Korea	Austria	Canada	Czech Republic	All other sources	Total imports
	Value (1,000 dollars)					
2015.-- January	2,436	3,031	1,683	2,768	345	10,264
February	1,533	420	814	2,581	775	6,123
March	2,983	2,016	3,054	4,228	1,146	13,427
April	2,369	1,107	1,015	579	716	5,786
May	1,447	1,302	1,597	2,788	314	7,447
June	311	448	673	1,402	15	2,849
July	316	850	132	2,421	26	3,744
August	0	1,512	894	1,511	55	3,971
September	611	859	7	1,376	0	2,853
October	841	640	580	123	25	2,209
November	2,571	691	264	1,830	26	5,382
December	219	274	268	1,551	0	2,312
2016.-- January	656	0	6	936	400	1,998
February	597	613	0	1,242	204	2,657
March	0	755	418	1,425	221	2,819
April	208	1,231	0	2,226	403	4,068
May	1,056	642	0	1,780	855	4,333
June	0	2,444	361	2,341	657	5,803
July	790	2,628	5	2,019	1,130	6,572
August	378	1,959	297	1,844	534	5,011
September	121	1,235	4	2,185	396	3,942
October	0	1,448	0	1,257	9	2,713
November	0	1,030	876	1,296	670	3,872
December	0	2,782	207	2,808	790	6,587

Source: Official U.S. import statistics, using statistical reporting number 7202.92.0000, accessed March 7, 2017.

Figure IV-3
Ferrovanadium: Monthly U.S. imports value, by source, January 2013-December 2016



Source: Official U.S. import statistics, using statistical reporting number 7202.92.0000, accessed March 7, 2017.

Table IV-5 presents U.S. importers' U.S. imports, by grade in 2015. The vast majority of imports had a vanadium content of 75-85 percent.

Table IV-5
Ferrovanadium: U.S. importers' U.S. shipments by grade, 2015

Item	U.S. importers' U.S. shipments by grade		
	Korea	Nonsubject sources	All import sources
	Quantity (1,000 pounds contained vanadium)		
40-60 percent vanadium content	***	***	***
75-85 percent vanadium content	***	***	***
Other grades	***	***	***
Total U.S. shipments	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

NEGLIGIBILITY

The statute requires that an investigation be terminated without an injury determination if imports of the subject merchandise are found to be negligible.[4] Negligible imports are generally defined in the Tariff Act of 1930, as amended, as imports from Korea of merchandise corresponding to a domestic like product where such imports account for less than 3 percent of the volume of all such merchandise imported into the United States in the most recent 12-month period for which data are available that precedes the filing of the petition or the initiation of the investigation. However, if there are imports of such merchandise from a number of countries subject to investigations initiated on the same day that individually account for less than 3 percent of the total volume of the subject merchandise, and if the imports from those countries collectively account for more than 7 percent of the volume of all such merchandise imported into the United States during the applicable 12-month period, then imports from such countries are deemed to be negligible.[5] From March 2015-February 2016, imports from Korea accounted for *** percent of total imports of ferrovanadium by quantity and 23.6 percent by value.

[4] Sections 703(a)(1), 705(b)(1), 733(a)(1), and 735(b)(1) of the Act (19 U.S.C. §§ 1671b(a)(1), 1671d(b)(1), 1673b(a)(1), and 1673d(b)(1)).

[5] Section 771 (24) of the Act (19 U.S.C § 1677(24)).

APPARENT U.S. CONSUMPTION AND U.S. MARKET SHARES

Table IV-6 and Figure IV-4 present data on apparent U.S. consumption and U.S. market shares for ferrovanadium. Apparent U.S. consumption by quantity increased by *** percent during 2013-15, while apparent U.S. consumption by value decreased by *** percent over the same period. From 2013 to 2015, U.S. producers' U.S. shipments increased in quantity by *** percent and decreased in value by *** percent, respectively. U.S. producers' U.S. shipments decreased in quantity by *** percent and in value by *** percent from 2014 to 2015. U.S. imports from Korea increased in quantity by 105.6 percent and 62.9 percent in value, respectively, from 2013 to 2015. From 2013 to 2015, U.S. imports from nonsubject sources decreased in quantity by *** percent and *** percent by value, respectively. During 2013-15, U.S. imports from all sources decreased in quantity by *** percent and in value by *** percent, respectively.

U.S. market share data are presented in table IV-6. From 2013 to 2015, U.S. producers' share of quantity of total U.S. shipments increased by *** percentage points, while its share of value increased by *** percentage points. U.S. imports from Korea's share of the quantity of U.S. shipments increased by *** percentage points to *** percent, ***, and Korea's share of the value of U.S. shipments increased by *** percentage points to *** percent, also ***. From 2013 to 2015, the share of total quantity of U.S. imports from nonsubject sources decreased by *** percentage points and the share of the value from nonsubject sources decreased by *** percentage points.

Table IV-6
Ferrovanadium: U.S. shipments of domestic ferrovanadium, U.S. shipments of imports, and apparent U.S. consumption, 2013-15, January-September 2015, and January-September 2016

Item	Calendar year			January to September	
	2013	2014	2015	2015	2016
	Quantity (1,000 pounds contained vanadium)				
U.S. producers' U.S. shipments	***	***	***	***	***
U.S. imports.--					
Korea	784	1,243	1,612	1,156	532
Nonsubject sources	7,400	***	***	***	***
All import sources	8,184	***	***	***	***
Apparent U.S. consumption	***	***	***	***	***
	Value (1,000 dollars)				
U.S. producers' U.S. shipments	***	***	***	***	***
U.S. imports.--					
Korea	9,599	14,715	15,636	12,005	3,806
Nonsubject sources	83,939	83,210	50,732	44,459	33,398
All import sources	93,538	97,925	66,367	56,465	37,204
Apparent U.S. consumption	***	***	***	***	***
	Share of quantity (percent)				
U.S. producers' U.S. shipments	***	***	***	***	***
U.S. imports.--					
Korea	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***
	Share of value (percent)				
U.S. producers' U.S. shipments	***	***	***	***	***
U.S. imports.--					
Korea	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***

Source: Official U.S. import statistics, using statistical reporting number 7202.92.0000, accessed December 1, 2016, and adjusted to include suppressed quantity data for U.S. imports from ***, using proprietary Customs records, and compiled from data submitted in response to Commission questionnaires.

Figure IV-4
Ferrovanadium: Apparent U.S. consumption, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

PART V: PRICING DATA

FACTORS AFFECTING PRICES

Raw material costs

The primary inputs used in production of ferrovanadium in the United States are spent catalysts from oil refineries and residuals from combustion of fuel oil, which are either processed into vanadium pentoxide (which can be further processed to produce ferrovanadium) or are processed directly into ferrovanadium and other products. Vanadium pentoxide (V_2O_5) also is imported into the U.S. for toll conversion into ferrovanadium. AMG produces ferrovanadium primarily using spent catalysts, while Bear converts vanadium pentoxide into ferrovanadium via an aluminothermic process.[1] Similar to Bear, Korean producers Korvan and Woojin convert vanadium pentoxide, imported primarily from China, into ferrovanadium.[2]

For U.S. producers AMG and Bear, raw materials as a share of the cost of goods sold ("COGS") decreased from *** percent in 2013 to *** percent in 2015. During January-September 2016, raw materials as a share of COGS was *** percent, compared to *** percent during the same period in 2015.[3]

Published price data indicate that ferrovanadium and vanadium pentoxide prices decreased by 55.7 and 62.6 percent, respectively, between January 2013 and December 2015 (figure V-1). Between December 2015 and December 2016, however, ferrovanadium and vanadium pentoxide prices increased by 89.8 percent and 108.8 percent, respectively.[4] Between December 2016 and February 2017, ferrovanadium and vanadium pentoxide prices increased further, by 7.0 percent and 3.8 percent respectively.

Figure V-1
Ferrovanadium and vanadium pentoxide: Prices, by month, January 2013-February 2017

* * * * * * *

Most firms (5 of 6 U.S. producers/tollees and 12 of 20 importers) reported that raw material prices have decreased since January 2013. Six importers and one U.S. producer/tollee reported that prices fluctuated, one importer reported that they did not change, and one

[1] Hearing transcript, pp. 13 (Anderson), 23-24 (Carey).

[2] *Ferrovanadium from China and South Africa, Inv. Nos. 731-TA-986-987 (Second Review)*, USITC Publication 5417, January 2015, p. IV-16. See also part VII of this report, pp. VII-4–VII-5.

[3] ***. For more information on the changes in raw material costs as a share of the COGS, see Part VI, footnote 8.

[4] Between January 2013 and September 2016, ferrovanadium and vanadium pentoxide prices decreased by 28.1 percent and 39.5 percent, respectively.

importer reported that they increased.[5] In general, firms noted that demand and prices for ferroalloys declined overall during January 2013-September 2016.

Transportation costs to the U.S. market

Transportation costs for ferrovanadium shipped from subject countries to the United States averaged 0.9 percent for Korea during 2015. These estimates were derived from official import data and represent the transportation and other charges on imports.[6]

U.S. inland transportation costs

Most responding U.S. producers/tollees (6 of 9) and importers (9 of 15) reported that they typically arrange transportation to their customers. U.S. producers/tollees reported that their U.S. inland transportation costs ranged from 0.5 to 2.0 percent, while most (5 of 6) importers reported costs of 1-2 percent. Importer *** reported a cost of 5.2 percent.

PRICING PRACTICES

Pricing methods

All U.S. producers/tollees reported using transaction-by-transaction negotiations for their sales of ferrovanadium, and four reporting selling through contracts. The majority of importers also reported selling transaction-by-transaction, while 8 of 22 reported selling through contracts (5 of these reported using both methods). Only one firm, ***, reported using set price lists.

Table V-1

Ferrovanadium: U.S. producers/tollees and importers reported price setting methods, by number of responding firms[1]

Method	U.S. producers/tollees	Importers
Transaction-by-transaction	9	18
Contract	4	8
Set price list	0	1
Other	0	0

[1] The sum of responses down may not add up to the total number of responding firms as each firm was instructed to check all applicable price setting methods employed.

Source: Compiled from data submitted in response to Commission questionnaires.

[5] The importer that reported an increase in raw material prices did not provide an explanation.

[6] The estimated transportation costs were obtained by subtracting the customs value from the c.i.f. value of the imports for 2015 and then dividing by the customs value based on the HTS subheading 7202.92.00.

One purchaser reported that it purchases product daily, two purchase weekly, ten purchase monthly, five purchase quarterly, and six purchase annually. Nine firms also reported purchasing in other frequencies: *** reported purchasing through multi-year contracts, *** reported purchasing through 2-year contracts, and a number of firms reported purchasing as needed based on demand or customer requirements. Twenty-two of 28 responding purchasers reported that their purchasing frequency had not changed since 2013. Most (19 of 26) purchasers reported contacting up to between three and six suppliers before making a purchase. One firm reported contacting only one firm, and one reported contacting between one and two. One reported contacting up to 7 firms, two reported contacting up to 10, one up to 15, one up to 16, and one firm reported contacting up to 20 firms before making a purchase.

Contract sales and spot sales

While only four of nine U.S. producers/tollees reported selling ferrovanadium under contract (***), the majority of the ferrovanadium sold in 2015 by quantity was via annual contract (for *** percent of U.S. producers/tollees' sales), followed by long-term contract (for *** percent of their sales) (table V-2). Two firms reported selling via long-term contract: ***. *** reported that its typical long-term contracts were for 730 days, and *** reported that its average long-term contracts are for "one year or more." Only one firm, ***, reported selling via short-term contract, for which it reported an average duration of "typically 1-2 quarters."

Table V-2

Ferrovanadium: Shares of U.S. producers/tollees' and importers' U.S. commercial shipments by type of sale, 2015

Type of sale	U.S. producers/tollees	Imports from Korea	Imports from all other sources
	Quantity (*1,000 pounds of contained vanadium*)		
Long-term contracts	***	***	***
Annual contracts	***	***	***
Short-term contracts	***	***	***
Spot sales	***	***	***
	Share (*percent*)		
Long-term contracts	***	***	***
Annual contracts	***	***	***
Short-term contracts	***	***	***
Spot sales	***	***	***
Total	100.0	100.0	100.0

Note.--Because of rounding, figures may not add to the totals shown.

Source: Compiled from data submitted in response to Commission questionnaires.

As shown in table V-2, importers of ferrovanadium from Korea reported selling mostly (*** percent) in the spot market. Only two responding importers reported selling via methods other than spot sales in 2015: ***. ***.[7] *** reported selling *** percent of its imports to end users. *** reported selling *** percent of its Korea-produced ferrovanadium in 2015 via annual contract to ***. Petitioners dispute ***.[8] Petitioners argue that the share of imports of Korean ferrovanadium reportedly sold in the spot market in 2015 (*** percent) is therefore too low.[9]

Like U.S.-produced ferrovanadium, most imports of ferrovanadium from nonsubject sources were sold via annual contract. Although only 3 of 13 reporting firms, ***, reported selling ferrovanadium from nonsubject sources via annual contract, ***, *** accounted for *** percent of the reported volume of nonsubject imports in 2015. *** reported selling the vast majority of its imports of ferrovanadium from nonsubject sources to end users, and *** reported selling all of its imports of ferrovanadium from nonsubject sources to end users.

Regarding contract provisions, *** reported that price could not be renegotiated during the contract period, the contracts fixed both price and quantity, and the contracts contained no meet-or-release provisions. For firms selling via annual contract, U.S. producer ***, ***, and *** reported that price could not be renegotiated during the contract period, and the contracts contained no meet or release provisions. *** also reported that its annual contracts fixed price. Importer *** reported that for its sales via ***, the contracts fixed quantity and price could not be renegotiated during the contract period. Regarding sales through long-term contract, *** reported that its typical long-term contracts were for *** days, and *** reported that its average long-term contracts are for "one year or more." *** reported that prices could not be renegotiated during the contract period, and that *** long-term contracts did not contain meet or release provisions.[10]

U.S. producers/tollees and importers were asked how contract prices are calculated and whether previously negotiated contracts influence prices for future contracts. No U.S. producers/tollees or importers reported that previously negotiated contracts influence prices for future contracts. Regarding the setting of contract prices, U.S. tollee *** reported indexing its contracts to Ryan's Notes minus a percentage discount, and *** reported setting prices based on mutual negotiation minus a discount (set by market dynamics) off an agreed upon publication. Importer *** reported basing its contract prices on market price plus costs such as freight and insurance plus a preferred profit margin, and importer *** reported setting its contracts prices through case-by-case independent negotiations. Importer of nonsubject ferrovanadium *** reported setting its contract prices based upon Ryan's Notes minus a discount plus a premium. *** petitioners reported that contract pricing terms for U.S. producers are usually based on the average of the prior month's Ryan's Notes published prices,

[7] ***.

[8] Petitioners' prehearing brief, pp. 30-31; Petitioners' posthearing brief, Attachment A pp. 9-10. *** it sells exclusively "***." ***, email message to USITC staff, March 23, 2017.

[9] ***.

[10] *** also reported selling imports of such ferrovanadium through long-term contract.

typically reduced by a discount negotiated with the mill.[11] Petitioners stated that typical long-term or annual contracts have pricing clauses that change every month based on these published prices.[12] They contend that the domestic industry's contract prices are therefore directly affected by changes in published spot market prices, and that the domestic industry's contract prices are vulnerable to the effects of declines in sport prices.[13]

Purchasers were also asked whether their distribution of contract vs. spot purchases differed by source. Four firms reported that there was no differentiation by source, while six firms reported that there was. Five of the six firms that reported differentiation by source (***) reported that either all or the majority of the domestic ferrovanadium they purchased was through contracts. Other sources of contract purchases were as follows: *** reported that its purchases from *** were via contract; *** reported that most of its purchases from *** were via annual contract, *** reported that its purchases from *** were via contract, *** reported that most of its contract purchases in 2015 (in addition to its purchases of domestic ferrovanadium) were from ***, and *** reported annual contract purchases from ***. Regarding the sources of spot purchases, *** reported purchasing on a spot basis from ***, *** reported that its spot purchasers were "from multiple different origins," *** reported that its only spot purchases in 2015 were from ***, and *** reported spot purchases from "the lowest priced bidder." Only one firm (***) specifically referenced spot purchases of domestic origin, which reported that all of the ferrovanadium it purchased on the spot market was either from domestic tollee Evraz or from traders (with ferrovanadium of unknown origin).

Additionally, purchasers were asked whether spot prices affect contract prices and whether contract prices affect spot prices, as well as how and to what extent. Most (16 of 25) responding purchasers reported that spot prices affect contract prices, while 8 of 25 purchasers reported that they do not; one firm, ***, selected both "yes" and "no" in response to this question, stating that "***." A number of these reported that contract prices are driven by indexes such as Ryan's Notes and that Ryan's Notes published prices are based on spot purchases. Two firms (***) also noted that contract prices can change on a month-to-month basis. Five of 24 purchasers reported that contract prices affect spot prices, while 18 reported that they do not; *** also selected both "yes" and "no" in response to this question, stating that "***." *** reported that many purchases are through contracts, and that this could lead to dormant or stagnant reporting of spot purchases; *** reported that contracts do not necessarily influence spot prices, but that contract tonnage can affect the size and liquidity of the spot market; *** reported that spot pricing could potentially be influenced by the tenure of the contract discussions; and *** reported that contract prices provide a starting point for the negotiation of spot prices, the extent of which depends upon supply and demand dynamics at

[11] Petitioners' prehearing brief, pp. 24-25.

[12] Hearing transcript, pp. 69-70 (Totaro).

[13] Hearing transcript, pp. 7 (Totaro), 15 (Anderson), 30-31, 51 (Lutz); Petitioners' posthearing brief, p. 4, Attachment A pp. 15-16.

the time. Petitioners stated that spot prices affect contract prices, but not the other way around.[14]

Ryan's Notes

Most U.S. producers/tollees and importers reported that ferrovanadium prices are indexed to one or more sources. Ryan's Notes is the most common index source, as reported by all six responding U.S. producers/tollees and 13 of 15 responding importers. One *** and two importers also reported indexing their prices to Platts Metal Weekly,[15] and two importers reported indexing its prices to official U.S. import statistics. Two U.S. producers/tollees and five importers also reported indexing their ferrovanadium prices to other sources; three firms (two importers and ***) reported using Metal Bulletin, one importer reported using American Metal Market ("AMM"), one importer reported using CRU and Argus, and one *** reported relying on metals broker experience. *** reported that its prices are based on published prices (using Ryan's Notes and Metal Bulletin) at the time of the sale.

According to CRU, the company that publishes Ryan's Notes data, its prices are based on spot sales ***.[16] It collects such data via twice-weekly market assessment calls ***, and publishes price updates twice weekly.[17] As discussed above, a number of purchasers also reported that the prices published by Ryan's Notes are based on spot purchases.

As shown in figure V-2, Ryan's Notes prices on a contained vanadium basis for grade 80 ferrovanadium in both the United States and the European Union show similar trends to published 70-80 percent ferrovanadium prices in the United States.[18] The Ryan's Notes published price for grade 80 ferrovanadium in the United States was at its highest in March 2013 at $*** per pound and lowest in January 2016 at $*** per pound of contained vanadium. Between January 2013 and December 2015, the price of grade 80 ferrovanadium in the United States decreased by *** percent. Between December 2015 and December 2016, the price increased by *** percent. Between December 2016 and February 2017, the price increased by *** percent.

[14] Hearing transcript, p. 75 (Anderson, Carey).

[15] Platts is an independent provider of information and benchmark prices for the commodities and energy markets. Available at http://marketing.platts.com/?elqPURLPage=226.

[16] ***, email message to USITC staff, April 4, 2017. See also CRU Prices, Bulk Ferroalloys, Methodology and Definitions Guide, March 2017, https://www.crugroup.com/media/1555/cru-prices-bulk-ferroalloys-methodology-and-definitions.pdf; and *CRU webpage*, http://www.crugroup.com/about-cru/our-approach/methodology/.

[17] Petitioners' prehearing brief, p. 24, Exhibit 9, Exhibit 11; Petitioners' posthearing brief, Attachment A pp. 2-3, 7-8.

[18] For more on published ferrovanadium prices, see "Raw material costs" in this section of the report.

Figure V-2
Ferrovanadium grade 80: CRU Ryan's Notes prices in the United States and the European Union, monthly average, January 2013-February 2017

* * * * * * *

Over the course of 2015, Ryan's Notes' average U.S. price of grade 80 ferrovanadium dropped ***. Petitioners assert that *** Korean imports were the primary driver of these price decreases. Petitioners argue that because contract prices are often based on the previous month's Ryan's Notes prices, spot prices have driven down annual contract prices via monthly price reductions in Ryan's Notes.[19]

Sales terms and discounts

Six U.S. producers/tollees reported quoting prices on a delivered basis, and five reported quoting prices on an f.o.b. basis. Of those, *** reported quoting prices on both a delivered and f.o.b. basis. ***. Eight importers reported quoting prices on a delivered basis, and six reported quoting prices on an f.o.b. basis. Of those, *** reporting quoting prices both ways.

Most firms (6 of 9 U.S. producers/tollees and 16 of 20 importers) reported offering no discounts. One U.S. producer/tollee (***) offers quantity discounts, two (***) offer total volume discounts, and one (***) reported offering discounts off of index pricing. Only two importers of ferrovanadium from Korea, ***, reported offering discounts. *** reported offering quantity discounts, and *** reported offering other discounts, but did not elaborate. *** reported offering total volume discounts. *** also reported also offering other discounts, stating that ***.

A majority of firms (6 of 9 U.S. producers/tollees and 9 of 14 importers) reported sales terms of net 30 days. *** reported cash sales. One *** and two importers also reported sales terms of net 60 days, *** reported that ***, and importer *** reported sales terms of net 15 days after release and net 20 days.

Price leadership

Six purchasers named price leaders in the ferrovanadium market. Five firms named Evraz, two named AMG, one named Duferco and Treibacher, and one firm named Glencore and Traxys. In explaining Evraz's price leadership, a number of firms pointed to Evraz's comparatively large market share.[20]

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[19] Hearing transcript, pp. 7-8 (Totaro), 15-16 (Anderson), 31-32 (Lutz); Petitioners prehearing brief, pp. 24-25, 30-34, Exhibit 9, Exhibit 11; Petitioners' posthearing brief, pp. 4-5, 8-9, Attachment A pp. 2.

[20] Evraz accounted for approximately *** percent of all (domestic and imported) reported U.S. commercial shipments of ferrovanadium during 2015, while AMG accounted for *** percent.

PRICE DATA

The Commission requested U.S. producers/tollees and importers to provide quarterly data for the total quantity and f.o.b. value of the following ferrovanadium products shipped to unrelated U.S. customers during January 2013 to September 2016.

Product 1.-- Ferrovanadium containing 40-60 percent vanadium, 2" by down

Product 2.— Ferrovanadium containing 75-85 percent vanadium, 2" by down

Nine U.S. producers/tollees and ten importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all quarters.[21] Pricing data reported by these firms accounted for approximately 89.2 percent of U.S. producers/tollees' shipments of ferrovanadium and 98.6 percent of U.S. shipments of subject imports from Korea in 2015.

Price data for products 1 and 2 are presented in tables V-3 to V-4 and figures V-3 to V-4. Nonsubject country prices are presented in Appendix D.

Table V-3

Ferrovanadium: Weighted-average f.o.b. prices and quantities of domestic and imported product 1 and margins of underselling/ (overselling), by quarter, January 2013-September 2016

* * * * * * *

Table V-4

Ferrovanadium: Weighted-average f.o.b. prices and quantities of domestic and imported product 2 and margins of underselling/(overselling), by quarter, January 2013-September 2016

* * * * * * *

Figure V-3

Ferrovanadium: Weighted-average prices and quantities of domestic and imported product 1, by quarter, January 2013-September 2016

* * * * * * *

[21] Per-unit pricing data are calculated from total quantity and total value data provided by U.S. producers/tollees and importers. The precision and variation of these figures may be affected by rounding, limited quantities, and producer or importer estimates.

Figure V-4

Ferrovanadium: Weighted-average prices and quantities of domestic and imported product 2,[1] by quarter, January 2013-September 2016

* * * * * * *

Price trends

In general, prices decreased during January 2013 to September 2016. Table V-5 summarizes the price trends, by country and by product. As shown in the table, domestic price decreases were *** percent for product 1 and *** percent for product 2 from January 2013 to September 2016. Import price decreases *** were *** percent from January 2013 to June 2016.

Table V-5

Ferrovanadium: Summary of weighted-average f.o.b. prices for products 1 and 2 from the United States and Korea

Item	Number of quarters	Low price (per pound of contained vanadium)	High price (per pound of contained vanadium)	Change in price[1] (percent)
Product 1				
United States	15	***	***	***
Korea	***	***	***	***
Product 2				
United States	15	***	***	***
Korea	***	***	***	***[2]

[1] Percentage change from the first quarter in which data were available to the last quarter in which price data were available.

[2] Prices change of product 2 from Korea from *** to ***.

Source: Compiled from data submitted in response to Commission questionnaires.

Petitioners argue that the price declines for ferrovanadium in 2015 were steeper than the contemporaneous declines in steel production and raw material prices, and that the primary driver of this decline was the increase in imports from Korean in each year of 2013-2015.[22] Respondent Korvan argues that the decrease in the price of raw material inputs and decrease in steel demand were the primary drivers of the decrease in ferrovanadium prices.[23]

[22] Hearing transcript, p. 11 (Totaro).

[23] Korvan's posthearing brief, pp. 6-7, 9-10.

Price comparisons

As shown in table V-6, prices for ferrovanadium imported from Korea were below those for U.S.-produced ferrovanadium in 10 of 14 instances (approximately 2.4 million pounds); margins of underselling ranged from 0.0 to 16.7 percent. In the remaining 4 instances (approximately 1.0 million pounds), prices for ferrovanadium from Korea were between 0.4 and 36.6 percent above prices for domestic ferrovanadium.

Table V-6

Ferrovanadium: Instances of underselling/(overselling) by Korean product and the range and average of margins, by pricing product, January 2013-September 2016

Source	Underselllling				
	Number of quarters	Quantity[1] (pounds of contained vanadium)	Average margin (percent)	Margin range (percent) Max	
				Min	Max
Product 1	***	***	***	***	***
Product 2	***	***	***	***	***
Total, underselling[2]	10	2,376,450	6.9	0.0	16.7
Source	(Overselllling)				
	Number of quarters	Quantity[1] (pounds of contained vanadium)	Average margin (percent)	Margin range (*percent*) Max	
				Min	Max
Product 1	***	***	***	***	***
Product 2	***	***	***	***	***
Total, overselling[2]	4	1,038,679	(12.8)	(0.4)	(36.6)

[1] These data include only quarters in which there is a comparison between the U.S. and subject product.
[2] On a year-by-year basis, *** of underselling (***) and *** of overselling (***) in 2013; *** of underselling (***) and *** of overselling in 2014; *** of underselling (***) and *** of overselling (***) in 2015; and *** of underselling (***) and *** of overselling (***) in 2016.

Source: Compiled from data submitted in response to Commission questionnaires.

LOST SALES AND LOST REVENUE

In the preliminary phase of the investigation, the Commission requested U.S. producers/tollees of ferrovanadium to report purchasers where they experienced instances of lost sales or revenue due to competition from imports of ferrovanadium from Korea during January 2013-September 2016. One U.S. producer, ***, submitted lost sales and lost revenue allegations. *** listed *** as a firm from which it lost sales, and *** as a firm from which it lost both sales and revenue. *** reported losing contract sales from *** and spot sales from both ***.

In the final phase of the investigation, of the eight responding U.S. producers/tollees, two reported that they had to reduce prices (***), and one reported that it had to roll back announced price increases (***). Two firms, ***, reported that they had lost sales.

Staff contacted 42 purchasers and received responses from 28 of them.[24] Responding purchasers reported purchasing approximately 15.7 million pounds of ferrovanadium (contained vanadium) during 2015 (table V-7).

Of the 26 responding purchasers, seven reported that they had purchased imported ferrovanadium from Korea instead of U.S.-produced product since 2013. Two of these purchasers reported that subject import prices were lower than U.S.-produced product,[25] and these same purchasers reported that price was a primary reason for the decision to purchase imported Korean product rather than U.S.-produced product. The reported estimated quantity these firms purchased from subject imports sources rather than domestic sources totaled 155,471 pounds (table V-8). Four of five responding purchasers identified availability as the main non-price reasons for purchasing imported rather than U.S.-produced ferrovanadium.

Of the 27 responding purchasers, 7 reported that U.S. producers/tollees had not reduced prices in order to compete with lower-priced imports from subject countries; 20 reported that they did not know (table V-9). No purchasers reported that U.S. producers/tollees had reduced prices in order to compete with lower-priced imports.

[24] Only one purchaser, ***, submitted a lost sales and lost revenue survey response in the preliminary phase of this investigation.

[25] Five purchasers reported that subject import prices were not lower than U.S.-produced product.

Table V-7

Ferrovanadium: Purchasers' responses to purchasing patterns

Purchaser	Purchases in 2015 (1,000 pounds contained vanadium)			Change in domestic share[1] (pp, 2013-15)	Change in subject country share[1] (pp, 2013-15)
	Domestic	Korea	All other		
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
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***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***[2]	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
Total	8,816	588	6,274	5.1	3.1

[1] Percentage points (pp) change: Change in the share of the firm's total purchases of domestic and/or subject country imports between first and last years.

[2] ***.

Source: Compiled from data submitted in response to Commission questionnaires.

Table V-8
Ferrovanadium: Purchasers’ responses to shifting supply sources

Purchaser	Purchased imports instead of domestic? (Y/N)	Imports priced lower? (Y/N)	If purchased imports instead of domestic, was price a primary reason		
			(Y/N)	If Yes, quantity purchased instead of domestic	If No, non-price reason
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
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***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
Total	**7 Yes/ 19 No**	**2 Yes/ 5 No**	**2 Yes/ 7 No**	**155,471**	

Source: Compiled from data submitted in response to Commission questionnaires.

Table V-9

Ferrovanadium: Purchasers' responses to U.S. producer price reductions

Purchaser	U.S. producers/tollees reduced priced to compete with subject imports (Y/N)	If U.S. producers/tollees reduced prices	
		Estimated U.S. price reduction (percent)	Additional information, if available
AK Steel	***	***	***
Ametek	***	***	***
ArcelorMittal	***	***	***
CAI	***	***	***
Carpenter	***	***	***
Cascade	***	***	***
CCMA	***	***	***
Charter	***	***	***
CMC	***	***	***
Crucible	***	***	***
DJJ	***	***	***
Ellwood	***	***	***
F. W. Winter	***	***	***
Finkl	***	***	***
Gerdau	***	***	***
HicWilCo	***	***	***
JuliMar	***	***	***
Millbank	***	***	***
Powmet	***	***	***
ProFound	***	***	***
SSAB	***	***	***
Standard Steel	***	***	***
Steel Dynamics	***	***	***
Timken	***	***	***
Union Electric	***	***	***
US Steel	***	***	***
Veritas	***	***	***
Whemco	***	***	***
Total	**7 No/ 20 Don't Know**	**0.0**	

Source: Compiled from data submitted in response to Commission questionnaires.

In its response to the lost sales lost revenue survey in the preliminary phase of this investigation, *** reported that all purchases of ferrovanadium are made on a competitive bid basis and, in most cases, the source of the ferrovanadium is not known at the time of the bid. In additional comments, two other purchasers (***) reported that country sources are often unknown or of little interest to purchasers.

PART VI: FINANCIAL EXPERIENCE OF U.S. PRODUCERS

BACKGROUND

AMG and Bear provided financial data on their operations producing and selling ferrovanadium and Bear[1] provided data on its operations toll-producing ferrovanadium from toller-provided raw material inputs.[2] Tollee firms, including CCMA, Energy Fuels, Evraz Stratcor, Glencore, Gulf, and Traxys, also provided financial data on their operations selling ferrovanadium that Bear toll-produced on their behalf (discussed later in this section of the report). For a more detailed description of the domestic producers' manufacturing processes, including a discussion of the vanadium-bearing inputs, see the discussion in Part I of this report.

OPERATIONS ON FERROVANADIUM BY AMG AND BEAR

This section of the report presents data on the commercial operations of AMG and Bear together with Bear's tolling operations and then presents those same data for the two firms separately (tables VI-1 and VI-2). Commercial sales *** rose *** between 2013 and 2014 and declined in 2015, largely reflecting lower quantities and unit sales values. January-September 2016 ("interim 2016") commercial sales quantity was greater than in January-September 2015

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[1] Firms reported on the basis of a calendar year and both reported that their financial statements are based on U.S. generally accepted accounting principles. Both AMG and Bear produce ferrovanadium but use different process routes. AMG uses a pyrometallurgical reduction process using spent oil refinery catalysts, power plant residues and ash, and other sources. Hearing transcript, p. 13 (Anderson). Bear uses an aluminothermic process converting tollee-supplied vanadium pentoxide. Hearing transcript, p. 23 (Carey).

AMG Vanadium, LLC is a U.S. subsidiary of AMG Advanced Metallurgical Group N.V., a multinational company domiciled in the Netherlands. ***. Following the Commission's hearing, ***.

Bear was owned by Gulf and both were subsidiaries of Eramet. (See discussion later in this section regarding Gulf.) Within the Eramet corporate structure Bear was responsible for converting vanadium pentoxide, which Gulf converted from refinery spent catalysts, into ferrovanadium, which Gulf then sold. Reportedly, because Gulf was not able to provide sufficient vanadium pentoxide to keep Bear at full production, Bear toll-produced ferrovanadium on behalf of other firms, from vanadium oxides produced or imported by these firms. Gulf and Bear filed petitions for relief under Chapter 11 of the U.S. Bankruptcy Code in June 2016; in October 2016, Bear was sold to Yilmaden Holding, which then formed Evergreen Metallurgical d/b/a Bear Metallurgical. Petitioners' prehearing brief, exh. 1 and 2.

[2] The operations of producers differ from those of tollees. The tollee provides the raw material inputs (here, vanadium pentoxide) to the toller, retaining title to the inputs, and the toller returns a guaranteed percentage of the input as finished product (here, ferrovanadium) to the tollee. The toller converts the input to the finished product and charges a tolling fee, which differs in concept and unit value from sales, and may arrange packaging and shipment on behalf of the tollee. Bear is contractually obligated to return a specified percentage of vanadium contained in the tollee-supplied vanadium pentoxide; Bear's commercial shipments are the excess of the guaranteed return from its tolling operations.

("interim 2015") but the per-pound and absolute values were lower. Bear's tolling *** from 2013 to 2015 on a quantity and value basis, and was lower in interim 2016 than in interim 2015. Total COGS increased as did selling, general and administrative ("SG&A") expenses; both categories of costs were lower in interim 2016 than in interim 2015. Gross profit, operating income, and net income increased *** between 2013 and 2014, but were lower in 2015 and in interim 2016 compared with interim 2015. Cash flow followed the changes in net income.

Table VI-1
Ferrovanadium: Results of operations of AMG and Bear, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

Table VI-2
Ferrovanadium: Results of operations of AMG and Bear, by firm, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

Net sales and tolling

As may be seen from the data in table VI-1, commercial sales rose *** from 2013 to 2014 and were lower in 2015; they were lower in interim 2016 compared with interim 2015. As presented in table VI-2, AMG's commercial sales (by value) account for the *** of the data presented.[3] Bear's commercial sales and transfers combined (by quantity and value ***.[4] Total sales and tolling were ***.

Costs and expenses

Total COGS rose between 2013 and 2014, increased *** in 2015, and were lower in interim 2016 compared with interim 2015. The changes in total COGS (particularly the increased value from 2013 to 2015 but a lower value in interim 2016 compared with interim 2015) mostly reflected *** as can be seen in table VI-2. The data ***.[5] Three items in particular affected the changes in ***: (1) an ***;[6] (2) ***;[7] and (3) ***.[8] ***.[9] Cumulated raw material

[3] ***.
[4] ***.
[5] ***.
[6] In general, ***.
[7] ***.
[8] ***.
[9] ***.
***.

costs of AMG and Bear were ***. Cumulated SG&A expenses of AMG and Bear rose irregularly from 2013 to 2015, accounted for ***.

Profitability

Gross profit, operating income, and net income each ***. The increase in sales revenue (***) between 2013 and 2014 was much greater than the increase in total costs and expenses. In 2015, sales quantity declined while sales unit value and sales value fell whereas costs and expenses remained ***. Each of the three profitability indicators was lower in interim 2016 than in interim 2015.

Variance analysis

Given the *** in unit sales values and cost structure between Bear and AMG, a variance analysis is not presented. Variance analyses are useful in quantifying the effects of changes in volume, unit prices, and unit costs on operating profitability when the product mix is generally homogeneous. As shown by the data in tables VI-1 and VI-2, that is not the case.

CAPITAL EXPENDITURES AND RESEARCH AND DEVELOPMENT EXPENSES

The capital expenditures and research and development (R&D) expenses of AMG and Bear are presented in table VI-3. Total capital expenditures fell irregularly from 2013 to 2015 but were *** higher in interim 2016 compared with interim 2015. These changes were from ***.

Table VI-3
Ferrovanadium: Capital expenditures and R&D expenses of AMG and Bear, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

The Commission's questionnaire requested responding firms to describe the nature, focus, and significance of the firm's capital expenditures and R&D expenses. AMG responded "***."[10] Bear stated ***."[11] The firm stated with respect to its R&D expenses "***.[12]

[10] ***.

[11] ***. Petitioners' postconference brief described projects in 2013-15. In 2013, ***. Petitioners' postconference brief, answers to questions by staff, question 13, pp. 21-22.

[12] ***." ***.

ASSETS AND RETURN ON INVESTMENT

The assets of AMG and Bear and the ratio of operating income to such assets are presented in table VI-4. This ratio mirrored the trends of the operating income and net income to sales ratio as presented in tables VI-1 and VI-2.

Table VI-4
Ferrovanadium: Total assets and ratio of operating income to assets of AMG and Bear, 2013-15

* * * * * * *

CAPITAL AND INVESTMENT

The Commission requested U.S. producers of ferrovanadium to describe any actual or potential negative effects on their return on investment or their growth, investment, ability to raise capital, existing development and production efforts (including efforts to develop a derivative or more advanced version of the product), or the scale of capital investments as a result of imports of ferrovanadium from Korea. Table VI-5a tabulates the responses on actual negative effects on investment, growth and development while table VI-5b presents responses on actual negative effects on growth of domestic producers.

Table VI-5a
Ferrovanadium: Negative effects of imports from subject sources reported by AMG and Bear on investment, growth, and development since January 1, 2013

* * * * * * *

Table VI-5b
Ferrovanadium: Narrative comments by AMG and Bear relating to actual and anticipated negative effects of imports on investment and growth and development since January 1, 2013

* * * * * * *

CONSOLIDATED FERROVANADIUM OPERATIONS OF AMG, BEAR, AND TOLLEES

The consolidated ferrovanadium operations of AMG, Bear, and tollee firms (CCMA, Energy Fuels, Evraz Stratcor, Glencore, Gulf, and Traxys) are presented in table VI-6. These data differ from those in table VI-1 in that they consist of the commercial sales revenues earned and costs incurred by AMG, Bear, and tollee firms in selling ferrovanadum to independent third parties. In other words, while table VI-1 includes the revenues earned by Bear in toll-converting the raw materials provided by the tollee, table VI-6 instead substitutes the revenues earned by the tollee firms selling the finished ferrovanadium to other parties. Evraz[13] and Gulf[14] processed

[13] Evraz Stratcor, which primarily produced vanadium-aluminum master alloys during 2013-16, also produced vanadium pentoxide from recycled catalyst; more recently the firm has acted as a wholeseller (*continued*...)

spent refinery catalysts. These firms charge the suppliers of these catalysts, chiefly petroleum refiners, for recycling the catalyst but reduce the recycling charge by a credit that is based on the current market value of the metals contained in the catalyst. Petitioners stated that as a result of declining vanadium prices (the credit), instead of choosing to recycle a refiner might choose a less expensive option and send the spent catalyst waste to a landfill.[15] These two firms, like the tollee firms, provided Bear with raw material inputs, chiefly in the form of vanadium pentoxide, and received back the converted ferrovanadium. AMG also processes inputs, including catalysts and slag, as indicated in Part I of this report; [16] AMG produces ferrovanadium unlike Evraz Stratcor and Gulf, which produce vanadium pentoxide.[17]

Table VI-6
Ferrovanadium: Results of operations of AMG, Bear, and U.S. tollee firms, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

(…*continued*)
of ferrovanadium produced by Bear from raw materials supplied by Evraz Metals North America ("EMNA"). The Evraz Group, S.A. purchased a *** interest in Strategic Minerals Corporation (the parent company of Stratcor, Inc.) in 2006, becoming Evraz Stratcor. The existing tolling arrangement between Evraz Stratcor and Bear was joined by East Metals AG. That firm's subsidiary, EMNA arranged the tolling of Evraz Group vanadium oxides at Bear and sold ferrovanadium. EMNA was merged into Evraz Stratcor effective July 1, 2014. Also *see* Petitioners' posthearing brief, app. A, p. 13.

[14] Gulf owned 100 percent of Bear and both firms were subsidiaries of Eramet. Within the corporate structure of Eramet, Gulf was responsible for the production of the raw materials by recycling vanadium oxides and other metals from spent oil catalysts, while Bear was responsible for converting vanadium pentoxide into ferrovanadium, which Gulf then sold. Reportedly, because Gulf was not able to provide sufficient vanadium pentoxide to keep Bear at full production, Bear toll-produced ferrovanadium on behalf of other firms, from vanadium oxides produced or imported by these firms. Of the six tollee firms reporting data, Gulf accounted for the following percentages of ferrovanadium sales by Bear's tollees, by quantity: ***.

Gulf and Bear filed petitions for relief under Chapter 11 of the U.S. Bankruptcy Code in June 2016. While Bear has emerged from bankruptcy following its acquisition by Yilmaden Holding, Gulf continues to operate and was selling vanadium pentoxide to an independent party which toll-converts with Bear. Hearing transcript, p. 48 (Totaro). As of March 2017, Gulf had not found a buyer for its business. In November 2016, Gulf announced its intention to begin idling its production facility. While it continues to seek a buyer, it also continues to operate the facility and sell vanadium products to its customers. Petitioners' prehearing brief, exh. 1 and 2.

[15] Petition, pp. 42-43. In petitioners' postconference brief, answers to questions by staff, question 10, pp. 16-17, ***.

[16] ***.

[17] Petitioners responded to a question asked at the hearing to discuss why specific domestic shippers of ferrovanadium reported increased shipments while others reported substantial decreases in their shipments. Petitioners' posthearing brief, app. A, pp. 19-21.

The trends in tables VI-1 and VI-6 are substantially the same but the absolute values and per-unit values are higher in table VI-6, a reflection of the open market sales values and fully loaded costs in table VI-6, which results in a more representative presentation of a single entity's revenues matched with its production costs. The sales quantities in table VI-6 do not match the sales quantities in table VI-1 because: (1) several firms are included in Bear's tolling data but did not provide shipment or financial information to the Commission; (2) timing differences between tolling and the subsequent commercial sales; and (3) changes in inventory held by the commercial seller. Nonetheless, the differences in quantity between the data in tables VI-1 and VI-6 are small. The differences between the value data in tables VI-1 and VI-6 reflect the commercial sales of tollee firms.

As indicated by the data in table VI-6, the quantity and value of total net sales rose from 2013 to 2014 and fell in 2015, reflecting the lower sales quantity combined with a lower unit sales value. Quantity, value, and average unit value of sales were lower in interim 2016 compared with interim 2015. Although the trends in the data of table VI-6 are similar to those of table VI-1, the quantity and value of commercial sales reported by tollee firms fell steadily between each of the yearly periods and were lower in interim 2016 compared with interim 2015. Hence, the ***. Similarly, ***.

Total COGS[18] increased slightly from 2013 to 2014 but decreased in 2015 to a higher amount than in 2013. Total COGS of *** from 2013 to 2015, although it rose from *** of sales between 2013 and 2015.[19] The increase in total COGS from 2013 to 2015 reflects the data of non-tollee firms, ***. Total COGS were sharply lower in interim 2016 than in interim 2015. This reflects the data of ***. SG&A expenses decreased from 2013 to 2015 and such costs were higher in interim 2016 than in interim 2015. Over this period the ***.

These changes in sales value and costs translated into a *** increase in operating income in 2014 from 2013 but a *** decline in operating income to a loss in 2015. Likewise, operating income in interim 2016 was higher than the loss in interim 2015. ***.

[18] See notes to table VI-6. Raw material costs are ***. "Other costs" include direct labor and other factory costs ***. Conversion charges are those reported by tollee firms. ***.

[19] The per-unit value of raw material costs reported by tollee firms fell from 2013 to 2015 and was much lower in interim 2016 compared with interim 2015. Toll conversion fees increased between 2013 and 2015 but were lower in interim 2016 compared with interim 2015. Tollee firms' raw material costs rose as a share of sales from *** from 2013 to 2015 and toll conversion costs rose as a share of sales from ***. The increased shares reflected changes in their sales quantity and per-pound value of sales.

Table VI-7 presents the responses of tollee firms with respect to actual or potential negative effects on their return on investment or their growth, investment, ability to raise capital, existing development and production efforts (including efforts to develop a derivative or more advanced version of the product), or the scale of capital investments as a result of imports of ferrovanadium from Korea.

Table VI-7
Ferrovanadium: Negative effects of imports from subject sources reported by U.S. tollee firms on investment, growth, and development since January 1, 2013

* * * * * * *

PART VII: THREAT CONSIDERATIONS AND INFORMATION ON NONSUBJECT COUNTRIES

Section 771(7)(F)(i) of the Act (19 U.S.C. § 1677(7)(F)(i)) provides that—

> *In determining whether an industry in the United States is threatened with material injury by reason of imports (or sales for importation) of the subject merchandise, the Commission shall consider, among other relevant economic factors*[1]*--*
>
> *(I) if a countervailable subsidy is involved, such information as may be presented to it by the administering authority as to the nature of the subsidy (particularly as to whether the countervailable subsidy is a subsidy described in Article 3 or 6.1 of the Subsidies Agreement), and whether imports of the subject merchandise are likely to increase,*
>
> *(II) any existing unused production capacity or imminent, substantial increase in production capacity in the exporting Korea indicating the likelihood of substantially increased imports of the subject merchandise into the United States, taking into account the availability of other export markets to absorb any additional exports,*
>
> *(III) a significant rate of increase of the volume or market penetration of imports of the subject merchandise indicating the likelihood of substantially increased imports,*
>
> *(IV) whether imports of the subject merchandise are entering at prices that are likely to have a significant depressing or suppressing effect on domestic prices, and are likely to increase demand for further imports,*
>
> *(V) inventories of the subject merchandise,*

---

[1] Section 771(7)(F)(ii) of the Act (19 U.S.C. § 1677(7)(F)(ii)) provides that "The Commission shall consider {these factors} . . . as a whole in making a determination of whether further dumped or subsidized imports are imminent and whether material injury by reason of imports would occur unless an order is issued or a suspension agreement is accepted under this title. The presence or absence of any factor which the Commission is required to consider . . . shall not necessarily give decisive guidance with respect to the determination. Such a determination may not be made on the basis of mere conjecture or supposition."

(VI) the potential for product-shifting if production facilities in the foreign Korea, which can be used to produce the subject merchandise, are currently being used to produce other products,

(VII) in any investigation under this title which involves imports of both a raw agricultural ferrovanadium(within the meaning of paragraph (4)(E)(iv)) and any ferrovanadium processed from such raw agricultural product, the likelihood that there will be increased imports, by reason of ferrovanadium shifting, if there is an affirmative determination by the Commission under section 705(b)(1) or 735(b)(1) with respect to either the raw agricultural ferrovanadium or the processed agricultural ferrovanadium(but not both),

(VIII) the actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the domestic like product, and

(IX) any other demonstrable adverse trends that indicate the probability that there is likely to be material injury by reason of imports (or sale for importation) of the subject merchandise (whether or not it is actually being imported at the time).[2]

Information on the volume and pricing of imports of the subject merchandise is presented in *Parts IV* and *V*; and information on the effects of imports of the subject merchandise on U.S. producers' existing development and production efforts is presented in *Part VI*. Information on inventories of the subject merchandise; foreign producers' operations, including the potential for "product-shifting;" any other threat indicators, if applicable; and any dumping in third-Korea markets, follows. Also presented in this section of the report is information obtained for consideration by the Commission on nonsubject countries.

[2] Section 771(7)(F)(iii) of the Act (19 U.S.C. § 1677(7)(F)(iii)) further provides that, in antidumping investigations, ". . . the Commission shall consider whether dumping in the markets of foreign countries (as evidenced by dumping findings or antidumping remedies in other WTO member markets against the same class or kind of merchandise manufactured or exported by the same party as under investigation) suggests a threat of material injury to the domestic industry."

THE INDUSTRY IN KOREA

Overview

The Korean ferrovanadium industry experienced marked production growth in 2015, consistent with rising levels of exports. Exports to the United States increased by *** between 2013 and 2015, while exports to other markets increased by ***.

The Commission requested data from 10 firms believed to produce and/or export ferrovanadium from Korea to the United States.[3] Useable responses to the Commission's questionnaire were received from three firms: Fortune Metallurgical ("Fortune"), a Chinese-based trading company and exporter of ferrovanadium from Korea, as well as Korvan, and Woojin, both Korean producers of ferrovanadium. These firms' exports to the United States accounted for virtually all U.S. imports of ferrovanadium from Korea in 2015. According to estimates requested of the responding Korean producers, the production of ferrovanadium in Korea discussed in this part of the report accounts for the majority of the overall production of ferrovanadium in Korea. Staff believes that Korvan and Woojin are the primary producers of ferrovanadium in Korea.[4]

Table VII-1 presents information on the ferrovanadium operations of the responding producers and exporters in Korea. Korvan and Fortune (***) accounted for approximately *** percent of all reported Korean exports to the United States in 2015.[5]

Table VII-1
Ferrovanadium: Summary data on firms in Korea, 2015

Firm	Production (1,000 pounds contained vanadium)	Share of reported production (percent)	Exports to the United States (1,000 pounds contained vanadium)	Share of reported exports to the United States (percent)	Total shipments (1,000 pounds contained vanadium)	Share of firm's total shipments exported to the United States (percent)
Korvan	***	***	***	***	***	***
Woojin	***	***	***	***	***	***
Total	***	***	***	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

[3] These firms were identified through a review of information submitted in the petition and contained in *** records.

[4] *** each estimated that their share of total production of ferrovanadium in Korea accounted for *** and ***, respectively. Foreign Producers' questionnaire responses, section II-6. "***." Email from ***, February 24, 2017.

[5] Fortune Metallurgical is a Chinese-based trading company, which exports ferrovanadium ***.

Both Korvan and Woojin convert vanadium pentoxide, imported primarily from China, into ferrovanadium.[6] *** purchases raw materials from both China and Brazil. In 2015, *** purchased 1, 395 metric tons (nearly 3.1 million pounds) of vanadium pentoxide from China and 40 metric tons (approximately 88 thousand pounds) from Brazil. *** indicated it generally purchases the raw materials on a monthly basis depending on sales volume and market price.[7] China remains the primary raw material source for Korean ferrovanadium exported to the United States.

No Korean producer reported any changes in operations since January 2013. *** indicated that production increased in 2015 because of growing ferrovanadium consumption from local and overseas specialty steel mills, and ***.[8]

Table VII-2 presents data on the industry in Korea. Data was obtained by two Korean producers, Korvan and Woojin, believed to account for all known production of ferrovanadium in Korea.[9] [10] The Korea industry's capacity remained consistent, while total production increased by *** percent between 2013 and 2015. The increase in production coincided with ***. Export shipments to the United States rose from 2013 to 2015, reflecting a *** percent increase. Total shipments increased by *** percent, as total exports increased by *** percent between 2013 and 2015 while home market shipments declined. As a ratio, the capacity utilization reported increased by *** percentage points between 2013 and 2015.

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[6] *Ferrovanadium from China and South Africa, Inv. Nos. 731-TA-986-987 (Second Review)*, USITC Publication 5417, January 2015, p. IV-16.

[7] Email from ***, April 3, 2017.

[8] *** foreign producers' questionnaire response, section II-6.

[9] In its preliminary-phase submission, *** correctly reported its shipments of toll production back to tollees mutually exclusive of other shipment categories, such that its inventories, production, and total shipments were balanced. As it reported in the preliminary phase, its tollees were ***, indicating that classifying those shipments in the "toll production returned to tollee" line were undercounting "exports to the United States" and "exports to all other markets." In its final phase submission, since the "toll production returned to tollee" line was removed from the data collection, *** correctly provided the data as requested regardless of whether it was a toll arrangement or not, so shipments to *** are now properly reported as export shipments.

[10] In its preliminary-phase submission, *** incorrectly reported its shipments of toll production back to tollees were not mutually exclusive of other shipment categories, such that its inventories, production, and total shipments were not balanced. As it reported its preliminary phase submission, the reasons inventories, production, and shipments did not balance was that "***", i.e., there was double counting of shipments. In its final-phase submission, since the "toll production returned to tollee" line was removed from the data collection, ***'s submitted data no longer suffer from the reconciliation problems, however, *** average production capacity has been adjusted for its revised data set.

Table VII-2
Ferrovanadium: Data on industry in Korea, 2013-15, January-September 2015, January-September 2016, and projections for calendar years 2016-17

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* * * * * * *

Table VII-3 presents Korean producers' share of production and exports to the United States, by grade for 2015. Nearly all reported production and all reported exports to the United States in 2015 were 75-85 percent contained vanadium. Korvan and Woojin combined to produce *** of the 50 percent grade vanadium, compared to approximately *** of the 80 percent grade vanadium in 2015. There were no exports of the *** percent grade vanadium in 2015.

Table VII-3
Ferrovanadium: Korean producers' share of production and exports to the United States, by grade, 2015

Item	Production by grade	Exports to the United States
	Share of quantity (percent)	
40-60 percent vanadium content	***	***
75-85 percent vanadium content	***	***
Other grades	***	***
Total Korean production	***	***

Note.—*** produced a very small amount of the 40-60 percent ferrovanadium in 2015.

Source: Compiled from data submitted in response to Commission questionnaires.

Changes in operations and alternative products

Table VII-4 presents data on the overall capacity and production on the same equipment by producers in Korea. Between 2013 and 2015, the overall capacity in Korea remained constant, while production of both ferrovanadium and other products increased.[11] Overall capacity utilization increased by *** percentage points between 2013 and 2015, and total production on the same machinery increased by *** percent during 2013-15. The share of ferrovanadium production increased by *** percentage points, while out-of-scope production decreased by ***.

Table VII-4
Ferrovanadium: Overall capacity and production on the same equipment as in-scope production by producers in Korea, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

[11] ***. These other products were the majority of *** production. *** did not indicate any other products. *** foreign producer questionnaire, section II-4a.

Table VII-5 presents data on exports from Korea to leading destination markets. From 2013 to 2015, exports from Korea to the United States increased in quantity by 144.7 percent and in value by 89.0 percent. Decreases in the overall quantity and value of exports from 2015 to 2016 reflected the decline in exports to the United States to approximately one tenth of their 2015 levels in both quantity and value.

Table VII-5
Ferrovanadium: Exports from Korea by destination market, 2013-16

Destination market	Calendar year			
	2013	2014	2015	2016
	Quantity (1,000 pounds)			
Exports from Korea to the United States	913	1,746	2,234	239
Exports from Korea to other major destination markets.--				
Netherlands	561	434	2,415	3,007
Japan	831	255	324	1,314
Bahrain	0	176	44	307
Taiwan	231	77	44	287
Belgium	0	138	390	283
Italy	169	110	0	132
Turkey	22	22	37	132
India	9	66	165	88
All other destination markets	163	30	1,141	228
Total Korea exports	2,899	3,054	6,795	6,017
	Value (1,000 dollars)			
Exports from Korea to the United States	8,324	15,896	15,729	1,301
Exports from Korea to other major destination markets.--				
Netherlands	5,413	3,909	17,206	18,762
Japan	7,064	1,880	1,942	7,082
Bahrain	0	1,575	308	1,709
Taiwan	2,198	699	347	1,560
Belgium	0	1,294	2,524	1,647
Italy	1,537	975	0	827
Turkey	247	188	193	810
India	91	615	831	555
All other destination markets	1,558	284	8,321	1,354
Total Korea exports	26,431	27,314	47,401	35,608

Table continued on next page.

Table VII-5--Continued
Ferrovanadium: Exports from Korea by destination market, 2013-16

Destination market	Calendar year			
	2013	2014	2015	2016
	Unit value (dollars per pound)			
Exports from Korea to the United States	9.11	9.11	7.04	5.44
Exports from Korea to other major destination markets.--				
Netherlands	9.65	9.00	7.12	6.24
Japan	8.50	7.38	5.99	5.39
Bahrain	---	8.94	6.99	5.57
Taiwan	9.49	9.05	7.86	5.44
Belgium	---	9.39	6.47	5.82
Italy	9.09	8.90	---	6.26
Turkey	11.20	8.52	5.18	6.13
India	10.33	9.29	5.03	6.29
All other destination markets	9.55	9.33	7.30	5.95
Total exports from Korea	9.12	8.94	6.98	5.92
	Share of quantity (percent)			
Exports from Korea to the United States	31.5	57.2	32.9	4.0
Exports from Korea to other major destination markets.--				
Netherlands	19.3	14.2	35.5	50.0
Japan	28.6	8.3	4.8	21.8
Bahrain	0.0	5.8	0.6	5.1
Taiwan	8.0	2.5	0.6	4.8
Belgium	0.0	4.5	5.7	4.7
Italy	5.8	3.6	0.0	2.2
Turkey	0.8	0.7	0.5	2.2
India	0.3	2.2	2.4	1.5
All other destination markets	5.6	1.0	16.8	3.8
Total exports from Korea	100.0	100.0	100.0	100.0

Note.-- IHS/GTA data reported in kilograms and converted into thousands of pounds.

Source: Official Korean exports statistics under HTS subheading 7202.92 as reported by Korea Customs and Trade Development Institution in the IHS/GTA database, accessed March 22, 2017.

U.S. INVENTORIES OF IMPORTED MERCHANDISE

Table VII-6 presents data on U.S. importers' reported inventories of ferrovanadium. Between 2013 and 2015, U.S. importers' inventories and ratios increased by every measure. The increase in inventories of ferrovanadium from Korea largely reflected holdings by ***.[12]

Table VII-6
Ferrovanadium: U.S. importers' inventories, 2013-15, January-September 2015, and January-September 2016

* * * * * * *

U.S. IMPORTERS' OUTSTANDING ORDERS

Table VII-7 presents data on arranged imports of ferrovanadium from Korea and nonsubject sources. The Commission requested importers to indicate whether they imported or arranged for the importation of ferrovanadium from Korea after October 1, 2016. There were no outstanding orders or arranged imports scheduled from Korea, and no actual U.S. imports from Korea arrived during the October-December 2016 months. U.S. importers had arranged for over *** pounds of contained vanadium from nonsubject sources through March 2017 and another *** pounds through September 2017.

Table VII-7
Ferrovanadium: Arranged imports (quantity in 1,000 pounds contained vanadium), quarterly October 2016 through September 2017

Item	Period				
	Oct-Dec 2016	Jan-Mar 2017	Apr-Jun 2017	Jul-Sept 2017	Total
Korea	0	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***

Note.—Official U.S. import statistics indicated zero imports from Korea during October-December 2016. Nonsubject sources and all import sources' October-December 2016 data were updated based on official U.S. import statistics.

Source: Compiled from official U.S. import statistics, using statistical reporting number 7202.92.0000, accessed March 7, 2017, and adjusted to include suppressed quantity data for U.S. imports from ***, using proprietary Customs records. Arranged imports from January-September 2017 were compiled from data submitted in response to Commission questionnaires.

[12] *** indicated that its increased inventories were largely due to market conditions. "***." *** importer questionnaire response, section III-22.

ANTIDUMPING OR COUNTERVAILING DUTY ORDERS IN THIRD-KOREA MARKETS

There are no known trade remedy actions on ferrovanadium in third-country markets.

INFORMATION ON NONSUBJECT COUNTRIES

As previously discussed in Part IV, the three largest nonsubject sources of ferrovanadium during 2013-15 were Austria, Canada, and the Czech Republic. Those three countries were the source of 93 percent of U.S. nonsubject imports of ferrovanadium during 2013-15. The industries in those three countries are discussed below.

The industry in Austria

There is a single producer of ferrovanadium in Austria, Treibacher Industrie AG, which is an integrated producer of ferrovanadium, processing vanadium slag to recover vanadium pentoxide and refining the vanadium pentoxide to produce ferrovanadium and vanadium chemicals and other alloys.[13] Treibacher also produces numerous alloys and chemicals of other metallic elements. As shown in Table VII-8, exports from Austria are primarily to other European countries and to Korea.

[13] Treibacher, http://www.treibacher.com/en/products/ferro-alloys.html , accessed Feb. 20, 2017.

Table VII-8
Ferrovanadium: Exports from Austria by destination market, 2013-16

Destination market	Calendar year			
	2013	2014	2015	2016
	Quantity (1,000 pounds)			
Exports from Austria to the United States	1,408	1,355	2,135	(1)
Exports from Austria to other major destination markets.--				(1)
Germany	5,568	6,462	5,477	
South Korea	2,601	2,884	2,081	(1)
Netherlands	768	590	1,273	(1)
Slovenia	548	717	685	(1)
Brazil	583	375	661	(1)
Turkey	659	838	657	(1)
Italy	641	846	611	(1)
Czech Republic	551	507	441	(1)
All other destination markets	2,495	2,831	1,914	(1)
Total Austria exports	15,822	17,403	15,934	(1)
	Value (1,000 dollars)			
Exports from Austria to the United States	11,017	11,785	12,468	(1)
Exports from Austria to other major destination markets.--				(1)
Germany	49,924	50,654	35,370	
South Korea	24,013	25,308	14,095	(1)
Netherlands	4,729	3,800	7,990	(1)
Slovenia	5,235	6,348	4,629	(1)
Brazil	5,781	3,343	4,845	(1)
Turkey	6,657	7,671	4,963	(1)
Italy	6,063	7,423	4,262	(1)
Czech Republic	5,510	4,565	3,101	(1)
All other destination markets	26,490	24,801	14,452	(1)
Total Austria exports	145,419	145,700	106,175	(1)

Table continued on next page.

Table VII-8--Continued
Ferrovanadium: Exports from Austria by destination market, 2013-16

Destination market	Calendar year			
	2013	2014	2015	2016
	Unit value (dollars per pound)			
Exports from Austria to the United States	7.82	8.70	5.84	(1)
Austria exports to other major destination markets.--				(1)
Germany	8.97	7.84	6.46	
South Korea	9.23	8.78	6.77	(1)
Netherlands	6.16	6.44	6.28	(1)
Slovenia	9.55	8.86	6.76	(1)
Brazil	9.92	8.92	7.33	(1)
Turkey	10.10	9.16	7.55	(1)
Italy	9.46	8.78	6.97	(1)
Czech Republic	10.00	9.00	7.03	(1)
All other destination markets	10.62	8.76	7.55	(1)
Total Austria exports	9.19	8.37	6.66	(1)
	Share of quantity (percent)			
Exports from Austria to the United States	8.9	7.8	13.4	(1)
Exports from Austria to other major destination markets.--				(1)
Germany	35.2	37.1	34.4	
South Korea	16.4	16.6	13.1	(1)
Netherlands	4.9	3.4	8.0	(1)
Slovenia	3.5	4.1	4.3	(1)
Brazil	3.7	2.2	4.2	(1)
Turkey	4.2	4.8	4.1	(1)
Italy	4.0	4.9	3.8	(1)
Czech Republic	3.5	2.9	2.8	(1)
All other destination markets	15.8	16.3	12.0	(1)
Total Austria exports	100.0	100.0	100.0	(1)

Note.-- IHS/GTA data reported in kilograms and converted into thousands of pounds.

[1] Austria's 2016 export data are not yet available.

Source: Official imports statistics of imports from Austria under HTS subheadings 7202.92 as reported by various countries' statistical authorities in the IHS/GTA database, accessed March 23, 2017.

The industry in Canada

There is a single producer of ferrovanadium in Canada, Masterloy Products Company ("Masterloy Products"), located in Ottawa. Masterloy Products processes customer supplied vanadium pentoxide into 80-grade ferrovanadium as well as customer supplied molybdenum oxide into 70-grade ferromolybdenum.[14] As shown in table VII-9, Canada's exports of ferrovanadium are nearly exclusively to the United States. Vanadium pentoxide, which has a U.S. duty rate of 5.5 percent, can be imported into Canada from the United States duty free, converted there into ferrovanadium that can then be imported into the United States duty-free under NAFTA.

[14] Masterloy, http://www.masterloy.com/products.html , accessed Feb. 20, 2017.

Table VII-9
Ferrovanadium: Exports from Canada by destination market, 2013-16

Destination market	Calendar year			
	2013	2014	2015	2016
	Quantity (1,000 pounds)			
Exports from Canada to the United States	1,404	2,421	1,343	313
Exports from Canada to other major destination markets.--				
South Korea	0	0	0	305
Mexico	0	0	0	149
Norway	0	0	0	0
China	0	0	0	0
Germany	0	0	0	0
Total Canada exports	1,404	2,421	1,343	767
	Value (1,000 dollars)			
Exports from Canada to the United States	13,201	23,905	10,982	2,173
Exports from Canada to other major destination markets.--				
South Korea	0	0	0	2,181
Mexico	0	0	0	1,126
Norway	0	0	0	0
China	0	0	0	0
Germany	3	0	0	0
Total Canada exports	13,204	23,905	10,982	5,481
	Unit value (dollars per pound)			
Exports from Canada to the United States	9.40	9.87	8.18	6.95
Exports from Canada to other major destination markets.--				
South Korea	---	---	---	7.16
Mexico	---	---	---	7.55
Norway	---	---	14.51	---
China	9.98	---	---	---
Germany	16.22	---	---	---
Total Canada exports	9.40	9.87	8.18	7.15
	Share of quantity (percent)			
Exports from Canada to the United States	100.0	100.0	100.0	40.8
Exports from Canada to other major destination markets.--				
South Korea	0.0	0.0	0.0	39.8
Mexico	0.0	0.0	0.0	19.5
Norway	0.0	0.0	0.0	0.0
China	0.0	0.0	0.0	0.0
Germany	0.0	0.0	0.0	0.0
Total Canada exports	100.0	100.0	100.0	100.0

Note.-- IHS/GTA data reported in kilograms and converted into thousands of pounds.

Source: Official Canadian exports statistics under HTS subheading 7202.92 as reported by Statistics Canada in the IHS/GTA database, accessed March 22, 2017.

The industry in the Czech Republic

There is a single producer of ferrovanadium in the Czech Republic, Evraz Nikom, which is a subsidiary of Evraz PLC, the parent company of Evraz Stratcor. Evraz Nikom produces ferrovanadium from vanadium pentoxide produced in Russia by Evraz Vanady Tula, which uses vanadium slag from Evraz' steel-producing subsidiary, Evraz NTMK.[15] Evraz Nikom has an annual capacity of 10 million pounds of ferrovanadium. As shown in Table VII-10, Evraz Nikom exports to several European Union countries, along with Korea, Japan, and the United States.

Table VII-10
Ferrovanadium: Exports from the Czech Republic by destination market, 2013-16

Destination market	Calendar year			
	2013	2014	2015	2016
	Quantity (1,000 pounds)			
Exports from the Czech Republic to the United States	6,393	4,674	2,822	2,240
Exports from the Czech Republic to other major destination markets.--				
Germany	321	1,413	2,651	2,563
Japan	1,334	1,202	1,797	2,260
Netherlands	88	88	750	1,918
Spain	1,003	1,375	1,082	794
Sweden	1,175	1,475	926	686
Italy	82	397	478	569
South Korea	44	0	895	357
Turkey	265	163	353	342
All other destination markets	3,335	2,560	1,875	2,062
Total Exports from the Czech Republic	14,040	13,345	13,629	13,790
	Value (1,000 dollars)			
Exports from the Czech Republic to the United States	52,187	39,996	17,751	10,416
Exports from the Czech Republic to other major destination markets.--				
Germany	3,024	12,991	17,030	12,437
Japan	11,624	10,077	11,125	11,115
Netherlands	730	761	4,937	10,124
Spain	8,585	11,858	7,325	3,919
Sweden	10,609	12,671	5,739	3,422
Italy	741	3,463	3,056	2,843
South Korea	430	0	5,098	1,607
Turkey	2,396	1,336	1,751	1,784
All other destination markets	30,936	21,746	11,750	10,681
Total Exports from the Czech Republic	121,262	114,899	85,561	68,349

Table continues on next page.

[15] Evraz, https://www.evraz.com/products/business/vanadium/nikom/, accessed Feb. 20, 2017.

Table VII-10--Continued
Ferrovanadium: Exports from the Czech Republic by destination market, 2013-16

Destination market	Calendar year			
	2013	2014	2015	2016
	Unit value (dollars per pound)			
Exports from the Czech Republic to the United States	8.16	8.56	6.29	4.65
Exports from the Czech Republic to other major destination markets.--				
Germany	9.43	9.20	6.42	4.85
Japan	8.71	8.39	6.19	4.92
Netherlands	8.28	8.62	6.59	5.28
Spain	8.56	8.63	6.77	4.94
Sweden	9.03	8.59	6.20	4.99
Italy	9.03	8.73	6.39	5.00
South Korea	9.74	---	5.70	4.50
Turkey	9.06	8.19	4.96	5.22
All other destination markets	9.28	8.50	6.27	5.18
Total exports from the Czech Republic	8.64	8.61	6.28	4.96
	Share of quantity (percent)			
Exports from the Czech Republic to the United States	45.5	35.0	20.7	16.2
Exports from the Czech Republic to other major destination markets.--				
Germany	2.3	10.6	19.5	18.6
Japan	9.5	9.0	13.2	16.4
Netherlands	0.6	0.7	5.5	13.9
Spain	7.1	10.3	7.9	5.8
Sweden	8.4	11.1	6.8	5.0
Italy	0.6	3.0	3.5	4.1
South Korea	0.3	0.0	6.6	2.6
Turkey	1.9	1.2	2.6	2.5
All other destination markets	23.8	19.2	13.8	15.0
Total exports from the Czech Republic	100.0	100.0	100.0	100.0

Note.-- IHS/GTA data reported in kilograms and converted into thousands of pounds.

Source: Official Czech Republic exports statistics under HTS subheading 7202.92 as reported by Eurostat in the IHS/GTA database, accessed March 22, 2017.

Global exports

Table VII-11 presents data on global exports by exporter from 2013 to 2016. From 2013 to 2015, total global exports in quantity increased by 5.2 percent, while the value decreased by 22.6 percent. The unit value (in dollars per pound) of total global exports decreased by 26.5 percent during 2013-15.

Table VII-11
Ferrovanadium: Global exports by exporter, 2013-16

Exporter	Calendar year			
	2013	2014	2015	2016
	Quantity (1,000 pounds)			
United States	1,736	1,990	1,612	(1)
Korea	2,899	3,054	6,795	(1)
All other major reporting exporters.--				(1)
Netherlands	13,489	17,528	17,233	
China	13,392	15,578	17,071	(1)
Austria	15,822	17,403	15,934	(1)
Czech Republic	14,040	13,345	13,629	(1)
South Africa	16,908	17,195	12,752	(1)
Russia	3,123	2,282	2,517	(1)
Canada	1,404	2,421	1,343	(1)
Belgium	440	528	852	(1)
Japan	1,632	1,545	692	(1)
Germany	856	1,213	582	(1)
Italy	171	783	419	(1)
All other exporters	2,816	2,815	1,922	(1)
Total global exports	88,729	97,681	93,352	(1)
	Value (1,000 dollars)			
United States	18,198	19,735	12,630	(1)
Korea	26,431	27,314	47,401	(1)
All other major reporting exporters.--				(1)
Netherlands	125,844	112,964	118,523	
China	123,103	136,027	124,311	(1)
Austria	145,419	145,700	106,175	(1)
Czech Republic	121,262	114,899	85,561	(1)
South Africa	170,349	157,146	89,399	(1)
Russia	30,353	20,244	15,600	(1)
Canada	13,204	23,905	10,982	(1)
Belgium	4,653	5,007	6,074	(1)
Japan	10,715	9,544	4,214	(1)
Germany	10,535	12,529	4,450	(1)
Italy	1,583	5,480	2,797	(1)
All other exporters	26,209	29,046	12,423	(1)
Total global exports	827,858	819,541	640,540	(1)

Table continued on next page.

Table VII-11--Continued
Ferrovanadium: Global exports by exporter, 2013-16

Exporter	Calendar year			
	2013	2014	2015	2016
	Unit value (dollars per pound)			
United States	10.48	9.92	7.83	(1)
Korea	9.12	8.94	6.98	(1)
All other major reporting exporters.--				(1)
Netherlands	9.33	6.44	6.88	
China	9.19	8.73	7.28	(1)
Austria	9.19	8.37	6.66	(1)
Czech Republic	8.64	8.61	6.28	(1)
South Africa	10.08	9.14	7.01	(1)
Russia	9.72	8.87	6.20	(1)
Canada	9.40	9.87	8.18	(1)
Belgium	10.59	9.48	7.13	(1)
Japan	6.57	6.18	6.09	(1)
Germany	12.31	10.33	7.65	(1)
Italy	9.25	7.00	6.68	(1)
All other exporters	9.31	10.32	6.46	(1)
Total global exports	9.33	8.39	6.86	(1)
	Share of quantity (percent)			
United States	2.0	2.0	1.7	(1)
Korea	3.3	3.1	7.3	(1)
All other major reporting exporters.--				(1)
Netherlands	15.2	17.9	18.5	
China	15.1	15.9	18.3	(1)
Austria	17.8	17.8	17.1	(1)
Czech Republic	15.8	13.7	14.6	(1)
South Africa	19.1	17.6	13.7	(1)
Russia	3.5	2.3	2.7	(1)
Canada	1.6	2.5	1.4	(1)
Belgium	0.5	0.5	0.9	(1)
Japan	1.8	1.6	0.7	(1)
Germany	1.0	1.2	0.6	(1)
Italy	0.2	0.8	0.4	(1)
All other exporters	3.2	2.9	2.1	(1)
Total global exports	100.0	100.0	100.0	(1)

Note. -- IHS/GTA data reported in kilograms and converted into thousands of pounds.

[1] Global exports' 2016 data are not yet available.

Source: Official exports statistics under HTS subheading 7202.92 as reported by various national statistical authorities in the GTIS/GTA database, accessed January 19, 2017.

APPENDIX A

FEDERAL REGISTER NOTICES

The Commission makes available notices relevant to its investigations and reviews on its website, www.usitc.gov. In addition, the following tabulation presents, in chronological order, *Federal Register* notices issued by the Commission and Commerce during the current proceeding.

Citation	Title	Link
81 FR 18888 April 1, 2016	*Commission's Institution of Antidumping Duty Investigation and Scheduling of Preliminary Phase Investigation*	https://www.gpo.gov/fdsys/pkg/FR-2016-04-01/pdf/2016-07416.pdf
81 FR 24059 April 25, 2016	*Commerce's Initiation of Less-Than-Fair-Value Investigation*	https://www.gpo.gov/fdsys/pkg/FR-2016-04-25/pdf/2016-09537.pdf
81 FR 31254 May 18, 2016	*Commission's Preliminary Determination and Commencement of Final Phase Investigation*	https://www.gpo.gov/fdsys/pkg/FR-2016-05-18/pdf/2016-11668.pdf
81 FR 75806 November 1, 2016	*Commerce's Affirmative Preliminary Determination of Sales at LTFV and Postponement of Final Determination and Extension of Provisional Measures*	https://www.gpo.gov/fdsys/pkg/FR-2016-11-01/pdf/2016-26363.pdf
81 FR 87590 December 5, 2016	*Commission's Scheduling of the Final Phase of an Antidumping Duty Investigation*	https://www.gpo.gov/fdsys/pkg/FR-2016-12-05/pdf/2016-29034.pdf
82 FR 14874 March 23, 2017	*Commerce's Final Determination of Sales at LTFV*	https://www.gpo.gov/fdsys/pkg/FR-2017-03-23/pdf/2017-05808.pdf

APPENDIX B

LIST OF HEARING WITNESSES

CALENDAR OF PUBLIC HEARING

Those listed below appeared as witnesses at the United States International Trade Commission's hearing:

Subject: Ferrovanadium from Korea

Inv. No.: 731-TA-1315 (Final)

Date and Time: March 21, 2017 - 9:30 a.m.

A Session was held in connection with this investigation in the Main Hearing Room (room 101), 500 E Street, S.W., Washington, DC.

OPENING REMARKS:

Petitioners (**John B. Totaro, Jr.**, Neville Peterson, LLP)

In Support to the Imposition of Antidumping Duty Order:

Neville Peterson, LLP
Washington, DC
on behalf of

Vanadium Producers and Reclaimers Association ("VPRA")
AMG Vanadium LLC ("AMG V")
Bear Metallurgical Company ("Bear")
Gulf Chemical & Metallurgical Corporation ("Gulf")
Evraz Stractor, Inc. ("Stratcor")

Mark Anderson, Vice President of Global Marketing and Sales, AMG V

David F. Carey, General Manager, Bear

Jennifer Lutz, Senior Economist, Economic Consulting Services, LLC

John B. Totaro, Jr.) – OF COUNSEL

CLOSING REMARKS:

Petitioners (**John B. Totaro, Jr.**, Neville Peterson, LLP)

-END-

APPENDIX C

SUMMARY DATA

Table C-1
Ferrovanadium: Summary data concerning the U.S. market, 2013-15, January to September 2015, and January to September 2016
(Quantity=1,000 pounds contained vanadium; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per pound contained vanadium; Period changes=percent--exceptions noted)

	Reported data					Period changes			
	Calendar year			January to September		Calendar year			Jan-Sep
	2013	2014	2015	2015	2016	2013-15	2013-14	2014-15	2015-16
U.S. consumption quantity:									
Amount	***	***	***	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***	***	***	***
Importers' share (fn1):									
Korea	***	***	***	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***	***	***	***
All import sources	***	***	***	***	***	***	***	***	***
U.S. consumption value:									
Amount	***	***	***	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***	***	***	***
Importers' share (fn1):									
Korea	***	***	***	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***	***	***	***
All import sources	***	***	***	***	***	***	***	***	***
U.S. imports from:									
Korea:									
Quantity	784	1,243	1,612	1,156	532	105.5	58.5	29.6	(54.0)
Value	9,599	14,715	15,636	12,005	3,806	62.9	53.3	6.3	(68.3)
Unit value	$12.24	$11.84	$9.70	$10.38	$7.15	(20.7)	(3.3)	(18.0)	(31.1)
Ending inventory quantity	***	***	***	***	***	***	***	***	***
Nonsubject sources:									
Quantity	7,400	***	***	***	***	***	***	***	***
Value	83,939	83,210	50,732	44,459	33,398	(39.6)	(0.9)	(39.0)	(24.9)
Unit value	$11.34	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
All import sources:									
Quantity	8,184	***	***	***	***	***	***	***	***
Value	93,538	97,925	66,367	56,465	37,204	(29.0)	4.7	(32.2)	(34.1)
Unit value	$11.43	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
U.S. producers':									
Average capacity quantity	***	***	***	***	***	***	***	***	***
Production quantity	***	***	***	***	***	***	***	***	***
Capacity utilization (fn1)	***	***	***	***	***	***	***	***	***
U.S. shipments:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Export shipments:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
Inventories/total shipments (fn1)	***	***	***	***	***	***	***	***	***
Production workers	***	***	***	***	***	***	***	***	***
Hours worked (1,000s)	***	***	***	***	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***	***	***	***	***
Hourly wages (dollars)	***	***	***	***	***	***	***	***	***
Productivity (pounds contained vanadium per hour)	***	***	***	***	***	***	***	***	***
Unit labor costs	***	***	***	***	***	***	***	***	***
Net sales:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Cost of goods sold (COGS)	***	***	***	***	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***	***	***	***	***
SG&A expenses	***	***	***	***	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***	***	***	***	***
Net income or (loss)	***	***	***	***	***	***	***	***	***
Capital expenditures	***	***	***	***	***	***	***	***	***
Unit COGS	***	***	***	***	***	***	***	***	***
Unit SG&A expenses	***	***	***	***	***	***	***	***	***
Unit operating income or (loss)	***	***	***	***	***	***	***	***	***
Unit net income or (loss)	***	***	***	***	***	***	***	***	***
COGS/sales (fn1)	***	***	***	***	***	***	***	***	***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	***	***	***	***
Net income or (loss)/sales (fn1)	***	***	***	***	***	***	***	***	***

Notes:

fn1.--Reported data are in percent and period changes are in percentage points.
fn2.--Undefined.

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. import statistics, using statistical reporting number 7202.92.0000, accessed December 1, 2016, and adjusted to include suppressed quantity data for U.S. imports from ***, using proprietary Customs records.

APPENDIX D

NONSUBJECT COUNTRY PRICE DATA

Five importers reported price data for Austria, three for Canada, and two for the Czech Republic. Price data reported by these firms accounted for 24.5 percent of U.S. commercial shipments from Austria, 10.7 percent of U.S. commercial shipments from Canada, and 46.5 percent of U.S. commercial shipments from the Czech Republic. These price items and accompanying data are comparable to those presented in tables V-3 and V-4 and figures V-3 and V-4. Price and quantity data for Austria, Canada, and the Czech Republic are shown in tables D-1 and D-2 and figures D-1 and D-2 (with domestic and subject sources).

In comparing nonsubject country pricing data with U.S. producer pricing data, prices for product imported from Austria, Canada, and the Czech Republic were lower than prices for U.S.-produced product in 24 instances and higher in 36 instances. In comparing nonsubject country pricing data with Korean pricing data, prices for product imported from Austria, Canada, and Czech Republic were lower than prices for product imported from Korea in 9 instances and higher in 33 instances. A summary of price differentials is presented in table D-3.[1]

Table D-1

Ferrovanadium: Weighted-average f.o.b. prices and quantities of imported product 1, by quarter, January 2013-September 2016

* * * * * * *

Table D-2

Ferrovanadium: Weighted-average f.o.b. prices and quantities of imported product 2, by quarter, January 2013-September 2016

* * * * * * *

Figure D-1

Ferrovanadium: Weighted-average f.o.b. prices and quantities of domestic and imported product 1, by quarter, January 2013-September 2016

* * * * * * *

Figure D-2

Ferrovanadium: Weighted-average f.o.b. prices and quantities of domestic and imported product 2, by quarter, January 2013-September 2016

* * * * * * *

[1] ***.

Table D-3

Ferrovanadium: Summary of underselling/(overselling), by country, January 2013-September 2016

Comparison	Total number of comparisons	Nonsubject lower than the comparison source		Nonsubject higher than the comparison source	
		Number of quarters	Quantity (pounds contained vanadium)	Number of quarters	Quantity (pounds contained vanadium)
Nonsubject vs United States:					
Austria vs. United States	30	10	***	20	***
Canada vs. United States	15	3	***	12	***
Czech Republic vs. United States	15	11	***	4	***
Nonsubject vs subject countries:					
Austria vs. Korea	14	2	***	12	***
Canada vs. Korea	14	2	***	12	***
Czech Republic vs. Korea	14	5	***	9	***

Source: Compiled from data submitted in response to Commission questionnaires.