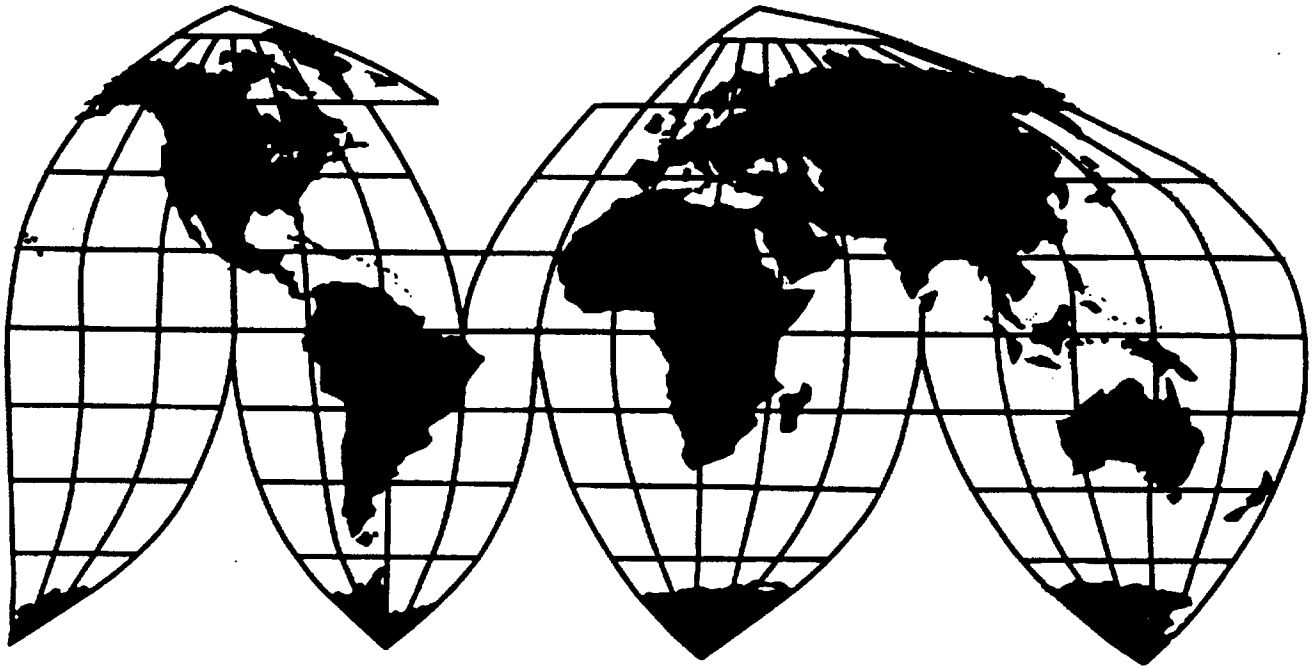
DRAMs and DRAM Modules From Korea

Investigation No. 701-TA-431 (Final)

Publication 3616 **August 2003**

U.S. International Trade Commission



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Note.–Information that would reveal confidential operations of individual concerns may not be published and therefore has been deleted from this report. Such deletions are indicated by asterisks.

UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 701-TA-431 (Final)

DRAMS AND DRAM MODULES FROM KOREA

DETERMINATION

On the basis of the record[1] developed in the subject investigation, the United States International Trade Commission (Commission) determines,[2] pursuant to section 705(b) of the Tariff Act of 1930 (19 U.S.C. § 1671d(b)) (the Act), that an industry in the United States is materially injured by reason of imports from Korea of dynamic random access memory semiconductors (DRAMs) and DRAM modules, provided for in subheadings 8473.30.10 and 8542.21.80 of the Harmonized Tariff Schedule of the United States, that have been found by the Department of Commerce (Commerce) to be subsidized by the Government of Korea.

BACKGROUND

The Commission instituted this investigation effective November 1, 2002, following receipt of a petition filed with the Commission and Commerce by Micron Technology, Inc., Boise, ID. The final phase of the investigation was scheduled by the Commission following notification of a preliminary determination by Commerce that imports of DRAMs and DRAM modules from Korea were being subsidized within the meaning of section 703(b) of the Act (19 U.S.C. § 1671b(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* of April 16, 2003 (68 F.R. 18671). The hearing was held in Washington, DC, on June 24, 2003, and all persons who requested the opportunity were permitted to appear in person or by counsel.

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

[2] Commissioner Marcia E. Miller did not participate in this investigation.

VIEWS OF THE COMMISSION

Based on the record in this investigation, we determine that an industry in the United States is materially injured by reason of imports of dynamic random access memory semiconductors ("DRAMs") and DRAM modules from the Republic of Korea ("Korea") sold in the United States that the U.S. Department of Commerce ("Commerce") has found to be subsidized by the Government of Korea.[1]

I. 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 the subject merchandise, the Commission first defines the "domestic like product" and the "industry."[2] Section 771(4)(A) of the Tariff Act of 1930, as amended ("the Act"), defines the relevant domestic industry as the "producers as a [w]hole 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."[3] In turn, the 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 . . . ."[4]

The decision regarding the appropriate domestic like product(s) 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.[5] No single factor is dispositive, and the Commission may consider other factors it deems relevant based on the facts of a particular investigation.[6] The Commission looks for clear dividing lines among possible like products and disregards minor variations.[7] Although the Commission must accept Commerce's determination as to the scope of the subsidized

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[1] Commissioner Miller did not participate in this investigation. See Mem. CO72-Z-006 (Dec. 6, 2002).

[2] 19 U.S.C. § 1677(4)(A).

[3] Id.

[4] 19 U.S.C. § 1677(10).

[5] See, e.g., 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: (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, e.g., Nippon, 19 CIT at 455 n.4; Timken Co. v. United States, 913 F. Supp. 580, 584 (Ct. Int'l Trade 1996). In a semi-finished product analysis, the Commission examines: (1) whether the upstream article is dedicated to the production of the downstream article or has independent uses; (2) whether there are perceived to be separate markets for the upstream and downstream articles; (3) differences in the physical characteristics and functions of the upstream and downstream articles; (4) differences in the costs or value of the vertically differentiated articles; and (5) significance and extent of the processes used to transform the upstream into the downstream articles. See, e.g., Uranium from Kazakhstan, Inv. No. 731-TA-539-A (Final), USITC Pub. 3213 at 6, n.23 (July 1999).

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

[7] See, e.g., Nippon Steel, 19 CIT at 455; Torrington, 747 F. Supp. at 748-49; see also S. Rep. No. 96-249, at 90-91 (1979) (Congress has indicated that the domestic 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.").

subject merchandise, the Commission determines what domestic product is like the imported articles Commerce has identified.[8]

B. Product Description

Commerce's final determination defines the imported merchandise within the scope of this investigation as –

> dynamic random access memory semiconductors ("DRAMs") from the Republic of Korea ("ROK"), whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut die, and cut die. Processed wafers fabricated in the ROK, but assembled into finished semiconductors outside the ROK are also included in the scope. Processed wafers fabricated outside the ROK and assembled into finished semiconductors in the ROK are not included in the scope.
>
> The scope of this investigation additionally includes memory modules containing DRAMs from the ROK. A memory module is a collection of DRAMs, the sole function of which is memory. Memory modules include single in-line processing modules, single in-line memory modules, dual in-line memory modules, small outline dual in-line memory modules, Rambus in-line memory modules, and memory cards or other collections of DRAMs, whether unmounted or mounted on a circuit board. Modules that contain other parts that are needed to support the function of memory are covered. Only those modules that contain additional items which alter the function of the module to something other than memory, such as video graphics adapter boards and cards, are not included in the scope. This investigation also covers future DRAMs module types.
>
> The scope of this investigation additionally includes, but is not limited to, video random access memory and synchronous graphics random access memory, as well as various types of DRAMs, including fast page-mode, extended data-out, burst extended data-out, synchronous dynamic RAM, Rambus DRAM and Double Data Rate DRAM. The scope also includes any future density, packaging, or assembling of DRAMs. Also included in the scope of this investigation are removable memory modules placed on motherboards, with or without a central processing unit, unless the importer of the motherboards certifies with the U.S. Bureau of Customs and Border Protection ("Customs") that neither it, nor a party related to it or under contract to it, will remove the modules from the motherboards after importation. The scope of this investigation does not include DRAMs or memory modules that are re-imported for repair or replacement.[9]

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[8] See, e.g., Hosiden Corp. v. Advanced Display Mfrs., 85 F.3d 1561, 1568 (Fed. Cir. 1996) (Commission may find single domestic like product corresponding to several different classes or kinds defined by Commerce); Torrington, 747 F. Supp. at 748-52 (affirming Commission's determination of six domestic like products in investigations where Commerce found five classes or kinds).

[9] 68 Fed. Reg. 37122, 37123 (June 23, 2003). Commerce noted that the DRAMs subject to this investigation are currently classifiable under subheadings 8542.21.8005 and 8542.21.8021 through 8542.21.8029 of the Harmonized Tariff Schedule of the United States ("HTSUS"). The memory modules containing DRAMs from Korea are currently classifiable under subheadings 8473.30.1040 or 8473.30.1080 of the HTSUS. It also noted that although the HTSUS subheadings are provided for convenience and Customs purposes, Commerce's written description of the

Such products are hereinafter referred to as DRAMs, DRAM modules, or collectively DRAM products.

C. Domestic Like Product

In previous investigations of DRAM products, the Commission defined the domestic like product as all DRAM products.[10] More specifically, the Commission concluded, based on its semifinished domestic like product analysis, that the domestic like product included cased and uncased DRAMs as well as DRAMs packaged into memory modules. The Commission also concluded, based on its traditional domestic like product analysis, that the domestic like product also included all DRAM products regardless of density as well as specialty DRAM products. In the preliminary phase of this investigation, petitioner Micron Technology Inc. ("Micron") argued that the Commission should define the domestic like product as all DRAM products, including both assembled and unassembled DRAMs, memory modules, all DRAM product applications or types, and all densities of DRAM products,[11] and Hynix and Samsung agreed.[12] In light of the parties' agreement regarding the definition of the domestic like product, the Commission found a single domestic like product consisting of all DRAM products regardless of density, including cased and uncased DRAMs as well as DRAMs packaged into memory modules, and including all DRAM product types.[13]

In the final phase of this investigation, no party argued that the Commission should revisit its domestic like product finding in this case,[14] nor have any facts arisen in the investigation that would otherwise indicate that the Commission should do so. Accordingly, we again find a single domestic like product consisting of all DRAM products regardless of density, including cased and uncased DRAMs as well as DRAMs packaged into memory modules, and including all DRAM product types.

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scope of this investigation remains dispositive. See id.

[10] See, e.g., Dynamic Random Access Memory Semiconductors of One Megabit and Above from Taiwan, Inv. No. 731-TA-811 (Final), USITC Pub. 3256 at 6 (Dec. 1999) ("Taiwan Final"); Dynamic Random Access Memory Semiconductors of One Megabit and Above from Taiwan, Inv. No. 731-TA-811 (Prelim.), USITC Pub. 3149 at 5-7 (Dec. 1998) ("Taiwan Prelim."); DRAMs of One Megabit and Above from the Republic of Korea, Inv. No. 731-TA-556 (Final) (Remand), USITC Pub. 2997 at 2-3 (Oct. 1996) ("Korean I Remand"); DRAMs of One Megabit and Above from the Republic of Korea, Inv. No. 731-TA-556 (Final), USITC Pub. 2629 at 6-12 (May 1993) ("Korean I Final"); DRAMs of One Megabit and Above from the Republic of Korea, Inv. No. 731-TA-556 (Prelim.), USITC Pub. 2519 at 3-10 (June 1992); 64K Dynamic Random Access Memory Components from Japan, Inv. No. 731-TA-270 (Final), USITC Pub. 1862 at 3-11 (June 1986) ("Japan 64K Final"); Dynamic Random Access Memory Semiconductors of 256 Kilobits and Above from Japan, Inv. No. 731-TA-300 (Prelim.), USITC Pub. 1803 at 3-13 (Jan. 1986) ("Japan 256K Prelim."); 64K Dynamic Random Access Memory Components from Japan, Inv. No. 731-TA-270 (Prelim.), USITC Pub. 1735 at 3-4 (Aug. 1985) ("Japan 64K Prelim."). These findings also are consistent with the Commission's definition of the domestic like product in Static Random Access Memory Semiconductors from the Republic of Korea and Taiwan, Invs. Nos. 731-TA-761 to 762 (Final), USITC Pub. 3098 at 5-8 (Apr. 1998) ("Korea/Taiwan SRAMs Final").

[11] See, e.g., Micron's Postconference Brief at 2-5; Conference Tr. at 33-34 (Esch).

[12] See, e.g., Postconference Brief of Hynix and Samsung (hereinafter "Respondents' Postconference Brief") at 7, Exh. 1; Conference Tr. at 72 (Bishop). The term "Hynix" refers herein to the collective companies of Hynix Semiconductor Manufacturing America, Hynix Semiconductor America, and Hynix Semiconductor Inc., and the term "Samsung" refers herein to the collective companies of Samsung Austin Semiconductor, LLC, Samsung Semiconductor, Inc., and Samsung Electronics America, Inc.

[13] See DRAMs and DRAM Modules from Korea, Inv. No. 701-TA-431 (Prelim.), USITC Pub. 3569 at 5-6 (Dec. 2002) ("Preliminary Determination").

[14] See, e.g., Hynix's Prehearing Brief at 7; Infineon's Prehearing Brief at 1; Micron's Prehearing Brief at 6-10.

II. DOMESTIC INDUSTRY AND RELATED PARTIES

The domestic industry is defined as "the producers as a [w]hole of a domestic like product whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[15] In defining the domestic industry, the Commission's general practice has been to include in the industry all domestic production of the domestic like product, whether toll-produced, captively consumed, or sold in the domestic merchant market.[16]

Based on the current record, during at least part of the period of investigation eight firms performed wafer fabrication in the United States, five firms performed DRAM casing ("assembly"), and two of those firms which performed both fabrication and assembly also stuffed ("packaged") DRAMs into DRAM modules domestically.[17] During at least some part of the period of investigation, Micron, Infineon, Hynix, Samsung, Dominion Semiconductor,[18] Fujitsu,[19] IBM,[20] and NECELAM[21] fabricated uncased DRAMs.[22] Hynix and Samsung export all of their U.S.-fabricated wafers to Korea for final assembly into DRAMs.[23] During the period of investigation, Micron, Infineon, NECELAM, and IBM had operations to assemble DRAMs in the United States.[24] In addition, Kingston Technology Co., Inc. ("Kingston"), a domestic module packager, has a *** Payton Technology Corp. ("Payton") that assembles DRAMs in the United States.[25] The record also indicates that *** imported uncased DRAMs fabbed in third countries and assembled them in the United States for sale as DRAMs or DRAM modules.[26] There are also some DRAMs and DRAM modules sold in the United States that are from DRAMs fabbed in the United States, but assembled in third countries.[27] Finally, the record suggests that some companies, including PNY, Simple Technologies, and Smart Modular package DRAMs into DRAM modules, but these companies neither fabricate wafers nor assemble DRAMs.[28]

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[15] 19 U.S.C. § 1677(4)(A).

[16] See, e.g., United States Steel Group v. United States, 873 F. Supp. 673, 681-84 (Ct. Int'l Trade 1994), aff'd, 96 F.3d 1352 (Fed. Cir. 1996).

[17] A third firm, Kingston, assembled DRAM modules in the United States, ***. See, e.g., Confidential Staff Report, Mem. INV-AA-093 (July 10, 2003), as amended by Mem. INV-AA-096 (July 14, 2003) and Mem. INV-AA-099 (July 16, 2003), ("CR") at III-7; Public Report ("PR") at III-4.

[18] Dominion Semiconductor was a DRAM joint venture between Toshiba Corp. of Japan and International Business Machines ("IBM") of New York. IBM sold its stake in the venture in 2000, and in early 2002, Toshiba sold the entire facility to Micron. See, e.g., CR at III-3 to III-4; PR at III-2 to III-3.

[19] Fujitsu closed its DRAM facility in 2001. See, e.g., CR/PR at Table III-1 at n.4.

[20] IBM ceased all U.S.-DRAMs fabrication in 2000, and completely exited the DRAM production business by mid-2001. See, e.g., CR/PR at Table III-1 at n.5.

[21] NEC Electronics America ("NECELAM") ceased DRAM production in 2001. See, e.g., CR/PR at Table III-1 at n.8.

[22] See, e.g., CR/PR at Table III-1.

[23] See, e.g., CR at III-5, III-8; PR at III-3, III-5.

[24] See, e.g., CR/PR at Table III-1.

[25] See, e.g., CR at III-1 at n.1, III-6 to III-7; PR at III-1 at n.1, III-4.

[26] (Derived from questionnaire responses).

[27] For example, Micron reports that it has a large DRAM assembly facility in Singapore that utilizes dice fabricated in Italy, Japan, and the United States, in addition to the dice fabricated in Singapore. It also believes that U.S. dice fabricated by producers other than Micron are assembled in third countries and imported for sale in the U.S. market from Canada and Mexico. Micron reports that the countries with known DRAM fabrication facilities currently in operation are the United States, Korea, Taiwan, Japan, Singapore, China, Italy, and Germany. It reports that countries that do not fabricate DRAMs but have significant DRAM assembly facilities include Portugal, Malaysia, and Canada. See, e.g., Petition at 131-32. ***.

[28] See, e.g., Petition at 5 & n.6.

A. What Constitutes Sufficient Production-Related Activities

1. Fabbers, Module Packagers, and Fabless Design Houses

In previous investigations and in its preliminary determination in this investigation, the Commission concluded that the domestic industry producing DRAM products consists of those producers that fabricate DRAMs in the United States, and those producers that assemble DRAMs in the United States, but that the industry does not include module "packagers" or fabless design houses.[29] With respect to each of those operations, the Commission identified the relevant inquiry as whether the operations in question constituted sufficient production-related activities in the United States. In assessing the nature and extent of production-related activities in the United States associated with a particular operation, the Commission generally considers six factors:

(1) source and extent of the firm's capital investment;
(2) technical expertise involved in U.S. production activities;
(3) value added to the product in the United States;
(4) employment levels;
(5) quantity and type of parts sourced in the United States; and
(6) any other costs and activities in the United States directly leading to production of the like product.[30]

No single factor is determinative and the Commission may consider any other factors it deems relevant in light of the specific facts of any investigation.[31] All of the parties agree with the Commission's findings in the preliminary phase of this investigation that fabrication of uncased DRAMs constitutes sufficient production-related activities to qualify as domestic production and that companies that only package DRAMs into DRAM modules and fabless design houses do not engage in sufficient production-related activities.[32] In light of the parties' agreement and the absence of factual information on the record in the final phase of this investigation contradicting the Commission's analysis in the preliminary determination or in previous investigations, we again find that fabrication of uncased DRAMs in the United States constitutes sufficient production-related activities to include producers that fabricate uncased DRAMs in the domestic industry. For the same reasons, we also find that companies that only package DRAMs into DRAM modules and fabless design houses do not engage in sufficient production-related activities to warrant their inclusion in the domestic industry.

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[29] See, e.g., Preliminary Determination, USITC Pub. 3569 at 6-11; Taiwan Final, USITC Pub. 3256 at 6-12; Korea/Taiwan SRAMs Final, USITC Pub. 3098 at 8-10; Korean I Final, USITC Pub. 2629 at 12-16; Japan 64K Final, USITC Pub. 1862 at 11-12.

[30] See, e.g., Greenhouse Tomatoes from Canada, Inv. No. 731-TA-925 (Final), USITC Pub. 3499 at 10-11 (Apr. 2002).

[31] See, e.g., Aramid Fiber Formed of Poly Para-Phenylene Terephthalamide from the Netherlands, Inv. No. 731-TA-652 (Final), USITC Pub. 2783 at I-8 to I-9 & n.34 (June 1994) ("no single factor – including value added – is determinative and ... value added information becomes more meaningful when other production activity indicia are taken into account").

[32] See, e.g., Micron's Prehearing Brief at 11-14; Infineon's Prehearing Brief at 1-4; Hynix's Prehearing Brief at 7-9, Exh. 1.

2. DRAM Assembly Operations

a. Parties' Arguments

Hynix argues that DRAMs and DRAM modules containing DRAMs that are fabbed in the United States and assembled in the United States should be considered domestic production, but that DRAMs and DRAM modules containing DRAMs that are fabbed in third countries and assembled in the United States should be considered non-subject imports. Hynix does not dispute that assembly operations comprise sufficient production-related activities to constitute domestic production if the product being assembled was fabbed in the United States. Hynix, however, argues that the Commission's approach of treating fabrication as determinative of country of origin in all cases except where DRAMs and DRAM modules contain DRAMs that are fabbed in third countries and assembled in the United States is internally inconsistent. It also alleges that this approach masks the role of non-subject imports on the condition of the domestic industry, and is inconsistent with U.S. proposals in WTO negotiations on non-preferential rules of origin, and with the practices of Commerce, the European Union, Japan, and Korea. Hynix argues that it is legally possible both to recognize that assembly is a legitimate U.S. production-related activity and that fabrication controls country-of-origin for shipments (market share) and pricing purposes.[33] Hynix states that its research has not yielded any case in which the Commission was faced with the same situation.[34]

Micron and Infineon argue that shipments of DRAMs and DRAM modules containing DRAMs that were either fabbed in the United States or assembled in the United States from dice fabbed anywhere but by Hynix in Korea should be treated as domestic shipments, consistent with the Commission's practice in other investigations. They argue that both fabbing and assembly operations are significant production-related activities, such that if either or both operations are performed in the United States, shipments of the resulting DRAMs or modules containing those DRAMs should be considered domestic shipments. Although there may be some inconsistency to the Commission's approach, they argue that the results are correct based on application of the usual test and the statutory purpose of the Commission's inquiry – to identify domestic production operations of a like product and to analyze the impact of unfairly traded imports on such operations.[35]

b. Analysis and Finding

For Customs' purposes, the country of origin of DRAMs is considered to be the country where the DRAMs were assembled because Customs has determined that assembly operations constitute a substantial transformation of the merchandise.[36] For purposes of determining the scope of subject

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[33] It argues that there is no reason why different data cannot be utilized for different purposes. Thus, it argues that it is entirely appropriate to include the wages, number of employees, production expenses, and profitability of the assembly operations in assessing the condition of the domestic industry, but at the same time designate the sale of a DRAM product (which is fabbed in a third country and assembled in the United States) as the sale of a non-subject product. Utilizing this approach, it argues, the Commission can recognize that the assembly activity is a legitimate part of the DRAM producing industry, but also can utilize a consistent approach for designating the appropriate country-of-origin of DRAM products.

[34] See, e.g., Hynix's Prehearing Brief at 7-9, Exh. 1; Hynix's Posthearing Brief at Exh. 1 at 60-62; Respondents' Postconference Brief at 8, Exh. 1; Conference Tr. at 72-77 (Porter, Bishop), 114-15 (Porter).

[35] See, e.g., Infineon's Prehearing Brief at 1-4; Infineon's Posthearing Brief at Exh. 1 at 23; Micron's Prehearing Brief at 11-14; Micron's Posthearing Brief at Exh. 3 at 16-18; Exh. 4 at 1; Micron's Postconference Brief at 5-10; Hearing Tr. at 128-29 (Esch).

[36] See, e.g., CR at I-6; PR at I-5.

merchandise in this investigation (as well as in other investigations of DRAM and SRAM products), Commerce determined the country of origin of DRAMs and DRAM modules based on the country where the DRAMs were fabbed.[37] For the Commission's purposes, the statute requires that a company be a producer of a domestic like product to be included in the domestic industry.[38] There is no dispute that uncased DRAMs as well as cased DRAMs are part of the domestic like product, as indicated above. Although assembly operations are not as sophisticated a process as fabrication, we again find that both operations involve sufficient production-related activities to constitute domestic production.

Source and Extent of Capital Investment. The cost of a new fabrication facility (and equipment) is estimated to be more than $2 billion, whereas the cost of a new assembly facility is estimated to be approximately $300 million.[39] Both fabbing operations and assembly operations warrant continuing research and development and capital spending to keep up with the latest product and process developments.[40]

Technical Expertise involved in U.S. Production Activities. The fabrication process is highly automated,[41] takes two to three months to complete, is the stage where the electrical and technical characteristics of the individual dice are developed, and is the process on which Commerce bases its country of origin determinations in Title VII investigations.[42] Assembly operations are somewhat more

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[37] See, e.g., CR at I-6; PR at I-5; 68 Fed. Reg. 37122, 37123 (June 23, 2003).

[38] See 19 U.S.C. § 1677(4)(A).

[39] See, e.g., CR at I-11 to I-12 & n.27; PR at I-8 to I-9 & n.27.

[40] According to questionnaire responses of ***, during the period of investigation, *** capital expenditures for uncased DRAMs accounted for *** percent of its total capital expenditures between 2000 and 2002, and were *** percent of its total capital expenditures in interim 2003 compared to *** percent in interim 2002. *** capital expenditures for cased DRAMs were reported to be *** percent of total capital expenditures between 2000 and 2002, and *** percent in interim 2003 compared to *** percent in interim 2002. *** capital expenditures for uncased DRAMs accounted for *** to *** percent of its total capital expenditures between 2000 and 2002, and were *** percent of its total capital expenditures in interim 2003 compared to *** percent in interim 2002. *** capital expenditures for cased DRAMs were reported to be *** percent of total capital expenditures between 2000 and 2002, and *** percent in interim 2003 compared to *** percent in interim 2002. *** research and development expenditures for uncased DRAMs accounted for *** percent of its total research and development expenditures between 2000 and 2002, and were *** percent of its total *** expenditures in interim 2003 compared to *** percent in interim 2002. *** research and development expenditures for cased DRAMs were reported to be about *** percent of total research and development expenditures throughout the period of investigation. *** research and development expenditures for uncased DRAMs accounted for *** percent of its total research and development expenditures between 2000 and 2002, and were *** percent of its total research and development expenditures in interim 2003 compared to *** percent in interim 2002. *** research and development expenditures for cased DRAMs were reported to be *** percent of total research and development expenditures between 2000 and 2002, and *** percent in interim 2003 compared to *** percent in interim 2002.

[41] DRAMs are produced on wafers of highly purified silicon, with 8 inches being the standard diameter. The process of fabricating DRAMs (or "dice" or "chips") on a silicon wafer entails the use of photomasks and photolithographic and etching equipment to "expose" circuit patterns onto the surface of the wafer. Chemical impurities are introduced to form conducting and non-conducting regions on the wafer by changing the electrical characteristics of certain areas. The wafers are cleaned, deposition equipment is used to build up additional surface layers, and the process begins again. A completed DRAM chip typically will have multiple layers. Metal connections between selected regions of each die are formed and a final protective coating is applied to the wafer. At the close of the fabrication stage, a wafer-probe test is performed, electrically testing each die on the wafer and marking defective dice for rejection. See, e.g., CR at I-11; PR at I-8 to I-9.

[42] See, e.g., CR at I-11; PR at I-8 to I-9.

labor intensive than fabrication,[43] but are nevertheless a highly automated and technologically sophisticated process that takes an estimated seven to fourteen days; Customs uses assembly operations as the basis for country of origin determinations for DRAMs. Whereas a fabrication plant requires a Class 1 clean room and involves more than 100 different material inputs and 180 operations, respondents report that a DRAM assembly plant only requires a Class 1,000 clean room, 10 material inputs, and 10 operations.[44]

Value Added to the Product in the United States. While fabrication involves greater value added than assembly operations, total value added by the assembly process is more than minimal in absolute terms, and particularly over the life of DRAM products. A Micron representative testified at the staff conference that at the beginning of a product's life cycle, 80 to 90 percent of the cost of production is accounted for by fabrication, but that ultimately, fabrication declines to account for only 30 to 40 percent.[45] According to questionnaire responses submitted by ***.[46]

Employment Levels. Assembly operations employ a significant number of domestic production and related workers ("PRWs"). In 2002, the number of PRWs involved in assembly was *** compared to 10,998 PRWs engaged in fabrication operations.[47]

Quantity and Type of Parts Sourced in the United States. Assembly operations source domestically *** of uncased DRAMs used.[48]

Because the record in the final phase of this investigation continues to demonstrate that DRAM assembly operations, although not as sophisticated as fabrication operations, involve a moderate degree of technological sophistication, require continuing research and development and capital spending to keep up with the latest product and process developments, involve more than minimal value added particularly over the life of DRAM products, employ a significant number of domestic PRWs, and source domestically the *** of uncased DRAMs used, we again find that assembly operations involve sufficient production-related activity to constitute domestic production.[49]

Hynix argues that shipments of DRAM products that were fabricated in third countries but assembled in the United States should be considered non-subject imports. In effect, what respondents request is for the Commission to give determinative weight to the "quantity and type of parts sourced in the United States" factor on a transaction-by-transaction basis. According to the record in the final phase of this investigation, such shipments ***. The estimated volume of such domestic shipments of DRAM products made from DRAMs fabricated in third countries (including Samsung Korean-fabricated dice)

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[43] The assembly operations involve back grinding the wafer to the desired thickness, separating the wafer into individual chips, curing the chips by exposing them to ultraviolet light, wire bonding metal lead frames to the chips, solder plating the metal leads, trimming and forming the leads into a desired shape, and encapsulating the chips (usually in plastic). After assembly, chips are given final tests to ensure quality and reliability and are marked for identification purposes. See, e.g., CR at I-12; PR at I-9.

[44] See, e.g., CR at I-12; PR at I-9; Petition at 6, Exh. 6; Respondents' Nov. 22, 2002, PowerPoint submission.

[45] See, e.g., Conference Tr. at 59-60 (Appleton).

[46] See, e.g., CR at I-12 at n.27; PR at I-9 n.27. ***.

[47] See, e.g., CR/PR at Table III-8.

[48] Based on domestic production data reported in questionnaires in billions of bits, U.S.-cased DRAM products incorporating U.S.-fabricated DRAMs were *** in 2000; *** in 2001; and *** in 2002, while U.S.-cased DRAM products incorporating third-country fabricated DRAMs were *** in 2000; *** in 2001; and *** in 2002. *** of the domestically cased DRAM products incorporated Korean-fabricated DRAMs during the period of investigation. (Figures were derived from questionnaire responses).

[49] See, e.g., Preliminary Determination, USITC Pub. 3569; Taiwan Final, USITC Pub. 3256; Korea/Taiwan SRAMs Final, USITC Pub. 3098; Korean I Final, USITC Pub. 2629; Japan 64K Final, USITC Pub. 1862.

but assembled in the United States rose in billions of bits from *** in 2000 to *** in 2001 and increased further to *** in 2002 and was *** in interim 2003 compared to *** in interim 2002.[50]

The Commission has never given determinative weight to an individual factor in previous investigations, including previous investigations of DRAM and SRAM products, nor has it examined any individual factor on a company-specific basis, let alone on a transaction-specific basis for each company. For example, in the Taiwan DRAMs investigation, the Commission found DRAM assembly operations to constitute domestic production, "regardless of whether the producer is integrated and regardless of the origin (domestic or imported non-subject) of the uncased DRAMs assembled in the United States."[51] In that case, Commerce's scope defined subject imports as DRAM products containing DRAMs fabricated in Taiwan, regardless of assembly location. By contrast, domestic production data categorized as domestic shipments both DRAM products containing U.S.-fabricated dice, regardless of where assembled, and DRAM products containing third-country (but not Taiwan) dice assembled in the United States.[52] In that case, the Commission rejected arguments that domestic production should be defined to include assembly operations of integrated domestic producers when performed on domestically fabricated dice, but should not include assembly of domestic dice by independent domestic assemblers or assembly of third-country fabricated dice by domestic assemblers. It noted –

> While the percentage of domestic inputs used in a product or production process is one of the factors typically considered by the Commission in determining whether an activity constitutes domestic production, it is not generally treated as dispositive. See, e.g., Certain All Terrain Vehicles from Japan, Inv. No. 731-TA-388 (Final), USITC Pub. 2163 at 13-14 (Mar. 1989) (finding that a "modest percentage of domestically-sourced parts or raw materials as a percentage of cost does not necessarily mean that a firm is not a domestic producer"). Moreover, the Commission generally considers this factor (and the other factors) on an industry-wide basis, rather than on a company-by-company basis, as petitioner appears to propose.[53]

The approach taken by the Commission in the Taiwan DRAMs investigation, and the approach that we take here,[54] is consistent with our preliminary determination as well as in other investigations of DRAM (and SRAM) products. Although the identities and activities of the various companies in the U.S. market have fluctuated over the years, the Commission has consistently treated assembly operations as domestic production activities, and therefore the output of those operations, cased DRAMs, must be treated as domestic shipments.[55]

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[50] See, e.g., CR/PR at Table IV-4. In value terms, domestic shipments of DRAM products produced from DRAMs fabricated in third countries (including Samsung Korean-fabricated dice) but assembled in the United States decreased from *** in 2000 to *** in 2001 and increased to *** in 2002 and was *** in interim 2003 compared to *** in interim 2002. See, e.g. id.

[51] Taiwan Final, USITC Pub. 3256 at 7-9.

[52] See Taiwan Prelim., USITC Pub. 3149 at 9 n.45.

[53] Taiwan Final, USITC Pub. 3256 at 9 n.40.

[54] As Hynix admitted, see, e.g., Hynix's Posthearing Brief at Exh. 1 at 62, and the facts on the record in the final phase of this investigation discussed above indicate, the disposition of this issue does not have any significant impact on our analysis. Had we reached a different conclusion regarding this issue, the net effect would be a somewhat higher level of non-subject import shipments and a somewhat lower level of domestic shipments. The volume, market share, and pricing of subject imports would be unaffected.

[55] See, e.g., Japan 64K Final, USITC Pub. 1862 at 11-12; Korea/Taiwan SRAMs Final, USITC Pub. 3098 at 8-10 (appealed on other grounds); Korean I Final, USITC Pub. 2629 at 12-16 (appealed on other grounds).

B. Related Party Analysis

We must further determine whether any producer of the domestic like product should be excluded from the domestic industry pursuant to section 771(4)(B) of the Act. That provision of the statute allows the Commission, if appropriate circumstances exist, to exclude from the domestic industry producers that are related to an exporter or importer of subject merchandise or which are themselves importers.[56] Exclusion of such a producer is within the Commission's discretion based upon the facts presented in each case.[57]

Micron and Infineon argue, and Hynix concedes, that Hynix Semiconductor Manufacturing America ("HSMA") is a related party.[58] HSMA, which has fabrication operations in the state of Oregon, is a wholly-owned subsidiary of Hynix Semiconductor America, an importer of subject merchandise ***.[59] Hynix Semiconductor America, in turn, is a wholly-owned subsidiary of Hynix Semiconductor Inc., a Korean producer of subject merchandise.[60] Because importer Hynix Semiconductor America and exporter Hynix Semiconductor, Inc. are legally or operationally in a position either directly or indirectly to exercise restraint or direction over HSMA, we find HSMA is a related party.

With respect to whether appropriate circumstances exist to exclude HSMA from the domestic industry, the evidence is mixed. Several factors weigh in favor of exclusion. HSMA is not equipped to assemble DRAMs or package DRAM modules, and it sends all uncased DRAMs to Korea for assembly.[61] The corporate headquarters in Korea control decision-making for HSMA, including decisions about what to produce, production operation levels, capital expenditures, research and development, capacity, and process technology, but seek input from HSMA on these issues.[62] Other assembly and packaging operations exist outside Korea, so in theory HSMA could send its uncased DRAMs elsewhere, but as a factual matter, it does not do so.[63] As a practical matter, Hynix *** of HSMA, and reportedly, it would not be economical for the single fabrication facility in the United States to produce the broader product

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[56] See 19 U.S.C. § 1677(4)(B).

[57] See, e.g., Sandvik AB v. United States, 721 F. Supp. 1322, 1331-32 (Ct. Int'l Trade 1989), aff'd mem., 904 F.2d 46 (Fed. Cir. 1990); Empire Plow Co. v. United States, 675 F. Supp. 1348, 1352 (Ct. Int'l Trade 1987). The primary factors the Commission has examined in deciding whether appropriate circumstances exist to exclude the related parties include: (1) the percentage of domestic production attributable to the importing producer; (2) the reason the U.S. producer has decided to import the product subject to investigation, i.e., whether the firm benefits from the LTFV sales or subsidies or whether the firm must import in order to enable it to continue production and compete in the U.S. market; and (3) the position of the related producers vis-a-vis the rest of the industry, i.e., whether inclusion or exclusion of the related party will skew the data for the rest of the industry. See, e.g., Torrington Co. v. United States, 790 F. Supp. 1161, 1168 (Ct. Int'l Trade 1992), aff'd mem., 991 F.2d 809 (Fed. Cir. 1993). The Commission has also considered the ratio of import shipments to U.S. production for related producers and whether the primary interests of the related producers lie in domestic production or in importation. See, e.g., Melamine Institutional Dinnerware from China, Indonesia, and Taiwan, Invs. Nos. 731-TA-741-743 (Final), USITC Pub. 3016 at 14, n.81 (Feb. 1997).

[58] See, e.g., Conference Tr. at 35 (Esch), 117 (Porter).

[59] Compare, e.g., CR/PR at Table III-2 with, e.g., CR/PR at Table IV-3.

[60] See, e.g., CR at III-4, III-5; PR at III-3; questionnaire responses.

[61] See, e.g., CR at III-5; PR at III-3.

[62] See, e.g., Hearing Tr. at 237-38 (Tabrizi); Hynix's Posthearing Brief at Exh. 1 at 51-52. At the Preliminary Conference, Mr. Swanson testified that Hynix negotiates with global customers for DRAMs from all of its fabs – Korean and U.S. – together, and he noted that most customers do not qualify by source of fabrication. See, e.g., Conference Tr. at 125-26 (Swanson).

[63] See, e.g., CR at III-4 to III-5; PR at III-3.

range required by purchasers in the U.S. market.[64] Hynix opposes the petition,[65] and as a ratio to its affiliate's U.S. production, Hynix Semiconductor America's subject imports to the U.S. market in billion bits was *** percent in 2000, *** percent in 2001, *** percent in 2002, and was *** percent in interim 2003 compared to *** percent in interim 2002.[66]

On the other hand, several factors weigh against exclusion. HSMA has operated a wafer fab in Eugene, Oregon *** production began in 1998.[67] The facility, which accounted for *** percent of domestic production of uncased DRAMs in 2002,[68] processed ***.[69] The original cost of HSMA's fixed assets is ***,[70] and ongoing investments in the Eugene facility indicate a continuing commitment to maintaining a presence in the United States.[71]

Late in the period of investigation, Hynix revised *** at the request of staff, but this information was not submitted in time for inclusion in the prehearing version of the staff report.[72] Before the revised data had been submitted, Micron argued that ***, such that appropriate circumstances existed to exclude HSMA from the domestic industry. After the revised data had been submitted, however, Micron argued that it no longer believed that appropriate circumstances exist to exclude HSMA from the domestic industry.[73] Although ***, HSMA reported capital expenditures *** the period of investigation ***.[74] As a ratio to net sales, HSMA's operating income (loss) ***.[75] Thus, any benefit received from its affiliate's importing activities ***. Any effect of ***;[76] likewise, it is true that HSMA was not the corporate entity responsible for subject imports, but rather the importer of record was a different entity of the same corporate family.

No party now argues that appropriate circumstances exist to exclude HSMA from the domestic industry,[77] and on the whole, we find that appropriate circumstances do not exist to do so. We note that ***.[78]

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[64] See, e.g., CR at II-5; PR at II-3.

[65] See, e.g., CR/PR at Table III-1.

[66] See, e.g., CR/PR at Table III-2.

[67] See, e.g., CR at III-4 to III-5; PR at III-3.

[68] See, e.g., CR/PR at Table III-1.

[69] See, e.g., CR at III-4 to III-5; PR at III-3.

[70] See, e.g., CR/PR at Table VI-4.

[71] For example, ***. See, e.g., CR at III-4 to III-5; PR at III-3.

[72] Compare, e.g., Prehearing Staff Report Section VI Tables with, e.g., CR/PR Section VI Tables. Prior to the revision, HSMA ***. Staff requested HSMA to report its transfers to its Korean parent at market value. Following the revision, HSMA's ***.

[73] Compare, e.g., Micron's Prehearing Brief at 14-18 with, e.g., Micron's Posthearing Brief at Exh. 3 at 13-15.

[74] See, e.g., CR/PR at Table VI-4.

[75] See, e.g., CR/PR at Table VI-3.

[76] See, e.g., CR at III-4 to III-5; PR at III-3.

[77] See, e.g., Micron's Posthearing Brief at Exh. 3 at 13-15; Infineon's Posthearing Brief at Exh. 1 at 12-13; Hynix's Posthearing Brief at Exh. 1 at 63.

[78] Our related party analysis also included review of record information concerning domestic producers ***. None of the parties argued that appropriate circumstances exist to exclude any of these producers from the domestic industry. See, e.g., Micron's Posthearing Brief at Exh. 4 at 6; Hynix's Posthearing Brief at Exh. 1 at 63. Because *** an importer of subject merchandise, is legally or operationally in a position to exercise restraint or direction over ***, we find that *** is a related party. We do not find appropriate circumstances exist to exclude *** from the domestic industry, however, because ***. See, e.g., CR at ***; PR at ***; CR/PR at Table III-1; compare, e.g., CR at ***; PR at *** with, e.g., CR/PR at Table VI-3.

*** reported purchases of imported subject merchandise during the period of investigation. To the extent that domestic producers directly or indirectly control the foreign producers or importers through their purchases of subject imports, then they may be considered a related party. The threshold question is whether the purchases establish that the purchaser is "related" for purposes of the statute by directly or indirectly controlling an exporter or

Accordingly, we define the domestic industry for purposes of this investigation as Micon, Dominion, Infineon, Samsung Austin Semiconductor, HSMA, Fujitsu, IBM, Payton, and NECELAM.

III. MATERIAL INJURY BY REASON OF SUBSIDIZED SUBJECT IMPORTS[79]

In the final phase of countervailing duty investigations, the Commission determines whether an industry in the United States is materially injured by reason of the imports under investigation.[80] In making this determination, the Commission must consider the volume of imports, their effect on prices for the domestic like product, and their impact on domestic producers of the domestic like product, but only in the context of U.S. production operations.[81] The statute defines "material injury" as "harm which is not inconsequential, immaterial, or unimportant."[82] In assessing whether the domestic industry is materially injured by reason of subject imports, we considered all relevant economic factors that bear on the state of the industry in the United States.[83] 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."[84]

For the reasons discussed below, we determine that the domestic industry is materially injured by reason of subject imports of DRAM products from Korea that Commerce found to be subsidized by the Government of Korea.

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importer. In other investigations, the Commission has found direct or indirect control to exist where a domestic purchaser was responsible for a predominant share of the imports of the entity arguably within its control, and these purchases were substantial. See, e.g., Certain Cut-to-Length Steel Plate from the Czech Republic, France, India, Indonesia, Italy, Japan, Korea, and Macedonia, Invs. Nos. 701-TA-387-392, 731-TA-815-822 (Prelim.), USITC Pub. 3181 at 12 (Apr. 1999); Certain Brake Drums and Rotors from China, Inv. No. 731-TA-744 (Prelim.), USITC Pub. 2957 at 11 & n.55 (Apr. 1996); Certain Carbon Steel Butt-Weld Pipe Fittings from China and Thailand, Invs. Nos. 731-TA-520-521 (Final), USITC Pub. 2528 at 12 (June 1992).

*** purchases of subject imports fabbed by Hynix were not substantial, amounting in billions of bits to *** in 2000, *** in 2001, *** in 2002, *** in interim 2002 and *** in interim 2003. See, e.g., CR/PR at Table III-2; questionnaire responses of ***. Accordingly, we do not find that *** is a related party by virtue of its purchases of subject imports.

Although *** purchases of subject imports fabbed by Hynix could be characterized as substantial, amounting in billions of bits to *** in 2000, *** in 2001, *** in 2002, *** in interim 2002, and *** in interim 2003, particularly when compared to its ***, ***'s purchases did not make it responsible for a predominant share of the subject imports, and no party argued, nor is there any other indication that *** directly or indirectly controlled any of the Hynix entities. See, e.g., CR/PR at Tables III-2, IV-2. Accordingly, we do not find that *** is a related party. In any event, we note that ***. See, e.g., CR/PR at Table III-2, VI-3.

[79] Negligibility is not an issue in this investigation because subject imports from Korea constituted *** percent of total imports of DRAMs in the most recent twelve months prior to the filing of the petition for which data are available, and are thus not negligible. See, e.g., 19 U.S.C. § 1677(24); CR/PR at Tables IV-1, IV-2.

[80] See 19 U.S.C. § 1671d(b).

[81] See 19 U.S.C. § 1677(7)(B)(i). The Commission "may consider such other economic factors as are relevant to the determination" but shall "identify each [such] factor . . . [a]nd explain in full its relevance to the determination." 19 U.S.C. § 1677(7)(B); see also, e.g., Angus Chemical Co. v. United States, 140 F.3d 1478 (Fed. Cir. 1998).

[82] 19 U.S.C. § 1677(7)(A).

[83] See 19 U.S.C. § 1677(7)(C)(iii).

[84] 19 U.S.C. § 1677(7)(C)(iii).

A. Conditions of Competition and the Business Cycle

1. Demand Considerations

Historically, demand for more and faster memory has risen each year.[85] During the period of investigation, apparent domestic consumption of DRAMs and DRAM modules, in terms of billions of bits, increased from 98.8 million in 2000 to 146.7 million in 2001 and 186.9 million in 2002, and was 55.3 million in interim 2003 compared to 42.8 million in interim 2002.[86] Demand for DRAMs and DRAM modules is derived from and driven by the demand for end-use products such as computers and peripheral equipment, communications equipment, and game consoles.[87]

Most DRAMs and DRAM modules are used in computers or peripheral equipment, and are sold to three types of customers – major PC manufacturers ("PC OEMs"), manufacturers of other electronic equipment such as communications equipment, and purchasers other than OEMs. Many of the non-OEM customers are producers of memory or video modules, which are often sold to PC OEMs, and contract electronic manufacturers. Of the pricing data collected by the Commission, sales to non-OEMs accounted for the majority of the revenues for cased DRAMs whereas PC OEMs accounted for the vast majority of the revenues on sales of DRAM modules.[88] There are also some sales through authorized electronics distributors.[89]

DRAMs typically account for a relatively small share of the overall cost of the products in which they are used, and there are few ready substitutes for DRAM products.[90] Accordingly, demand for DRAMs is relatively price inelastic, which means that falling DRAM product prices would not have the offsetting benefit to DRAM producers of stimulating substantial new demand for DRAM products.[91]

2. Supply Considerations

Due to rising demand for more and faster memory, the DRAM products market is characterized by rapid technological advancements in terms of density (the amount of memory contained in a chip),[92] die shrinks (the number of chips that can be produced on a wafer of a certain size),[93] and addressing technology (which affects interface speed – the speed with which a DRAM product can be accessed by other elements of a computer). Each time a producer moves to a new density, die shrink, or addressing

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[85] See, e.g., Micron's Prehearing Brief at Exhs. 5, 6.

[86] See, e.g., CR/PR at Table IV-4.

[87] See, e.g., CR at II-7; PR at II-5; Hynix's Prehearing Brief at 10, 61.

[88] (Derived from questionnaire responses).

[89] See, e.g., CR at I-15, II-1; PR at I-11, II-1.

[90] Questionnaire responses indicate that DRAMs and DRAM modules account for a small share of the overall cost of most electronic equipment: approximately 3 to 15 percent of the cost of a PC or laptop and a slightly higher share of the total cost of a server; 10 to 20 percent of the total cost of game consoles; less than one percent of the total cost of network equipment; 13 to 15 percent of the total cost of graphics cards; and 1 to 2 percent of the total cost of digital equipment such as PDAs and DVD players. See, e.g., CR at II-7; PR at II-5.

[91] See, e.g., CR at II-16; PR at II-9.

[92] In the early 1970s, DRAM semiconductors ("chips") with a density of 1,024 storage cells or bits per chip (1 kilobit or 1Kb) were introduced. Since then, improvements in semiconductor processing and circuit design have allowed for continued increases in density. Throughout the 1970s and 1980s, 4Kb, 16Kb, 64Kb, 256Kb, 1Mb, and 4Mb DRAMs were introduced. During the 1990s through 2002, 16Mb, 64Mb, 128Mb, 256Mb, and 512Mb chips entered the market. See, e.g., CR at I-9; PR at I-7.

[93] Die shrinks are often achieved by improving designs for use on existing equipment, by purchasing and utilizing newer equipment capable of producing smaller device sizes, or a combination of the two. See, e.g., CR at I-13; PR at I-10.

technology, it starts a new "learning curve" or product life cycle. At the beginning of the product life cycle, production costs tend to be relatively high and production yields (the percentage of usable dice obtained from a single wafer) relatively low. As each product moves through its life cycle, experience is gained and production volume increases, resulting in declining costs and rising yields. Producers also strive to condense the manufacturing cycle time by reducing the number of production steps. Price trends are generally correlated with the product life cycle. Prices start high for a new, state-of-the-art product, decline rapidly as the product becomes a commodity, and continue to decline until the product is replaced by the next generation of technology; prices may increase slightly once the product becomes a "legacy" product, to the extent that supply of the product is more limited.[94]

To keep abreast of new technology, DRAM producers must invest constantly in new capital equipment as well as research and development and maximize capacity utilization.[95] The cost of constructing a new fab facility (including equipment) presently exceeds $2 billion, and the cost of a new assembly facility is estimated at $300 million.[96] To meet rising U.S. and global demand, capacity to produce DRAMs has increased over the period of investigation both in the United States and globally.[97] Production capacity (in terms of bit output) can be increased in two ways: increasing wafer starts (i.e., by constructing a new fab) or by producing more bits per wafer (i.e., shrinking die sizes).[98] The scale on which DRAM production must take place assures that the opening of a new fab or the introduction of a new die shrink results in a large immediate increase in production capacity. Because growth in demand for DRAM products has been continuous but supply increases are sporadic, supply and demand in the DRAM products market tend to be chronically out of equilibrium.[99] Historically, because of the stark product life cycles and the chronic disequilibrium between supply and demand, the DRAM market has, since its inception in the 1970s, been characterized by repeated periods of "boom" and "bust."[100] *** attributes this cycle to the time lags involved in adding new capacity, and notes that a full cycle usually lasts about four years. Domestic producer *** notes that historically, three years of positive growth were followed by one year of losses, but that more recently, periods of loss have been lengthening and periods of growth growing shorter.[101]

During at least part of the period of investigation, eight firms performed wafer fabrication in the United States (Micron, Dominion, Fujitsu, HSMA, Samsung Austin Semiconductor, IBM, Infineon, and NECELAM), five firms performed DRAM assembly operations in the United States (Micron, Infineon, IBM, Payton, and NECELAM), and two of those firms that both fabricated and assembled DRAMs also packaged DRAM modules domestically.[102] U.S. shipments of "domestic" DRAM products made from U.S. dice as well as non-subject foreign dice assembled in the United States increased in billions of bits

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[94] See, e.g., CR at I-11 to I-13, I-15 to I-16; PR at I-8 to I-11; Hynix's Prehearing Brief at 10-12, 67-72; Micron's Postconference Brief at 15-16, 35-36; Conference Tr. at 47-49 (Appleton).

[95] See, e.g., Hynix's Prehearing Brief at 11, 64; Micron's Prehearing Brief at 25-28.

[96] See, e.g., CR at I-11 to I-12; PR at I-8 to I-9.

[97] See, e.g., CR/PR at Tables II-4, C-1; Hynix's Prehearing Brief at 63-66, 112-23. Although the domestic industry's wafer starts declined over the period of investigation, production quantity in billions of bits increased as domestic producers produced more bits per wafer.

[98] See, e.g., CR at I-13; PR at I-10. A third way is to use silicon wafers with larger diameters. During the period of investigation, the standard diameter was 8 inches, but some producers in the world planned or began the transition to 12-inch diameter wafers.

[99] See, e.g., CR at I-13, II-6; PR at I-10, II-4; Hynix's Prehearing Brief at 61-66.

[100] See, e.g., Hynix's Prehearing Brief at 9-13, 61-66; Micron's Prehearing Brief at 31-34.

[101] See, e.g., CR at II-6; PR at II-4; Micron's Posthearing Brief at Exh. 1 at 28; Micron's Prehearing Brief at 31-40; Hynix's Prehearing Brief at 9-13; Hearing Tr. at 173-74 (Tabrizi).

[102] See, e.g., CR at III-1; PR at III-1; CR/PR at Table III-1. ***.

from 42.9 million in 2000 to 50.3 million in 2001 to 57.4 million in 2002, and was 16.5 million in interim 2003 compared to 13.0 million in interim 2002.[103]

In addition to subject DRAMs and DRAM modules from Korea, there were also shipments into the U.S. market of DRAMs and DRAM modules made from DRAMs fabbed and assembled in third countries as well as shipments of non-subject DRAMs and DRAM modules made from DRAMs fabbed by Samsung in Korea.[104] During the period of investigation, the volume of U.S. shipments of non-subject imports in billions of bits increased from *** in 2000 to *** in 2001, and to *** in 2002, and was *** in interim 2003 compared to *** in interim 2002.[105] As a share of apparent domestic consumption by quantity, non-subject imports increased from *** percent in 2000 to *** percent in 2001 and *** percent in 2002, and were *** percent in interim 2003 compared to *** percent in interim 2002.[106]

3. Additional Considerations

DRAMs are considered commodity products and compete largely on the basis of price.[107] Questionnaire responses indicate that within the DRAM product family, DRAMs of similar density, access speed, and variety (regular DRAM, VRAM, SGRAM, etc.) are generally interchangeable regardless of the country of fabrication.[108] Substitutability also exists between similarly configured DRAMs of different density, but to a more limited degree.[109] In addition, though perhaps less common, a limited degree of interchangeability appears to exist among different varieties of DRAMs as well as among those with different addressing modes/access speeds.[110] In the short term, prices may differ for technologically advanced or specialty DRAMs, which begin their life cycles as high-revenue-generating products. However, as products exit the introductory phase of their cycle and an increasing number of suppliers join the market, DRAMs are rapidly transformed into commodity goods. Largely because of the perpetual improvements in production efficiencies experienced by this industry, prices are usually declining.[111] According to Micron, there has been about a 20 to 30 percent decline in the price of

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[103] See, e.g., CR/PR at Table IV-4. "Domestic" product includes DRAMs and DRAM modules made from (1) U.S.-fabricated dice, regardless of assembly location, and (2) Samsung Korean-fabricated dice that were assembled in the United States (***), and (3) 3rd-source-fabricated dice that were assembled in the United States. Data presented are net of company transfers of uncased and cased DRAMs that were used by reporting producers of the domestic like product to make the downstream subject DRAM products. If applicable, adjustments for producer purchases of the upstream product destined for downstream production were made to avoid double counting. See id. at n.1.

[104] See, e.g., CR/PR at Table IV-4.

[105] See, e.g., CR/PR at Table IV-4.

[106] See, e.g., CR/PR at Table IV-5.

[107] See, e.g., CR at I-13; PR at I-9; Hynix's Prehearing Brief at 15; Infineon's Prehearing Brief at 4-5; Micron's Prehearing Brief at 29-31; Hearing Tr. at 66-67 (LeFort), 173 (Tabrizi).

[108] See, e.g., CR at I-14; PR at I-10. For example, a 64Mb SDRAM manufactured by a Korean producer should be fully interchangeable with a similarly configured domestically produced device, as well as with a non-subject import. See id.

[109] See, e.g., CR at I-14; PR at I-10. For example, for use in a memory module, two 64Mb SDRAMs can be interchangeable with one 128Mb SDRAM. See id.

[110] See, e.g., CR at I-14; PR at I-10. It appears, however that this substitution often must occur during the design of the electronic system. For example, according to numerous questionnaire responses, after an electronic system has been designed to operate using a specific type of DRAM, the system would likely not function optimally using a different type. Similarly, with regard to the different addressing modes, once a memory controller has been designed for an electronic system, a specific addressing mode such as EDO or SDRAM has also been incorporated into the design. See, e.g. id.; Hearing Tr. at 66-67 (LeFort), 173 (Tabrizi), 248-49 (Swanson).

[111] See, e.g., Hynix's Prehearing Brief at 15; Micron's Prehearing Brief at 40.

DRAMs on an annual basis attributable to improvements in production; according to Hynix, in recent periods average price declines have been higher, above 40 percent.[112] During the period examined in the final phase of this investigation, the unit value of DRAMs sold in the U.S. market (on a per billion bit basis) declined from $118 in 2000 to $32 in 2001, $25 in 2002, $32 in interim 2002, and $18 in interim 2003, or declined by 73 percent from 2000 to 2001, 22 percent from 2001 to 2002, and 44 percent between interim periods.[113]

The parties agreed that the increasingly global nature of the DRAMs market, both in terms of producers as well as purchasers, is an important consideration.[114] For example, in addition to its U.S. facilities, Micron operates wholly-owned wafer fabs in Italy and Japan, a joint venture fab in Singapore, an assembly and test facility in Singapore, and module packaging plants in Scotland and Singapore.[115] Infineon is a global DRAM producer with facilities in Germany, Portugal, and Malaysia, and a joint venture in Taiwan, as well as the United States.[116] NECELAM's parent company, NEC, joined with Hitachi and Mitsubishi of Japan to form a joint venture known as Elpida Memory, Inc. ("Elpida"), whose members continue to produce DRAMs in their facilities outside the United States.[117] In addition to their U.S. fabs, both Hynix and Samsung have fabrication, assembly, and module packaging operations in Korea.[118] The major purchasers of DRAMs and DRAM modules are multinational computer equipment manufacturers that source DRAMs and DRAM modules globally.[119] Responding purchasers with locations both within and outside the United States that reported negotiating globally for all locations include ***.[120] The commodity nature of standard DRAMs and low transportation costs mean that DRAMs and DRAM modules can easily be shifted from one customer location to another, or purchases shifted from one source to another. During the period of investigation, *** reported U.S. shipments of DRAMs and DRAM modules fabricated in the United States as well as shipments of products fabricated outside the United States. The major DRAM producers can and do shift DRAMs and DRAM production to and from alternative markets.[121]

DRAM products, including DRAM products from Korea, have been the subject of prior antidumping duty investigations in the United States. On April 22, 1992, Micron filed an antidumping duty petition alleging that an industry in the United States was materially injured and threatened with further material injury by reason of DRAM products of one megabit and above from Korea. The Commission found the domestic industry to be materially injured by reason of subject imports of DRAM products from Korea.[122] On November 2, 1999, Commerce initiated and the Commission instituted five-year reviews of the antidumping duty order on DRAM products from Korea.[123] Before Commerce had

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[112] See, e.g., Infineon's Prehearing Brief at 9-10; Micron's Prehearing Brief at 40-41; Hearing Tr. at 121-26 (Sadler, Appleton), 149-53 (LeFort, Appleton); Hynix's Posthearing Brief at 40-41, Exh. 19.

[113] See, e.g., CR at I-15 to I-16; PR at I-11 (and derived from CR/PR at Table IV-4).

[114] See, e.g., Micron's Prehearing Brief at 23-25; Hynix's Prehearing Brief at 14-22; Hearing Tr. at 173-75 (Tabrizi).

[115] See, e.g., CR at II-2, III-3; PR at II-2, III-2.

[116] See, e.g., CR at II-2, III-6; PR at II-2, III-4.

[117] See, e.g., CR at III-7; PR at III-5.

[118] See, e.g., CR at II-2, III-4 to III-5, III-8; PR at II-2, III-3, III-5.

[119] See, e.g., Hynix's Prehearing Brief at 18-21; Micron's Prehearing Brief at 23.

[120] See, e.g., Hynix's Prehearing Brief at 59-60; Micron's Prehearing Brief at 23-25.

[121] See, e.g., CR at II-2 to II-3; PR at II-2. The record also indicates that a significant and increasing share of domestic production was exported over the period of investigation; in interim 2003, exports exceeded U.S. shipments. See, e.g., CR/PR at Tables III-6, C-1.

[122] See Korean I Final, USITC Pub. 2629; Korean I Remand, USITC Pub. 2997. The Commission's remand determination was affirmed. See Hyundai Electronic Industries Co., Ltd. v. United States, 21 CIT 481, 1997 WL 250496 (1997).

[123] See 64 Fed. Reg. 59160; 64 Fed. Reg. 59202.

issued the final results of its full five-year review, and before the Commission held a hearing in its five-year review of the order, Micron withdrew its notice of intent to participate in Commerce's five-year review and stated its support for revocation of the order. Because no domestic interested party was thus participating in the five-year review, Commerce revoked the order on October 5, 2000,[124] and the Commission terminated its five-year review investigation effective the same date.[125]

In this investigation, the parties disagreed about the relevance, if any, of Commerce's subsidy findings in the context of any present material injury analysis.[126] We have considered information on the subsidies received by Hynix as a condition of competition in the DRAMs market.[127] Micron described a series of Korean-government directed bailouts of Hynix through 2002 amounting to $16 billion in subsidies.[128] Hynix claims that Micron's $16 billion figure is vastly overstated and includes periods that were outside of Commerce's period of investigation.[129] Commerce found that the Government of Korea directed credit to "strategic" industries, such as steel, automobiles, semiconductors, and consumer electronics throughout the 1970s, 1980s, and 1990s. In its final determination, Commerce found that the Government of Korea directed credit to the Korean semiconductor industry through 1998 and specifically to Hynix and companies that continue to be, or were part of, the Hyundai Group from 1999 through June 30, 2002. Specific financial contributions made pursuant to the Government of Korea's direction of credit included loans, convertible bonds, extensions of maturities (which Commerce viewed as new loans), D/A financing, usance financing, overdraft lines, debt forgiveness, and debt-for-equity swaps that Commerce determined were direct transfers of funds from the government-directed financial institutions.[130] Commerce found Hynix was uncreditworthy between January 1, 2000 and June 30, 2002, and at the time of the October 2001 debt-to-equity swap, Hynix was unequityworthy. Commerce determined that the total net countervailable subsidy for Hynix over the period January 1, 2001 to June 30, 2002 was approximately $2 billion, or a subsidy rate of 44.71 percent ad valorem.[131]

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[124] See 65 Fed. Reg. 59391 (Oct. 5, 2000).

[125] See 65 Fed. Reg. 60975 (Oct. 13, 2000).

[126] In addition to considering the subsidies in any threat of material injury context, Micron and Infineon argued that the Commission may consider the effect of the subsidy in the present material injury context under various statutory provisions. See, e.g., Micron's Posthearing Brief at 13 n.8, Exh. 1 at 10-16, Exh. 2 at 7-16; Micron's Prehearing Brief at 18-22; Infineon's Posthearing Brief at Exh. 1 at 13-16; Hearing Tr. at 43-45 (Appleton), 108-16 (Kaplan, Cannon, Rosenthal). Hynix argued that for current injury, the statutory focus must be on the actual volume of subject imports and the actual price effects of those imports. See, e.g., Hearing Tr. at 202-08 (Durling), 241-42 (Durling); Hynix's Posthearing Brief at Exh. 1 at 5-8, 15-16.

[127] At a minimum, the pattern of Korean government action permitted Hynix to continue operations uninterrupted by bankruptcy or other disruption, and as such, form part of the context under which subject imports competed in the U.S. market over the period examined. Nevertheless, we base our determination on the statutory factors concerning the volume, price, and impact of subject imports on the domestic industry, as discussed in the following sections of these views.

[128] See, e.g., Micron's Prehearing Brief at 65, 95-96, Exh. 11; Infineon's Posthearing Brief at 12-13, Exh. 1 at 24-29; Infineon's Prehearing Brief at 29-36.

[129] See, e.g., Hynix's Posthearing Brief at 7, n.10 & Exh. 10.

[130] Commerce calculated the benefit from all of these financial contributions and divided the total benefit by the company's total sales value during the period of investigation. On that basis, Commerce determined the net countervailable subsidy from these financial contributions to be 44.48 percent ad valorem for Hynix. See, e.g., CR at I-3; PR at I-3. Commerce also found countervailable benefits from two other Korean Government programs. Id.

[131] See Commerce's Decision Memorandum at 6-11, 83-92; 68 Fed. Reg. 37122 (June 23, 2003); see also PR at I-3 & n.9.

B. Volume of the Subject Imports

Section 771(C)(i) of the 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."[132]

As an initial matter, for purposes of this determination and as in the preliminary and in previous determinations,[133] we focused on bits for purposes of assessing the volume of imports, because total bits are a uniform measure of the quantity of DRAM products.[134] We recognize, however, that the use of bits as a unit of measurement can present difficulties for our analysis, as total bits are a function of chip density and product mix, both of which have changed over the period of investigation. Accordingly, we do not view the increase in subject imports in the DRAM products market measured in terms of bits the same way we might view an increase of such magnitude in the volume of imports of another product. Nevertheless, we find that the absolute volume of subject imports and the increase in that volume over the period of investigation relative to production and consumption in the United States is significant.

Apparent domestic consumption of DRAM products measured in billions of bits increased each year of the period of investigation from 98.8 million in 2000 to 146.7 million in 2001 and 186.9 million in 2002, and was 55.3 million in interim 2003 compared to 42.8 million in interim 2002.[135] The volume of subject imports in billions of bits increased from *** in 2000 to *** in 2001 and *** in 2002, and was *** in interim 2003 and *** in interim 2002.[136]

In terms of their share of apparent domestic consumption, shipments of subject imports increased from *** percent in 2000 to *** percent in 2001, then declined to *** percent in 2002, a level that was still significantly higher than in 2000. Such shipments were *** percent in interim 2003 compared to *** percent in interim 2002.[137]

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[132] 19 U.S.C. § 1677(7)(C)(i).

[133] See, e.g., Taiwan Final, USITC Pub. 3256.

[134] We relied on questionnaire responses in this investigation rather than other possible sources of information. We are unable to rely on official import statistics from Commerce because for tariff and marking purposes, Customs determines the country of origin for DRAMs based on the assembly location. The various bases for determining the origin of goods of heading 8542 of the HTS are set forth in Customs' regulations at 19 C.F.R. § 102.20 based on the types and location of processing (including mounting of the chip, dice, or wafer and the programming of the chip) done for each import shipment. Moreover, these HTS statistical categories also contain non-subject products. See, e.g., CR at I-6, IV-1 & n.3; PR at I-5, IV-1 & n.3. These bases differed from the definitions used in this investigation to define subject imports, non-subject imports, the domestic like product, and shipments thereof. Nor did we rely on public sources cited by Hynix in its briefs and during hearing testimony because these were also compiled on a different basis (e.g., on a brand-name basis) than our questionnaire responses. The trends and relationships among the data suggested by such other sources do not necessarily coincide with, and in some cases differ from the trends and relationships evident in the confidential questionnaire responses collected in this investigation.

[135] See, e.g., CR/PR at Table C-1.

[136] See, e.g., CR/PR at Table IV-4.

[137] See, e.g., CR/PR at Table C-1.

Compared to U.S. production of uncased DRAMs,[138] the ratio of total subject imports increased from *** percent in 2000 to *** percent in 2001, then declined to *** percent in 2002, a level that was still *** that of 2000, and was *** percent in interim 2003 compared to *** percent in interim 2002.[139]

Hynix submitted monthly shipment data for the period January 2002 to March 2003 in support of its argument that the Commission should not discount post-petition information, but we find that these data support the opposite conclusion. The volume of Hynix's subject imports for first-quarter 2003 is lower than for first-quarter 2002, and the volume of subject imports for each of the first three months of 2003 is lower than in the corresponding months of 2002.[140] We find that the change in the volume of subject imports since the filing of the petition in November 2002 is related to the pendency of this investigation.[141] We accordingly reduce the weight accorded to the data for the period after the filing of the petition (i.e., interim 2003 data).[142]

We note that non-subject imports increased market share from *** percent in 2000 to *** percent in 2002, and their market share was *** percent in interim 2002 and *** percent in interim 2003. Thus non-subject imports increased market share by a substantially larger amount than subject imports.[143] Nevertheless, as discussed later in these views, subject import volume and pricing were themselves sufficient to have a significant negative impact on the domestic industry.

Based on the record, we find that the volume of subject imports as well as the increase in that volume over the period of investigation relative to apparent domestic consumption and production in the United States is significant. Our findings about the volume of subject imports are reinforced by the substantial degree of substitutability between subject imports and domestic shipments, discussed below. The commodity-like nature of domestic and subject imported DRAM products magnifies the ability of a given volume of imports to impact the domestic market and industry.

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[138] Indeed, compared to U.S. shipments of DRAMs and DRAM modules, the ratio of subject imports increased from *** percent in 2000 to *** percent in 2001 and *** percent in 2002 and was *** percent in interim 2002 and *** percent in interim 2003. (Derived from CR/PR at Table IV-5).

[139] See, e.g., CR at IV-2; PR at IV-3. Hynix argues that the Commission should evaluate the significance of subject imports in terms of the market share of the Hynix brand in the U.S. market. It claims that the combined U.S. market share of U.S.-made and Korean-made Hynix DRAM products declined over the period examined, due in large part to the reduced production from Hynix's Eugene facility while that facility was being upgraded in 2001 and then returning to full production in 2002. See, e.g., Hynix's Posthearing Brief at 1, 4, Exh. 1 at 42-43, 48-51; Hearing Tr. at 188-90 (Durling), 231-236 (Porter), 263-266 (Tabrizi).

Hynix's proposed analysis is inconsistent with prior Commission practice. Moreover, the statute explicitly requires the Commission to examine the volume of imports of "the subject merchandise," in this case the volume of subject DRAM products produced by Hynix in Korea. 19 U.S.C. §1677(7)(B)(i)(I). Whether or not Hynix's U.S. production was reduced, the increasing volume and market share of subject imports from Korea is an indication of the significance of those imports in the U.S. market.

In addition, we note that Hynix ***. CR at II-3 n.4; PR at II-2; Micron's Posthearing Brief, Exh. 1. Hynix's decision to ***.

[140] See, e.g., Hynix's Posthearing Brief at Exh. 1 at 17.

[141] This finding is not inconsistent with record information showing an increase in the volume of subject imports from Korea between 2000 and 2001, after the October 5, 2000, revocation of the previous antidumping duty order on DRAMs from Korea and the restraining effects that it may have had on subject imports from the Hynix companies. See, e.g., CR/PR at Table IV-3; 65 Fed. Reg. 59391 (Oct. 5, 2000).

[142] See 19 U.S.C. § 1677(7)(I).

[143] See, e.g., CR/PR at Table C-1.

C. Price Effects of the Subject Imports

Section 771(C)(ii) of the 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.[144]

The degree of substitution between domestic and imported DRAMs and DRAM modules depends upon such factors as DRAM type (e.g., density, addressing mode), relative prices, quality (e.g., 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.). Nineteen of twenty-one responding producers and importers of DRAMs and DRAM modules reported that domestically produced DRAMs and DRAM modules are generally used interchangeably with subject imports, and twenty-two of twenty-three responding producers and importers reported that there are no important differences in product characteristics or sales conditions between domestic and subject DRAMs and DRAM modules.[145] Throughout the period of investigation, Hynix produced many of the same product densities as domestic producers and ***.[146] Moreover, the parties agree that DRAMs and DRAM modules produced in the United States are largely sold to the same customers and through the same channels of distribution as subject DRAMs and DRAM modules.[147] For these reasons, we find that there is a high degree of substitutability between the domestic and subject products.

As discussed above, DRAM products are typically sold to three types of purchasers – PC OEMs, manufacturers of telecommunications or other electronic equipment, and non-OEMs (many of which produce memory or video modules or are contract manufacturers). Some purchasers of DRAMs and DRAM modules, particularly major PC OEMs, purchase products under contracts from multiple sources, including most if not all of the major producers of DRAM products. These contracts for multiple shipments generally do not specify price and quantity, but may specify the percentage of overall purchases or a range of overall purchases awarded to a supplier. Prices are negotiated and purchase shares allocated for fairly short periods of time (including for intervals of one week to three months), often two weeks. This practice protects the purchasers from possible disruptions in supply from any one source. It also keeps purchasers aware of the prices offered by multiple vendors, and through feedback from purchasers, keeps producers aware of competing prices.[148] Thus, although purchasers reported

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[144] 19 U.S.C. § 1677(7)(C)(ii).

[145] See, e.g., CR/PR at Table II-2. As questionnaire responses of domestic producers, importers, and purchasers explained, there is little perceived difference in product characteristics or sales conditions between similarly configured domestically produced DRAMs and subject imports. See, e.g., CR at I-14; PR at I-10; Hearing Tr. at 45-46 (Sadler). Indeed, only 8 of 24 responding purchasers reportedly always know the country of fabrication for their purchases of DRAMs and DRAM modules. See, e.g., CR at II-9; PR at II-6.

[146] See, e.g., CR/PR at Table II-3.

[147] See, e.g., CR at II-2 to II-3 & n.3, II-8; PR at II-2 and n.3, II-5; CR/PR at Tables II-1, II-2; Micron's Posthearing Brief at Exh. 1 at 1; Hearing Tr. at 176 (Durling). The record indicates that sales under contracts account for at least 50 percent of the sales of ***. See, e.g., CR at V-3; PR at V-2.

[148] See, e.g., CR at II-8, V-3; PR at II-5, V-2. Micron and Infineon argued that practices such as "most-favored-customer" and "blended scaling" ensure the rapid dissemination of information concerning and the immediate effect of lower prices in this market. PC OEMs contacted by staff confirm the existence of pricing practices in which the

changing suppliers infrequently,[149] prices for DRAM products and the share of a purchaser's purchases allocated to a particular supplier change frequently.

Price is important to purchasers, who ranked price as the second most important factor after quality/technology,[150] a factor that does not differentiate subject imports and the domestic like product. We also find that price trends in the DRAM products industry are generally correlated with the product life cycle. They start high for a new, state-of-the-art product, decline rapidly as the product becomes a commodity, and continue to decline until the product is replaced by the next generation of technology.

The Commission collected data on eight pricing products, all of which were among those sold in the largest volumes by domestic producers and importers of DRAMs and DRAM modules, and all of which are standard DRAM products rather than specialty DRAM products.[151] Pricing products 1 through 5 were for cased DRAMs, and pricing products 6 through 8 were for DRAM modules.[152] Domestic producers and importers were asked to report weighted average f.o.b. prices and quantities of the pricing products sold to PC OEMs, other OEMs, and non-OEMs. Two domestic producers and six importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters. Pricing data reported by these firms accounted for approximately 45.9 percent of U.S. shipments of domestic DRAMs and DRAM modules and 36.9 percent of U.S. shipments of subject imports from Korea in 2002 on a value basis.[153]

According to the pricing data on the record, there was significant price underselling by subject imports during the period of investigation. For the majority of possible comparisons, subject imports undersold the domestic like product, and the margins of underselling were high (often greater than twenty percent). Moreover, the frequency of underselling increased over the period of investigation (from *** percent of possible comparisons in 2000 to *** percent of possible comparisons in 2001 and *** percent of possible comparisons in 2002.[154] While we considered the pricing data pertaining to all products and to all types of purchasers, we also observe that underselling was consistent and substantial for particular

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lowest price in the market has an impact on other prices. Some purchasers have formal most-favored-customer and best-price clauses, and others have less formal arrangements. Purchasers contacted by staff reported no formal arrangements equivalent to "blending" or "scaling;" purchasers, however, noted that similar prices would necessarily be paid for similar devices if the market would not support a price premium for one over the other. For instance, a premium might be paid for a faster speed, or for a SO-DIMM over a DIMM, for two or three quarters after a new device is introduced, but beyond some point, the market will no longer support a premium. See, e.g., CR at II-8 at n.11; PR at II-5 at n.11; see also, e.g., Infineon's Prehearing Brief at 5-8; Infineon's Posthearing Brief at Exh. 1 at 8-11, Exhs. 3, 7, 8; Micron's Posthearing Brief at Exh. 2 at 5-6; Hynix's Posthearing Brief at Exh. 1 at 1-3, 39; Hearing Tr. at 68-71 (LeFort), 73-74 (McGrath), 80-81 (LeFort), 83-87 (LeFort, Appleton, Hausman), 94 (Sadler), 102 (Appleton), 215-17 (Swanson).

[149] (Derived from purchaser questionnaire responses to Question III-15).

[150] See, e.g., CR/PR at Table II-1.

[151] See, e.g., CR at V-4 to V-5; PR at V-3 to V-4. Domestic producers and importers reported that virtually all domestic and subject imported products were standard DRAM products. See, e.g., CR at II-12 to II-13; PR at II-8. As noted above, similarly configured DRAM products from different sources are directly comparable.

[152] As noted above, PC OEMs were the most significant purchasers of DRAM modules, whereas non-OEMs were the most significant purchasers of cased DRAMs, according to the pricing data collected by the Commission.

[153] See, e.g., CR at V-5; PR at V-3.

[154] For cased DRAM sales to PC OEMs, subject imports undersold the domestic like product in 34 of 91 possible comparisons, for cased DRAM sales to other OEMs, subject imports undersold the domestic like product in 67 of 128 possible comparisons, and for cased DRAM sales to non-OEMs, subject imports undersold the domestic like product in 104 of 140 possible comparisons. For module sales to PC OEMs, subject imports undersold the domestic like product in 57 of 95 possible comparisons, for module sales to other OEMs, subject imports undersold the domestic like product in 41 of 67 possible comparisons, and for module sales to non-OEMs, subject imports undersold the domestic like product in 74 of 93 possible comparisons. See, e.g., CR/PR at Table V-18.

high-revenue products to particular channels of distribution at specific points during the period of investigation.[155] In a commodity-type market which adjusts quickly (even biweekly) to price changes, significant quarterly price disparities between suppliers would not usually be expected. Thus, the patterns of frequent, sustained underselling by subject imports, often at high margins, is especially significant in the context of the DRAM market, and can be expected to have particularly deleterious effects on domestic prices.

Hynix argued that the Commission should disaggregate its pricing analysis in this case by brand-name, rather than just comparing the weighted average subject import price with the weighted average price of the domestic like product.[156] Under the statute, the Commission considers the industry as a whole, and it does not ordinarily disaggegate its pricing analysis by company. Subject import prices that are below weighted average domestic prices can impact the market even when they are not the lowest single price in the market at a given point in time. We only give limited weight, therefore, to Tables E-1 through E-5 of the staff report that identify the lowest priced firm in each month by product and channel of distribution.[157] Nevertheless, as these tables indicate, even a disaggregated analysis of the pricing data shows that subject DRAM products from Hynix's Korean facilities were the lowest-priced product *** percent of the time, or more often than DRAM products from any other source.[158]

Prices for nearly every pricing product and channel of distribution declined substantially over the period of investigation.[159] Prices for domestic products and subject imports followed the same general trends and were generally similar for sales to PC OEMs across all products. The product-specific data show price declines of 70 to 90 percent from late 2000 through 2001, a modest rebound in early 2002, then a further decline over the course of 2002. The parties agreed that the price decline in 2001 was the most severe in DRAMs history, and pricing continued to decline in 2002.[160]

The parties disagreed about the reason for these price declines. The record indicates that apparent domestic consumption of DRAM products as measured in billions of bits increased throughout the period of investigation, although it did not increase as much in the later portion as in the earlier portion of the period of investigation.[161] This slowing in the growth of apparent domestic consumption in the latter portion of the period of investigation may be due in part to a decline in the quantity of personal computers sold; 2001 is reported to be the first year for which the number of personal computers sold

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[155] For example, there was significant underselling by subject imports for product *** sold to *** in 2000 and in 2001, product *** sold to *** in late 2000, 2001, and 2002, product *** sold to *** in 2002, product *** sold to *** in 2000 and 2001, and product *** sold to *** in 2002 and interim 2003. For high-revenue products *** sold to ***, there was mixed underselling and overselling, and subject imports from Korea were sold in meaningful volumes, in late 2000 through 2001, when prices declined substantially. (Derived from questionnaire responses). While there are instances in which price declines occurred for particular products/channels in which the participation by subject imports was modest, this does not in our view detract from the overall negative impact of subject imports on the DRAMs pricing environment, as set out in this section.

[156] See, e.g., Hynix's Prehearing Brief at 85-92, Exh. 20.

[157] Data in these tables include only that reported for HSMA, Micron, Infineon's domestic production, Infineon's non-subject imports, Samsung's domestic production, Samsung's non-subject imports, and subject imports from Korea. Data from importers other than HSA, Infineon, and SSI were not included in this analysis. Importers generally did not identify the specific fabricating firm, and were only asked to provide data regarding domestic products and those fabricated in Korea. See, e.g., CR at V-7 to V-8; PR at V-4, V-9.

[158] See, e.g., CR/PR at Tables E-1 to E-5.

[159] See, e.g., CR at V-6; PR at V-4; CR/PR at Table V-1.

[160] See, e.g., Hynix's Prehearing Brief at 51, 62, 106; Micron's Prehearing Brief at 37; Infineon's Posthearing Brief at 9.

[161] See, e.g., CR/PR at Table C-1.

declined rather than increased.[162] Historically, there appears to be no clear correlation between growth of the DRAMs market and price movements.[163] While slowing demand played some role, together with the operation of the DRAMs business cycle and product life cycles, the unprecedented severity of the price declines that occurred from 2000 to 2001 and persisted through 2002 indicates that supplier competition was an important factor. The increasing frequency of underselling by subject imports from 2000 to 2002 corresponds with the substantial decline in U.S. prices over these same years. In the absence of significant quantities of subject Korean product competing in the same product types at relatively low prices, domestic prices would have been substantially higher.

We have considered the possible effects of the increasing volumes of non-subject imports on domestic prices. The frequency with which non-subject imports undersold domestic prices increased between 2000 and 2002. However, the underselling frequency by non-subject imports was lower than, and increased less than, the underselling frequency of subject imports between 2000 and 2002.[164]

Most purchasers did not identify a price leader in the U.S. market. This is not surprising in a commodity industry characterized by frequent (even biweekly) price changes such as the DRAM product market.[165] Nevertheless, *** purchasers of DRAM products contacted by staff regarding lost sales and lost revenue allegations identified Hynix as a source of low-priced DRAM products, and confirmed that the domestic industry lost sales and/or revenues due to competition from Hynix.[166]

We find that the existence of global pricing does not negate the effect of subject imports in the U.S. market. The parties agree that the U.S. market is the largest market for DRAMs.[167] Thus, prices in the U.S. market are a significant constituent element of the overall global pricing environment. We find that the volume and price effects of subject imports from Korea have been significant in the U.S. market.

Accordingly, we find that there is significant price underselling by subject imports, and that the effect of such subject imports has depressed prices to a significant degree.

D. Impact of Subject Imports

In examining the impact of the subject imports on the domestic industry, we consider all relevant economic factors that bear on the state of the industry in the United States.[168] These factors include output, sales, inventories, capacity utilization, market share, employment, wages, productivity, profits,

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[162] See, e.g., Hynix's Prehearing Brief at 61-63, 108-09; Hynix's Posthearing Brief at Exh. 1 at 25. Other reasons for any declines in demand that were mentioned in questionnaire responses are a slump in the telecommunications and network industry and a general recession. See, e.g., CR at II-6; PR at II-4.

[163] See, e.g., Micron's Prehearing Brief at 38-39, Exhs. 5, 6 (e.g., 1996 to 1998 saw rapid DRAM output growth as well as large price declines).

[164] Non-subject imports undersold domestic product 46.6 percent of instances in 2000, 47.7 percent in 2001, and 60.7 percent in 2002. Subject imports undersold domestic product in 51.0 percent of instances in 2000, 56.0 percent in 2001, and 69.8 percent in 2002. CR/PR at Table V-18; questionnaire responses. Consistent with these figures, subject imports undersold non-subject imports in a majority of instances. See, e.g., Infineon's Final Comments at 6-8; Micron's Final Comments at 1, 11-13.

[165] See, e.g., Hynix's Prehearing Brief at 95-96; Micron's Prehearing Brief at 47; CR at II-8; PR at II-5. At the hearing, a Hynix representative indicated that DRAM customers keep confidential the pricing quotes of individual suppliers, making it difficult for a supplier to know its competitors' pricing. Hearing Tr. at 182 (Swanson).

[166] See, e.g., CR/PR at Table V-19.

[167] See, e.g., CR at II-5; PR at II-3; Hynix's Prehearing Brief at 60-61; Micron's Prehearing Brief at 39-40.

[168] See 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." Id. at 885).

cash flow, return on investment, ability to raise capital, and research and development. 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."[169]

Domestic industry performance, as measured by many of the statutory performance factors, declined over the period of investigation. Average domestic production capacity declined from 3.0 million wafers in 2000 to 2.6 million wafers in 2001 then increased to 2.7 million wafers in 2002, a level that was still less than in 2000, and was 669,000 wafers in interim 2003 compared to 660,000 wafers in interim 2002.[170] Domestic production, as measured by wafer starts in terms of 1,000 wafers declined from 2,659 in 2000 to 2,359 in 2001 and increased to 2,509 in 2002, an overall decline, and was 607 in interim 2003 compared to 600 in interim 2002.[171] Domestic industry market share by quantity declined from 43.4 percent in 2000 to 34.3 percent in 2001 and 30.7 percent in 2002, while its market share in interim 2003 was 29.8 percent compared to 30.4 percent in interim 2001.[172] The number of PRWs and hourly wages also generally declined over the period of investigation.[173]

Few factors showed improvement over the period of investigation. The volume of domestic producers' domestic shipments in billions of bits increased from 42.9 million in 2000 to 50.3 million in 2001 and 57.4 million in 2002 and was 16.5 million in interim 2003 compared to 13.0 million in interim 2002.[174] Domestic producers' capacity utilization rate also increased over the period of investigation from 89.7 percent in 2000 to 92.0 percent in 2002, and was 90.7 percent in interim 2003 compared to 90.9 percent in interim 2002.[175] At the same time, however, the record indicates that domestic producers idled certain production capacity during the period of investigation and deferred upgrades and expansions of production facilities and equipment.[176]

Due to a large decline in unit sales value, a $2.7 billion operating income in 2000 was reversed in 2001 when the industry experienced more than $2 billion in operating losses. The domestic industry continued to experience substantial operating losses in the remainder of the period of investigation.[177] As a ratio to net sales, operating income was 32.2 percent in 2000 before declining to losses of 79.2 percent

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[169] 19 U.S.C. § 1677(7)(C)(iii); see also SAA at 851, 885; Live Cattle from Canada and Mexico, Invs. Nos. 701-TA-386 and 731-TA-812 to 813 (Prelim.), USITC Pub. 3155 at 25, n.148 (Feb. 1999).

[170] See, e.g., CR/PR at Table C-1. Hynix claims that domestic industry capacity ***. Hynix's Prehearing Brief at 43-44. In fact, ***. See, e.g., CR/PR at Table D-1.

[171] See, e.g., CR/PR at Table C-1.

[172] See, e.g., CR/PR at Table C-1.

[173] See, e.g., CR/PR at Table C-1. Micron observes that it laid off 10 percent of its workforce in 2003, its first layoffs in over 15 years. See, e.g., Hearing Tr. at 39 (Appleton).

[174] See, e.g., CR/PR at Table C-1. Increases in shipments measured in bits are expected given the DRAMs learning curve and do not necessarily indicate healthy industry performance. From 2000 to 2002, the rate of growth in industry shipments (33.9 percent) lagged the growth in U.S. apparent consumption (89.2 percent). See, e.g., CR/PR at Table C-1.

[175] See, e.g., CR/PR at Table C-1. Due to the capital-intensive nature of this industry, we would expect domestic producers to operate at high capacity utilization levels.

[176] See, e.g., CR at III-2 to III-8; PR at III-1 to III-5 (indicating that ***.)

[177] See, e.g., CR at VI-1 at n.4; PR at VI-1 at n.4; CR/PR at Table C-1; domestic producer questionnaire responses. (Payton's financial information is not included in the data in CR/PR at Table C-1. Because we include Payton in the domestic industry, such information in Table C-1 is considered BPI in order to permit the public release of industry-wide financial information in footnote 4 of CR at VI-1; PR at VI-1). Hynix argues that Micron was harmed by poor business decisions, noting in particular its failure to position itself to be able to capitalize on a pocket of strong demand in a particular market segment in 2002. See, e.g., Hynix's Prehearing Brief at 124-28 (referencing 256 Mb DDR DRAMs), 128-31). Whatever negative effect any particular decisions may have had on Micron, they could not explain the harm experienced by the DRAM products industry as a whole. This harm was not isolated to Micron and was due mainly to lower prices.

in 2001 and 50.8 percent in 2002; operating losses as a share of net sales in interim 2003 were 51.6 percent compared to 17.3 percent in interim 2002.[178] During this time, domestic producers continued to make substantial capital expenditures but at increasingly lower levels, with reported capital expenditures decreasing from $1.8 billion in 2000 to $1.6 billion in 2001 and $*** in 2002; capital expenditures in interim 2003 were $*** compared to $*** in interim 2002.[179]

In sum, the domestic industry's performance declined over the period of investigation with respect to many indicators, and its financial performance worsened precipitously. Declining prices are the primary reason for the industry's large operating losses and, as discussed above, subject imports contributed materially to the steep price declines that occurred over the period.[180]

We acknowledge that the increasing volume of non-subject imports played an important role in the U.S. market during the period of investigation. Non-subject imports were responsible for the bulk of market share lost by domestic producers during the period of investigation. A portion of the non-subject imports are RAMBUS and specialty DRAM products for which domestic producers had no significant production during the period of investigation.[181] These facts and the fact, discussed above, that non-subject imports undersold domestic product at a lower frequency than subject imports did, provide some support for finding that non-subject imports had less impact than their absolute and relative volumes might otherwise indicate. While non-subject import market share grew, the primary negative impact on the domestic industry was due to lower prices, and on this point, subject imports, themselves, were large enough and priced low enough to have a significant impact. This is so regardless of the adverse effects caused by non-subject imports.[182]

Given our findings about the significant volume of subject imports both absolutely and as a share of apparent domestic consumption and production, evidence of significant underselling and price depression by subject imports, and declines in nearly all of the domestic industry's performance indicators during a time of increasing apparent domestic consumption, we conclude that subject imports are having a significant adverse impact on the domestic industry producing DRAM products.

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[178] See, e.g., CR at VI-1 at n.4; PR at VI-1 at n.4; CR/PR at Table C-1; domestic producer questionnaire responses.

[179] See, e.g., CR at VI-1 at n.4; PR at VI-1 at n.4; CR/PR at Table C-1; domestic producer questionnaire responses and n.177 supra. Micron's credit rating was lowered in December 2002 by Standard and Poor's and in January 2003 by Moodys. See, e.g., Micron's Posthearing Brief, Exh. 2 at 29-30.

[180] Hynix claims that the U.S. DRAM industry is in better condition in the current downturn than it was during the previous downturn from 1996 to 1998. See, e.g., Hynix's Prehearing Brief at 26-47. We find a comparison of the current period to any particular period to be of limited value given that each period is likely to represent a unique combination of circumstances. For example, it would not be surprising if the industry were in some respects in a better position during the current period than in some prior downturns because 2000 was an exceptionally strong year for the industry. We have based our decision on the drastic deterioration in the industry's condition that occurred since 2000, and the role that subject imports played in that deterioration.

[181] See, e.g., Hearing Tr. at 98-99 (Kaplan, Appleton); CR at II-13; PR at II-8.

[182] Although not raised by Hynix, we have also considered the impact of the export performance of the domestic industry. The domestic industry exports a large and growing share of its DRAM products production, although it sells a substantial portion (the majority in each of the full years 2000 through 2002) in the U.S. market. Increasing export shipments offset to some degree the slower growth of the industry's domestic sales and thereby allowed the industry to utilize more capacity than it would otherwise have done. However, falling unit sales values on export sales had a negative impact on the domestic industry's profitability. The unit value of the industry's export shipments fell substantially, although somewhat less than the unit value of the industry's domestic sales. See, e.g., CR/PR at Table III-6. Thus, while the industry's export performance played a role in the injury it experienced, it does not sever the causal link between subject imports and material injury to the domestic industry.

CONCLUSION

For the reasons stated above, we determine that the domestic industry producing DRAM products is materially injured by reason of subject imports of DRAM products from Korea that Commerce found to be subsidized.

PART I: INTRODUCTION

BACKGROUND

This investigation results from a petition filed by Micron Technology, Inc. (Micron), Boise, ID, on November 1, 2002, alleging that an industry in the United States is materially injured and threatened with material injury by reason of subsidized imports of dynamic random access memory semiconductors (DRAMs) and DRAM modules from Korea. Information relating to the background of the investigation is provided below.[1]

Date	*Action*
November 1, 2002 ..	Petition filed with Commerce and the Commission; institution of Commission investigation (67 FR 68176, November 8, 2002)
November 27, 2002 .	Commerce's notice of initiation (67 FR 70927)
December 16, 2002 .	Commission's preliminary determination (67 FR 79148, December 27, 2002)
April 7, 2003	Commerce's preliminary determination (68 FR 16766); scheduling of final phase of Commission investigation (68 FR 18671, April 16, 2003)
June 20, 2003	Commerce's final determination (68 FR 37122, June 23, 2003, as amended by 68 FR 44290, July 28, 2003)
June 24, 2003	Commission's hearing[2]
July 23, 2003	Commission's vote
August 4, 2003	Commission's determination sent to Commerce

PREVIOUS AND RELATED COMMISSION INVESTIGATIONS

The Commission has conducted a number of investigations concerning DRAMs. These included both Title VII (antidumping only) and unfair trade practices investigations.[3] In addition, the Commission conducted antidumping investigations concerning a similar product, static random access memory

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[1] The Commission's notice of scheduling, Commerce's notice of final determination, and Commerce's notice of amended final determination, as published in the *Federal Register*, are presented in app. A.

[2] A list of witnesses that appeared at the hearing is presented in app. B.

[3] See, *Dynamic Random Access Memory Semiconductors of One Megabit and Above from Taiwan* (Inv. No. 731-TA-811 (Final)), USITC Pub. 3256, December 1999; *DRAMs of One Megabit and Above from the Republic of Korea (Views on Remand)* (Inv. No. 731-TA-556 (Remand)), USITC Pub. 2997, October 1996; *DRAMs of One Megabit and Above from the Republic of Korea* (Inv. No. 731-TA-556 (Final)), USITC Pub. 2629, May 1993; *64K Dynamic Random Access Memory Components from Japan* (Inv. No. 731-TA-270 (Final)), USITC Pub. 1862, June 1986; and *Dynamic Random Access Memory Semiconductors of 256 Kilobits and Above from Japan* (Inv. No. 731-TA-300 (Preliminary)), USITC Pub. 1803, January 1986. The five-year review concerning *DRAMs of One Megabit and Above from the Republic of Korea* (Inv. No. 731-TA-556 (Review)) initiated in November 1999 was terminated by the Commission following Commerce's notification revoking the antidumping duty order (65 FR 59391, October 5, 2000). Also, see U.S. International Trade Commission Invs. Nos. 337-TA-421, 337-TA-414, 337-TA-345, 337-TA-312, and 337-TA-242.

semiconductors (SRAMs).[4] There are currently no outstanding antidumping duty orders on any of these products.

SUMMARY DATA

A summary of data collected in the investigation is presented in appendix C, table C-1.[5] Except as noted, U.S. industry data are based on questionnaire responses[6] of nine firms that accounted for the vast majority of U.S. fabrication of uncased DRAMs and assembly of cased DRAMs during January 2000-March 2003. U.S. imports are based on responses to Commission questionnaires because official import statistics do not adequately categorize separately the imports of subject product (see the sections on U.S. Tariff Treatment and U.S. Imports). Calculated as a percentage of the total value of imports from all countries, as reported in official Commerce statistics, the import data presented in this report account for 83.6 percent of cased DRAM imports in 2002.[7]

For the purposes of presentation in this report, "domestic" DRAMs consist of all uncased and cased DRAMs, as well as DRAM modules, that contain U.S.-fabricated dice, regardless of the location of final assembly/casing of the DRAM or manufacturing of the module. In addition, cased DRAMs assembled in the United States from third-country-sourced dice (i.e., dice not fabricated in the United States or Korea) and modules therefrom are also included as "domestic" products.[8] The "subject" Korean product consists of all uncased and cased DRAMs, as well as DRAM modules, that contain non-Samsung Korean-fabricated dice, regardless of the location of final cased DRAM assembly or module manufacture.

NATURE AND EXTENT OF SUBSIDIES

On June 20, 2003, Commerce notified the Commission of its final determination that countervailable subsidies are being provided to certain producers and exporters of DRAMs from Korea.

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[4] See, *Static Random Access Memory Semiconductors from Taiwan (Views on Remand)* (Inv. No. 731-TA-762 (Second Remand)), USITC Pub. 3319, June 2000; *Static Random Access Memory Semiconductors from Taiwan (Views on Remand)* (Inv. No. 731-TA-762 (Remand)), USITC Pub. 3230, September 1999; and *Static Random Access Memory Semiconductors from the Republic of Korea and Taiwan* (Invs. Nos. 731-TA-761-762 (Final)), USITC Pub. 3098, April 1998.

[5] Because Micron has argued that Hynix should be excluded as a related party, and Hynix has argued that its shipment data should be examined separately, summary data presenting the domestic industry data without Hynix and presenting shipments by Hynix (HSA) separate from other shipments is presented in appendix C, table C-2. Hearing transcript, pp. 104-105 and 235-236.

[6] All references to questionnaires in this report are to questionnaires received in the final phase of this investigation, unless otherwise specified.

[7] The Harmonized Tariff Schedule of the United States (HTS) statistical categories applicable to uncased DRAMs and DRAM modules also include nonsubject products (see the section on U.S. Tariff Treatment).

[8] The "domestic" product also includes Samsung Korean-fabricated dice that are cased in the United States; ***.

Countervailable Programs

Direction of Credit and Other Financial Assistance

Commerce determined that the Government of Korea directed credit to the Korean semiconductor industry through 1998 and specifically to Hynix and companies that continue to be, or were part of, the Hyundia Group from 1999 through June 30, 2002. Specific financial contributions made pursuant to the Government of Korea's direction of credit include loans, convertible bonds, extensions of maturities (which Commerce viewed as new loans), D/A financing, usance financing, overdraft lines, debt forgiveness, and debt-for-equity swaps that Commerce determined were direct transfers of funds from the government-directed financial institutions. Commerce calculated the benefit from all of the financial contributions and divided the total benefit by each respective company's total sales value during the period of investigation. On that basis, Commerce determined the net countervailable subsidy from the financial contributions to be 44.07 percent *ad valorem*, as revised, for Hynix and 0.01 percent *ad valorem* for Samsung.[9]

Operation G-7/HAN Program

Under the Framework Act on Science and Technology, the Government of Korea made direct financial contributions in the form of interest-free loans to respondent companies under the Operation G-7/HAN Program. Both Hynix and Samsung reported that they had loans that were outstanding during Commerce's period of investigation under this program. Commerce determined that this program is specific because it is limited to the semiconductor industry, that a financial contribution was provided in the form of direct loans from the Government of Korea, and that countervailable benefits of 0.22 percent *ad valorem* and 0.03 percent *ad valorem* exist for Hynix and Samsung, respectively.

21st Century Frontier R&D Program

The 21st Century Frontier R&D program is a program established by the Government of Korea in 1999 that provides loans under the project area entitled "Tera-Level Nano-Devices Development Program" (TND) to semiconductor manufacturers in the form of matching funds to promote greater competitiveness in science and technology. The TND program began in 2000 and will end in June 2010. The Government of Korea made direct financial contributions under this program in the form of long-term interest-free loans through certain administrative authorities. Hynix reported that it had loans outstanding under this program during Commerce's period of investigation. Although Samsung did not report any TND loans, evidence on Commerce's record indicates otherwise. Commerce determined that

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[9] The original calculated subsidy for Hynix was 44.48 percent *ad valorem*. Commerce determined that the bonds that were placed in the Collaterized Bond Obligation and Collaterized Loan Obligation funds as part of the KDB "Fast Track" Debenture program did not provide a countervailable subsidy to Hynix because those programs were available to anyone with maturing bonds that wanted to participate and Commerce found no evidence of specificity in the application of the program. In addition, Commerce did not include the following loans in its benefit calculations because it determined that these loans were for projects involving nonsubject merchandise: (1) Hynix's Long-Term Usance loans and loans under the Fund for Promotion of Informatization and the Fund for Promotion of Defense Industry, (2) Samsung's loans under the Science and Technology Promotion Fund prior to 1999, and (3) Hynix's and Samsung's loans from the Fund for Promotion of Informatization and the Fund for Industrial Technology Development. Commerce also determined that the lending and credit practices of Citibank are not directed by the Government of Korea.

a financial contribution was provided in the form of direct loans from the Government of Korea and that the TND program is specific because it is limited to Hynix, Samsung, and various government research institutes. A countervailable benefit of 0.00 percent *ad valorem* for Hynix was found by Commerce.[10] Commerce also determined that the 21st Century Initiative did not provide a subsidy in the form of a governmental provision of a good or service.

Other Programs

In its final determination, Commerce found that the following programs are not countervailable:

A. Tax Programs Under the Tax Reduction and Exemption Control Act (TERCL) and/or the Restriction of Special Taxation Act (RSTA)
   1. Tax Credit for Research and Human Resources Development Expenses (Article 10 of RSTA/Article 9 of TERCL)
   2. Temporary Tax Credit for Investment (Article 26 of RSTA/formerly Article 27 of TERCL)
B. Import Duty Reduction for Cutting Edge Products
C. Permission for Hynix and Samsung to Build in Restricted Area
D. Exemption of Value Added Tax on Imports Used for Bonded Factories under Construction
E. Energy Savings Fund Program

Commerce also determined that the Won 680 Billion Bond Guarantee program does not exist and that no responding companies applied for or received benefits under the following programs:

A. Short-Term Export Financing
B. Tax Programs Under the TERCL and/or the RSTA
   1. Reserve for Research and Human Resources Development (formerly Technological Development Reserve) (Article 9 of RSTA/formerly, Article 8 of TERCL)
   2. Tax Credit for Investment in Facilities for Productivity Enhancement (Article 24 of RSTA/Article 25 of TERCL)
   3. Tax Credit for investment in Facilities for Special Purposes (Article 25 of RSTA)
   4. Reserve for Overseas Market Development (formerly, Article 17 of TERCL)
   5. Reserve for Export Loss (formerly, Article 16 of TERCL)
   6. Tax Exemption for Foreign Technicians (Article 18 of RSTA)
   7. Reduction of Tax Regarding the Movement of a Factory That Has Been Operated for More Than Five Years (Article 71 of RSTA)
C. Tax Reductions of Exemption on Foreign Investments under Article 9 of the Foreign Investment Promotion Act (FIPA)/FIPA (formerly Foreign Capital Inducement Law)
D. Duty Drawback on Non-Physically Incorporated Items and Excessive Loss Rates
E. Export Insurance
F. Electricity Discounts Under the RLA Program

[10] For Samsung, Commerce was not able to determine whether funds received under the TND Program were tied to nonsubject merchandise, as claimed by Samsung. Regardless, Commerce found that even if the amounts received by Samsung were not tied to nonsubject merchandise, any benefit to the company would be insignificant. Therefore, Commerce found no countervailable benefit to Samsung under the TND Program.

Commerce's Final Estimated Net Countervailable Subsidy Rates

Commerce's final determination, as revised, concerning the total estimated net countervailable subsidy rates for Korean producers/exporters of the subject merchandise is summarized in the following tabulation:

Producer/exporter	Net subsidy rate (*percent*)
Samsung Electronics Co., Ltd.	0.04 (*de minimis*)
Hynix Semiconductor Inc. (formerly, Hyundai Electronics Industries Co., Ltd.)	44.29
All others	44.29

U.S. TARIFF TREATMENT

For tariff and marking purposes, the Bureau of Customs and Border Protection (Customs) policy is that the country of origin of imported DRAMs is the location of assembly rather than the location of wafer fabrication. Mounting (also referred to as packaging, assembly, or casing) of integrated circuit chips is considered to be a substantial transformation conferring origin for both tariff and marking purposes. Various bases for determining the origin of goods of heading 8542 of the HTS are set forth in Customs regulations at 19 CFR § 102.20 based on the types and location of processing done for each import shipment; they include the mounting of the chip, dice, or wafer and the programming of the chip. Because these rules differ from the basis Commerce specified for identifying subject merchandise in this investigation (wafer fabrication), questionnaire responses are used in this report for import statistics rather than official statistics of Commerce.

Imports of DRAM wafers and uncut and cut dice are classified in HTS subheading 8542.21.80. Unmounted silicon chips, dice, and wafers (including DRAMs but also nonsubject products such as SRAMs and logic devices) are reported under statistical category 8542.21.8005.[11] Imports of assembled or cased DRAMs are reported under statistical categories 8542.21.8021 through 8542.21.8029.[12] Imports of memory modules (including DRAM modules but also nonsubject modules) are reported under statistical category 8473.30.1040.[13] Imports of motherboards are currently reported under statistical category 8471.50.0085. The normal trade relations tariff rate, applicable to imports from Korea, for all relevant subheadings is "free."

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[11] Prior to 2002, DRAM wafers and uncut and cut dice were classified in subheading 8542.13.80 (statistical reporting number 8542.13.8005).

[12] Prior to 2002, assembled or cased DRAMs were classified in subheading 8542.13.80. During 2000, the statistical reporting numbers for DRAMs were 8542.13.8021 through 8542.13.8034. For 2001, the statistical reporting numbers were 8542.13.8012 through 8542.13.8032.

[13] Prior to January 1, 2001, memory modules were included in a basket category for printed circuit assemblies. In 2001, the first year for which separate data are available for memory modules, these products accounted for 27 percent of the printed circuit assemblies. However, as mentioned, these modules also include non-DRAM products.

THE PRODUCT

In the "Scope of Investigation" section of its notice of final determination, Commerce stated that--

> *[t]he products covered by this investigation are dynamic random access memory semiconductors (DRAMs) from Korea, whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut die, and cut die. Processed wafers fabricated in Korea, but assembled into finished semiconductors outside Korea are also included in the scope. Processed wafers fabricated outside Korea and assembled into finished semiconductors in Korea are not included in the scope.*
>
> *The scope of this investigation additionally includes memory modules containing DRAMs from Korea. A memory module is a collection of DRAMs, the sole function of which is memory. Memory modules include single in-line processing modules, single in-line memory modules, dual in-line memory modules, small outline dual in-line memory modules, Rambus in-line memory modules, and memory cards or other collections of DRAMs, whether unmounted or mounted on a circuit board. Modules that contain other parts that are needed to support the function of memory are covered. Only those modules that contain additional items which alter the function of the module to something other than memory, such as video graphics adapter boards and cards, are not included in the scope. This investigation also covers future DRAM module types.*
>
> *The scope of this investigation additionally includes, but is not limited to, video random access memory and synchronous graphics random access memory, as well as various types of DRAMs, including fast page-mode, extended data-out, burst extended data-out, synchronous dynamic RAM , Rambus DRAM and Double Data Rate DRAM. The scope also includes any future density, packaging, or assembling of DRAMs. Also included in the scope of this investigation are removable memory modules placed on motherboards, with or without a central processing unit, unless the importer of the motherboards certifies with the U.S. Bureau of Customs and Border Protection (Customs) that neither it, nor a party related to it or under contract to it, will remove the modules from the motherboards after importation. The scope of this investigation does not include DRAMS or memory modules that are re-imported for repair or replacement.*
>
> *The DRAMs subject to this investigation are currently classifiable under subheadings 8542.21.8005 and 8542.21.8021 through 8542.21.8029 of the Harmonized Tariff Schedule of the United States (HTSUS). The memory modules containing DRAMs from Korea, described above, are currently classifiable under subheadings 8473.30.10.40 or 8473.30.10.80 of the HTSUS. Although the HTSUS subheadings are provided for convenience and customs purposes, the Department's written description of the scope of this investigation remains dispositive.*

Like Product Issues

In the preliminary phase of the investigation, the Commission found "a single domestic like product consisting of all DRAM products regardless of density, including cased or uncased DRAMs as well as DRAMs packaged into memory modules, and including all DRAM product types...."[14]

Physical Characteristics and Uses

DRAM is a class of volatile semiconductor memory that allows data to be both read from and written to the device's storage locations in a non-linear fashion. DRAMs use a memory or storage cell structure based on a transistor and capacitor combination in which digital information is represented by a charge stored on each of the capacitors in the memory array. Storage requires two different levels of energy, one to represent the binary digit (bit) "0" and another to represent the binary digit "1." DRAM gets the name "dynamic" from the fact that the capacitors are imperfect and will lose their charge unless the charge is repeatedly replenished (refreshed) on a regular basis (every few milliseconds) by externally supplied signals.

Storage cells in DRAMs are arranged in a matrix of columns and rows allowing each cell to be accessed independently (random access) and in the same amount of time. When a column or row is selected and activated, the cell transistor acts as a solid-state switch that connects the capacitor to the column. The simultaneous selection of a row and column determines the specific cell address. The speed at which the cell can be addressed is called access time and is expressed in nanoseconds (ns), or one-billionths of a second.[15]

In the early 1970s, DRAM semiconductors (chips) with a density of 1,024 storage cells or bits per chip (1 kilobit or 1Kb) were introduced. Since then, improvements in semiconductor processing and circuit design have allowed for continued increases in density. Throughout the 1970s and 1980s, 4Kb, 16Kb, 64Kb, 256Kb, 1Mb,[16] and 4Mb DRAMs were introduced. During the 1990s through 2002, 16Mb, 64Mb, 128Mb, 256Mb, and 512Mb chips entered the market. In terms of value, 128Mb and 256Mb DRAMs currently account for the largest part of the market.[17]

Specifically mentioned in the scope of Commerce's preliminary determinations are several DRAM types, all of which use the basic DRAM storage cell structure. First, DRAMs with enhanced addressing modes have been specifically included, such as fast page mode (FPM), extended data out (EDO), burst extended data out (BEDO), synchronous DRAM (SDRAM), Rambus DRAM (RDRAM), and double data rate synchronous DRAM (DDR SDRAM). These DRAM products represent improvements over time in terms of the speed with which memory is able to be accessed, which affords better communication with ever advancing microprocessors.[18] In addition, certain specialty DRAM

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[14] *DRAMs and DRAM Modules from Korea*, Inv. No. 701-TA-431 (Preliminary), USITC Pub. 3569 at 6 (December 2002).

[15] McGraw-Hill Inc., "Semiconductor Memories" and "Computer Memory," *McGraw-Hill Multimedia Encyclopedia of Science and Technology* (U.S.A.: McGraw-Hill, 1996).

[16] A megabit (Mb) DRAM has a density of 1,048,576 bits per chip.

[17] IC Insights, *The McLean Report - An In-Depth Analysis and Forecast of the Integrated Circuit Industry* (Scottsdale, AZ: IC Insights, 2002), pp. 8-1 to 8-25.

[18] FPM is the oldest of these technologies and DDR SDRAM the newest. Generally, each of these products is considered to have been an improvement on its predecessors, and over time, the newer technologies replace the older technologies. Currently, DDR SDRAM is in the process of replacing SDRAM as the most widely used

(continued...)

products have been specifically included: video RAM (VRAM) and synchronous graphics RAM (SGRAM). VRAM and SGRAM are DRAM products that have been optimized for use in specific applications.[19]

Also included in the scope are DRAM modules.[20] DRAM modules generally consist of a printed circuit board containing two or more DRAMs as well as supporting components such as capacitors and logic devices.[21] In most applications, a module provides a packaging arrangement for DRAMs allowing for their attachment and interconnection with a computer's main circuit board. The most common types of DRAM modules are single in-line processing modules (SIPs), single in-line memory modules (SIMMs), dual in-line memory modules (DIMMs), small outline dual in-line memory modules (SODIMMs), memory cards, and memory boards.

DRAMs and DRAM modules are used as the main memory in a variety of electronic products including computers and computer peripherals, telecommunications equipment, networking equipment, and consumer electronics devices. By far, the largest end use for DRAMs and DRAM modules is computer equipment.[22]

Manufacturing Processes, Facilities, and Employees

The manufacture of DRAMs is a highly capital-intensive and automated process, and can be divided into three stages: design, fabrication, and assembly and test.[23] The design of the circuit layout for a DRAM often requires highly skilled technical employees, computer hardware, and computer-aided design software. During this process, the circuit patterns are transferred to glass photomasks, one for each layer of the DRAM. It is at the design stage that decisions are made relating to the essential characteristics and functions of the DRAMs.

The fabrication process is very automated and extremely capital intensive, with the cost of a new fabrication facility (and equipment) currently estimated at more than $2 billion.[24] DRAMs are produced on wafers of highly purified silicon, with 8 inches being the current standard diameter.[25] The process of fabricating DRAMs (or dice or chips) on a silicon wafer entails the use of photomasks and

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[18] (...continued)
product in the market.

[19] According to questionnaire responses, these products appear to account for a relatively small share of the overall DRAM market.

[20] Memory modules are usually measured in terms of bytes, rather than bits. There are eight bits in a byte. Therefore, a 32 megabyte DRAM module could potentially incorporate four 64-megabit DRAMs or sixteen 16-megabit DRAMs.

[21] DRAM modules may also contain other parts. If those other parts change the function of the module to something other than memory, such as video graphics adapter boards and cards, the modules are excluded from the scope of the investigation.

[22] Hearing transcript, pp. 84 and 228.

[23] This description of DRAM manufacturing draws upon the petition, pp. 6-7 and exh. 6.

[24] Conference transcript, pp. 61 and 76.

[25] Wafer preparation entails the chemical transformation of sand (silicon dioxide) into highly pure polysilicon and then into silicon wafers. U.S. DRAM fabricators purchase their silicon wafers from third parties. In the mid-1990s, the industry transitioned from 6-inch wafers to 8-inch wafers. The industry is currently beginning to move to the next wafer size, 12-inches. When a wafer is introduced into the production process it is referred to as a "wafer start." Wafer starts and potential wafer starts are often used as measures of production and capacity, respectively.

photolithographic and etching equipment to "expose" circuit patterns onto the surface of the wafer. Chemical impurities (dopants) are introduced to form conducting and non-conducting regions on the wafer by changing the electrical characteristics of certain areas. The wafers are cleaned, deposition equipment is used to build up additional surface layers, and the process begins again. A completed DRAM chip typically will have multiple layers. Metal connections between selected regions of each die are formed and a final protective coating is applied to the wafer. The fabrication process often takes about 2-3 months to complete.[26] It is in the wafer fabrication stage that the electrical and technical characteristics of the individual dice are developed. Depending on the diameter of the wafer and the size of the individual dice, hundreds of identical DRAM dice may be produced simultaneously. At the close of the fabrication stage, a wafer-probe test is performed, electrically testing each die on the wafer and marking defective dice for rejection.

After the fabrication stage, the DRAMs are assembled (or cased) and further tested.[27] Assembly includes back grinding the wafer to the desired thickness, separation of the wafer into individual chips, curing the chips by exposing them to ultraviolet light, wire bonding metal lead frames to the chips, solder plating the metal leads, trimming and forming the leads into a desired shape, and encapsulating the chips (usually in plastic).[28] After assembly, chips are given final tests to ensure quality and reliability and are marked for identification purposes. Although test and assembly is quite automated, it is relatively labor intensive compared with fabrication and may be conducted in a lower labor-cost third country.[29]

The manufacturing process for DRAMs of different densities or addressing modes, as well as that for specialty DRAMs (such as VRAM and SGRAM), is essentially the same. Producing different types of DRAMs requires the use of a different mask set during wafer fabrication, but otherwise the same equipment, processes, and production workers are utilized.[30] *** manufactures non-DRAM products using the same equipment and workers used to manufacture DRAMs.[31]

DRAMs are basically a commodity product. As such, in the DRAM industry it is important to maximize the number of good chips produced per wafer. The higher the number of good DRAMs per wafer, the lower the price that the company can feasibly charge. One way of raising the number of good dice per wafer (the wafer yield) is through improvements in processing to reduce the percentage of defective dice. Wafer yields generally are low at the introduction of a new density generation and

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[26] According to the respondents, 60-80 days are required to fabricate DRAMs. Conference transcript, p. 77.

[27] According to the respondents, the cost of an assembly facility is approximately $300 million. Powerpoint presentation submitted by respondents, November 22, 2002. The respondents estimate that 85 percent of the value added in DRAM production occurs in the fabrication stage and 15 percent in assembly and test. Joint postconference brief of Hynix and Samsung, exh. 1 and exh. 2, pp. 4-5. The petitioner states that at the beginning of a product's life cycle, 80-90 percent of the cost of production is accounted for by fabrication, but that ultimately, fabrication declines to account for only 30-40 percent. Conference transcript, p. 60. ***. Domestic producer questionnaires of Infineon, Micron, and Samsung, II-19.

[28] This description of DRAM manufacturing draws upon the petition, pp. 6-7 and exh. 6. Also, see e-mail from ***, January 20, 1998.

[29] This delineation of the manufacturing process is referred to as production sharing. For a more detailed explanation of production sharing in semiconductors, see *Production Sharing: Use of U.S. Components and Materials in Foreign Assembly Operations, 1994-1997* (Inv. No. 332-237), USITC Pub. 3146, December 1998, pp. 3-14 to 3-18, and *Industry Trade & Technology Review*, USITC Pub. 3534, July 2002, pp. 34-36.

[30] The DRAM production process is essentially similar for domestic, subject Korean, and nonsubject foreign manufacturers. All DRAM producers use silicon wafers as the basic raw material and utilize similar photolithographic, diffusion, and etching equipment.

[31] ***. Domestic producer questionnaire of ***, p. 4.

improve over its lifetime. Producers also strive to condense the manufacturing cycle time by reducing the number of production steps.

There is also a constant effort by producers to generate "die shrinks." A die shrink is a process that results in smaller chip or die sizes. By developing smaller dice, producers are able to fabricate more dice on a given wafer. With the relatively constant cost of processing a wafer, regardless of the number of dice, reducing die size allows for reduced per-unit production costs and increased competitiveness. Die shrinks are often achieved by improving designs for use on existing equipment, by purchasing and utilizing newer equipment capable of producing smaller device sizes, or a combination of the two. As a result of the drive to achieve die shrinks, fabrication facilities are in a constant state of having to upgrade their equipment to remain competitive.

Module assembly basically entails placing cased DRAMs onto a small printed circuit board (PCB).[32] An adhesive is placed on the PCB and then an automated pick and place machine selects the appropriate DRAMs (plus associated logic components and capacitors as required) and positions them in the correct locations on the PCB. The PCB is placed in a reflow oven, which causes the solder on the leads of the components to adhere to the PCB. The modules are then cleaned and tested.[33]

Interchangeability

Questionnaire responses indicated that there is no other product that is generally interchangeable with DRAMs. Within the DRAM product family, DRAMs of similar density, access speed, and variety (regular DRAM, VRAM, SGRAM, etc.) are generally interchangeable regardless of the origin of fabrication.[34] For example, a 64Mb SDRAM manufactured by a Korean producer should be fully interchangeable with a similarly configured domestically produced device, as well as with a nonsubject import.[35] Substitutability also exists between similarly configured DRAMs of different density, but to a more limited degree.[36] For example, with regard to their use in a memory module, two 64Mb SDRAMs should be interchangeable with one 128Mb SDRAM. In addition, though perhaps less common, a limited degree of interchangeability appears to exist among different varieties of DRAMs as well as among those with different addressing modes/access speeds. However, it appears that this substitution often must occur during the design of the electronic system. For example, according to numerous questionnaire responses, after an electronic system has been designed to operate using a specific type of DRAM, the system would likely not function optimally using a different type. Similarly, with regard to the different addressing modes, once a memory controller has been designed for an electronic system, a specific addressing mode such as EDO or SDRAM has also been designed in.

Producer and Customer Perceptions

Questionnaire responses of domestic producers, importers, and purchasers indicate that there is little perceived difference in product characteristics or sales conditions between similarly configured domestically produced DRAMs, subject imports, and nonsubject imports. The petitioner claims that

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[32] ***. Domestic producer questionnaires of Infineon, Micron, and Samsung, II-20.

[33] This description of DRAM module manufacturing draws upon the petition, pp. 6-7 and exh. 6.

[34] Questionnaire responses.

[35] Various questionnaire responses. In their joint postconference brief, p. 13, respondents state that commodity DRAMs are readily substitutable regardless of country of origin.

[36] Practical interchangeability often occurs between DRAMs one density generation removed (e.g., 64Mb chips for 128Mb chips, or 128Mb chips for 256Mb chips).

DRAMs are commodity products sold on the basis of price alone, and that Korean DRAMs are equivalent to its own in terms of performance.[37]

Hynix argues that ***. ***.[38]

Channels of Distribution

DRAMs are sold under contract and in the spot market as well as in direct sales to PC OEMs, other OEMs, and through distributors. The petitioner and respondent Hynix agree that the vast majority of sales of both domestic products and subject imports are to large, multinational computer equipment manufacturers. The petitioner and respondent Hynix estimated that 85 percent and 75 percent, respectively, of DRAM consumption is accounted for by the computer equipment industry.[39] The petitioner and respondent Hynix both sell to distributors; however, these sales reportedly account for a very small share of the market.[40] For further information concerning channels of distribution, see the section in Part II of this report entitled "U.S. Market Segments/Channels of Distribution."

Price

DRAMS are considered commodity products and compete largely on the basis of price. The DRAM industry is highly cyclical, with short product-life cycles. In the short term, prices may differ for technologically advanced or specialty DRAMs, which begin their life cycles as high-margin products. However, as products exit the introductory phase of their cycle and an increasing number of suppliers join the market, DRAMs are rapidly transformed into commodity goods. Largely because of the perpetual improvements in production efficiencies experienced by this industry, prices are usually in a near constant decline. According to the petitioner, over the long term, there has been about a 20 percent to 30 percent decline in the price of DRAMs on an annual basis.[41] During the period examined in this final phase investigation, the unit value of DRAMs sold in the U.S. market (on a per billion bit basis) has declined from $118 in 2000 to $25 in 2002 and $18 in January-March 2003.

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[37] Conference transcript, p. 16.

[38] Importer questionnaire of Hynix, III-B-22.

[39] Hearing transcript, pp. 84 and 228. See also Micron's posthearing brief responding to Chairman Okun's questions for public data on this point.

[40] Conference transcript, pp. 68-69 and 128.

[41] Hearing transcript, p. 125.

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

U.S. MARKET SEGMENTS/CHANNELS OF DISTRIBUTION

Most DRAMs and DRAM modules are used in computers or peripheral computer equipment.[1] There are three primary channels of distribution for DRAMs and DRAM modules: major PC manufacturers (PC OEMs), manufacturers of other electronic equipment such as communications equipment, and purchasers other than OEMs. Many of these non-OEM customers are producers of memory or video modules, or contract electronics manufacturers. Major DRAM producers in the United States, Korea, and nonsubject countries compete in all three channels of distribution. There are also some sales through authorized electronics distributors, but it is believed that sales through distributors account for a small share of overall sales.

SUPPLY AND DEMAND CONSIDERATIONS

U.S. Supply

Domestic Production

Based on available information, U.S. DRAM producers are likely to respond to changes in demand with small changes in the quantity of shipments of U.S.-produced DRAMs and DRAM modules to the U.S. market. The main contributing factors to the low degree of responsiveness of supply are the lack of production alternatives and the capital-intensive nature of DRAM production that ensures that any DRAM fabrication facility will operate as close to maximum capacity as possible, tempered by the global nature of domestic DRAM producers.

Industry capacity

Fabrication capacity of domestic producers, in terms of wafers, declined 7.9 percent from 2000 to 2002, primarily due to domestic producers Fujitsu, IBM, and NECELAM phasing out DRAM production, and ***, and was 1.4 percent higher in the first quarter of 2003 compared to the first quarter of 2002. Capacity utilization was higher in 2002 than in 2000, and slightly lower in the first quarter of 2003 than in the first quarter of 2002. Because of changes in product mix and improved process technology, production in terms of bits was 39.4 percent higher in 2002 than in 2000, and was 62.1 percent higher in the first quarter of 2003 compared to the first quarter of 2002. Domestic producer Micron reported that its existing unused capacity could be utilized to produce DRAMs in the cycle time of a wafer fab, approximately 45 to 50 days, and that fabrication capacity could be increased further, with the addition of equipment to its Dominion and Lehi facilities, in 4 to 6 months.[2]

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[1] Conference transcript, p. 68, Mr. Sadler; hearing transcript, p. 84, Mr. Appleton; and Hynix's posthearing brief, exh. 1, p. 1.

[2] Conference transcript, pp. 43-44, Mr. Appleton.

Alternative markets

Current domestic producers are all global companies with facilities in multiple countries. Micron has fabrication facilities in Italy and Japan as well as in the United States, and a *** percent interest in a fabrication facility in Singapore. Micron has test and casing facilities in Singapore, and module assembly operations in Singapore and in Scotland, as well as in the United States. Infineon Technologies Richmond is affiliated with Infineon Technologies AG of Germany, which has other affiliated facilities producing DRAMs and DRAM modules in Germany, Portugal, and Malaysia, and a joint venture in Taiwan. Domestic producers Hynix Semiconductor Manufacturing America (HSMA) and Samsung Austin Semiconductor (SAS) are affiliated with Korean producers Hynix and Samsung, respectively.

The major purchasers of DRAMs and DRAM modules are multinational computer equipment manufacturers that source DRAMs and DRAM modules globally. Responding purchasers with locations both within and outside the United States, that reported negotiating globally for all locations include ***.[3] The commodity nature of standard DRAMs and the low transportation costs involved mean that DRAMs and DRAM modules can easily be shifted from one customer location to another, or purchases shifted from one source to another. In response to questions on pricing (see Part V), *** reported U.S. sales of DRAMs and DRAM modules fabricated in the United States as well as products fabricated outside the United States. Domestic producers HSMA and SAS fabricate DRAMs in the United States, but send all of their product to Korea to be tested and cased. Domestic producer ***. The major DRAM producers can and do shift DRAMs to and from alternative markets.[4]

Inventory levels

End-of-period inventory levels of uncased dice were low throughout the period examined--not more than *** percent of total shipments in any year or interim period. End-of-period inventories of cased dice fell *** from *** percent of total shipments in 2000 to *** percent of total shipments in 2002, and were lower for the first quarter of 2003 compared to the first quarter of 2002. Inventory levels of modules as a ratio to total shipments was *** lower in 2002 compared to 2000, and lower at the end of the first quarter of 2003 compared to the first quarter of 2002.

Production alternatives

Domestic producers have limited ability to shift production capacity to or from alternate products. Domestic producer *** reported that the share of total wafer fabrication capacity devoted to

[3] Hynix's prehearing brief, p. 20, lists 10 multinational firms which respondents believe account for the vast majority of U.S. purchases of DRAMs and DRAM modules. Nine of these firms are reported to be among the top 10 customers of at least one of the four domestic producers of DRAMs (the importer questionnaire responses of HSA and SSI were used to determine the major customers of domestic producers HSMA and SAS), and three were among the top 10 customers of all four domestic producers. See additionally, hearing transcript, pp. 239-240, Mr. Swanson.

[4] Domestic producer *** apparently shifted product *** from *** market to alternate markets from 2000 to 2002. In 2000, U.S. commercial shipments by *** of DRAM products fabricated *** accounted for *** percent of all DRAMs *** in that year. In 2002, U.S. commercial shipments by *** of DRAM products fabricated *** accounted for *** percent of all DRAMs ***.

DRAMs has been *** percent since 2000, and was *** percent in interim 2003.[5] Domestic producers ***.

Subject Imports

Based on available information, the producers of subject Korean DRAMs and DRAM modules are likely to respond to changes in demand with moderate changes in the quantity of shipments of DRAMs and DRAM modules to the U.S. market. The main contributing factors to the relatively low degree of responsiveness of supply are the lack of sufficient alternative markets, the inability to produce alternate products, and the very capital-intensive nature of DRAM production.

Industry capacity

Fabrication capacity of Hynix, the only subject Korean DRAM fabricator, in terms of wafers, decreased *** percent from 2000 to 2002, and was *** percent lower in the first quarter of 2003 compared to the first quarter of 2002. Capacity utilization was *** higher in 2002 compared to 2000, and Hynix reported operating at *** capacity utilization during ***. Because of changes in product mix, and improvements in process technology, total production in terms of uncased DRAM bits increased *** percent from 2000 to 2002, and was *** percent higher in the first quarter of 2003 compared to the first quarter of 2002.

Alternative markets

The United States is the single largest market for DRAMs. IC Insights, Inc. reports that the Americas region accounted for *** percent of DRAM consumption in 2001.[6] Exports from Korea to the United States accounted for *** percent of all exports and *** percent of all shipments of subject Korean DRAMs and DRAM modules by Hynix on a bit basis in 2002.

Korean producer Hynix is affiliated with domestic producer HSMA. HSMA ships all of its uncased DRAMs to Korea to be tested and cased. Some of the capacity of HSMA could be shifted from sales in alternative markets to the United States. However, this ability is limited. Total imports of subject DRAMs and DRAM modules *** replaced by domestic product fabricated in the United States and cased in Korea, as the production capacity in Korea devoted to exports to the U.S. market *** of HSMA.[7] Further, it would not be economical for a single fabrication facility to produce the broad product range required by purchasers.

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[5] *** produces *** using the same equipment used in the production of DRAMs. *** notes that the ability to shift capacity to these products ***.

[6] *IC Insights 2002*, IC Insights, Inc., p. 8-9. The Americas region includes North and South America.

[7] Production of uncased DRAMs by HSMA in 2002 was equivalent to *** percent of U.S. apparent consumption of DRAMs and DRAM modules in that year, and subject imports market share was *** percent.

Inventory levels

Subject Korean producer Hynix's inventories of DRAMs and DRAM modules as a share of all shipments declined from 2000 to 2002 and were a smaller share of total shipments in interim 2003 than in interim 2002, on a bit basis. End-of-period inventories of uncased DRAMs as a share of total shipments, which peaked in 2001 and were *** higher in 2002 than in 2000, never exceeded *** percent.

Production alternatives

Sales of DRAMs and DRAM modules accounted for *** percent of sales by Hynix in its most recent fiscal year. Other products produced on the same equipment as DRAMs and DRAM modules accounted for *** percent of sales. In 2002, DRAMs accounted for *** percent of wafer starts by Hynix. Hynix noted that ***.

U.S. Demand

Demand Characteristics

Historically, the DRAM market has been characterized by periods of "boom and bust." Importer *** attributes this cycle to the time lags involved in adding new capacity, and notes that a full cycle usually lasts about 4 years.[8] Domestic producer *** notes that historically, three years of positive growth were followed by one year of losses, but that more recently, periods of loss have been lengthening and periods of growth growing shorter.

Domestic producer ***, importers ***, and five responding purchasers reported that demand for DRAMs and DRAM modules had increased since January 2000, at least in terms of bits consumed. Causes noted were an increase in PC sales, increasing memory requirements per computer, and the increase in other digital equipment. Importers *** and six responding purchasers reported that demand for DRAMs and DRAM modules has declined. Factors reported were declining PC sales, a slump in the telecommunications and network industry, and a general recession. Based on data gathered in the final phase of this investigation, U.S. apparent consumption in terms of bits increased 89.2 percent from 2000 to 2002, and was 29.1 percent higher in the first quarter of 2003 compared to the first quarter of 2002. The value of U.S. apparent consumption declined 60.7 percent from 2000 to 2002 and was 27.7 percent lower in the first quarter of 2003 compared to the first quarter of 2002.

Substitute Products

Domestic producers and most responding purchasers reported that there are no viable substitutes for DRAMs and DRAM modules. Domestic producer *** reported that "There are no effective substitutes for DRAM. SRAM is too expensive, and flash is too slow." One importer, ***, reported that flash memory is a substitute for DRAMs in applications such as digital cameras.[9] Other importers were generally in agreement that there is no viable substitute for DRAMs and DRAM modules. Purchaser ***

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[8] Reply to Commission importer questionnaire.

[9] Response to Commission importer questionnaire in the preliminary phase of this investigation. Not all importers responded to Commission questionnaires in both the preliminary and final phases and responses were aggregated where possible.

also reported that flash products may be substituted for DRAMs and DRAM modules in some applications.

Cost Share

Responding domestic producers and importers report that cased DRAMs account for 85 to 95 percent of the cost of DRAM modules. Responding domestic producers and importers reported that DRAMs and DRAM modules account for a small share of the overall cost of most electronic equipment. Computers and computer peripheral equipment accounts for most consumption of DRAMs. Reportedly, DRAMs and DRAM modules account for 3 to 15 percent of the cost of a PC or laptop, and a slightly higher share of the total cost of a server. *** reported that DRAMs and DRAM modules account for 15-17 percent, 4-40 percent, and 10-20 percent of the total cost of a server, respectively. Purchasers *** reported that DRAMs and DRAM modules account for approximately 11 percent, 8-10 percent, and 35 percent of the total cost of a server, respectively. Other reported uses for DRAMs and the share of DRAM cost in total cost were game consoles, 10-20 percent; network equipment, less than 1 percent; graphics cards, 13-15 percent; and digital equipment such as PDAs and DVD players, 1-2 percent.

SUBSTITUTABILITY ISSUES

The degree of substitution between domestic and imported DRAMs and DRAM modules depends upon such factors as relative prices, quality (e.g., 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 a high degree of substitutability between the domestic and subject product. Both domestic producers and importers of the subject product sell a substantial share of DRAMs and DRAM modules for the same uses, and to the same customers. As Michael W. Sadler, Vice-President, Worldwide Sales, for Micron testified, "The vast majority of Micron's competitors, including specifically Samsung and Hynix from Korea, manufacture DRAMs that are equivalent in performance to our own."[10]

Some purchasers of DRAMs and DRAM modules, particularly major PC OEMs, purchase products under contracts from multiple sources, including most if not all of the major producers of DRAMs. Prices are negotiated and purchase shares allocated for fairly short periods of time, often two weeks. This practice protects the purchasers from possible disruptions in supply from any one source. It also keeps purchasers aware of the prices offered by multiple vendors, and through feedback from purchasers, keeps producers aware of competitors' prices.[11]

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[10] Conference transcript, p. 16.

[11] Domestic producer Infineon noted in its prehearing brief that practices it referred to as most-favored-customer (MFC) clauses and blended scaling could magnify the price impact of a low-priced competitor, even if the volume supplied by this competitor was relatively low. PC OEMs contacted by staff confirm the existence of pricing practices in which the lowest price in the market has an impact on other prices. Some purchasers have formal MFC and best-price clauses; others have less formal arrangements. Purchasers contacted by staff reported no formal arrangements equivalent to "blending" or "scaling," however, purchasers noted that similar prices would necessarily be paid for similar devices if the market would not support a price premium for one over the other. For instance, a premium might be paid for a faster speed, or for a SO-DIMM over a DIMM, for two or three quarters after a new device is introduced, but beyond some point, the market will no longer support a premium.

It is unclear that producers and importers of DRAMs and DRAM modules are able to distinguish products by source of fabrication. Only 10 of 17 responding producers and importers reportedly always know the country of fabrication for purchases and internal transfers of cased DRAMs, and 12 of 19 always know the country of fabrication of dice incorporated into modules that are purchased or internally transferred.[12] Only 8 of 24 responding purchasers reportedly always know the country of fabrication for their purchases of DRAMs and DRAM modules.

Factors Affecting Purchasing Decisions

The petitioner, Micron, has characterized DRAMs and DRAM modules as a commodity product, sold mainly on the basis of price.[13] Hynix noted that other factors such as technology, product range, the quality record, and delivery performance are also important factors for purchasers of DRAMs and DRAM modules.[14] Factors reported as most important by responding purchasers include quality/technology, price, and availability/delivery. See table II-1.

Table II-1
Ranking of factors in purchase decisions

Factor	Most important	Second most important	Third most important
	Number of firms reporting		
Quality/technology	9	10	3
Price	6	5	9
Availability/delivery	3	6	6
Traditional supplier	3	2	1
Other	4	2	4

Note.--Because of inconsistent reporting, figures do not add to number of responding purchasers.

Source: Compiled from responses to Commission questionnaires.

Comparisons of Domestic Products and Subject Imports

Most responding domestic producers and importers reported that DRAMs and DRAM modules are generally interchangeable, regardless of source. However, responding importers *** noted that there are differences in the product range supplied by different producers, and importer *** qualified its response that domestic products and subject imports are interchangeable by noting that they are interchangeable "if the DRAM is the same type." Importer *** reported that commodity DRAMs are interchangeable, but that other types of DRAMs are less interchangeable. Table II-2 summarizes the responses from producers and importers with regard to interchangeabilty and product differences by source.

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[12] ***.

[13] Conference transcript, p. 16, Mr. Sadler.

[14] Conference transcript, p. 81, Mr. Swanson.

Table II-2
Substitutability of DRAMs and DRAM modules from different sources

Item	Firms reporting "yes"	Firms reporting "no"
Are DRAMs and DRAM modules generally used interchangeably?		
Domestic vs subject	19	2
Domestic vs nonsubject	20	2
Subject vs nonsubject	19	2
Are there important differences in product characteristics or sales conditions?		
Domestic vs subject	1	22
Domestic vs nonsubject	2	22
Subject vs nonsubject	1	20

Note.--Responses are for all responding producers and importers of DRAMs and DRAM modules.

Source: Compiled from responses to Commission questionnaires.

Respondents agree that on the whole "commodity DRAMs are readily substitutable regardless of country of origin." Respondents argue, however, that the emergence of new technologies and devices that use DRAMs, along with the continuing requirement for legacy products, means that suppliers must maintain a wider variety of DRAMs, and that this has contributed to differences in product range.[15]

Hynix reportedly focuses more on specialty DRAMs, particularly graphics and legacy products than do Infineon and Micron. At the conference, respondents reported that HSMA has similar capabilities and production processes as the Hynix fabs in Korea, and any differences in product mix are generally short-lived.[16] In the postconference brief, respondents reported that HSMA produces a different product mix than that produced by the Hynix fabrication facilities in Korea, with more emphasis on the large-volume products.[17] Data collected in this investigation indicate that 128Mb and 256Mb dice accounted for *** percent of total uncased DRAM production by Hynix in 2002 on a bit basis, and 64Mb dice accounted for *** percent. Fabrication of 128Mb and 256Mb dice by domestic fabricators in 2002 accounted for *** percent of these firms' total production on a bit basis, and 64Mb dice accounted for *** percent. In the first quarter of 2003, fabrication of 128Mb and 256Mb dice accounted for *** percent of total fabrication by Hynix, and *** percent of fabrication by domestic producers. Table II-3 summarizes U.S. and subject Korean producers' share of reported production of uncased DRAMs by density product and by year.

Table II-3
U.S. and subject Korean producer's reported shares of fabrication, by density, 2000-2002, January-March 2002 and January-March 2003

* * * * * * *

[15] Respondents' postconference brief, pp. 13 and 18-19.

[16] Conference transcript, p. 125, Mr. Swanson.

[17] Respondents' postconference brief, p. 3.

Purchasers were asked to rate DRAMs and DRAM modules from each source as inferior, comparable to, or superior to those from each other source, for 14 factors. Few responding purchasers were able to report comparisons between DRAMs and DRAM modules from different countries. Many responding purchasers reported differences between DRAMs and DRAM modules from different firms, but were unable to determine the country of fabrication.

There are some reported differences in the range of products sold by domestic producers and importers of the subject product. Domestic producers *** reported that in 2002 all U.S. shipments of DRAMs and DRAM modules containing dice fabricated in the United States were of standard DRAMs. Eight of nine importers that reported sales in 2002 of DRAMs and DRAM modules containing dice fabricated in the United States, reported that all were standard products. Four of five importers that reported U.S. sales in 2002 of subject DRAMs and DRAM modules reported that all were standard products. Importer *** reported that Rambus DRAMs and DRAM modules accounted for *** percent of all U.S. shipments of DRAMs and DRAM modules containing dice fabricated in Korea.

There are reported differences between domestic producers and Hynix in terms of the line geometries utilized in fabrication facilities. Line geometry is a determinant of fabrication capacity in terms of bits. Hynix has lagged behind domestic producers in terms of upgrading fabrication facilities to smaller line geometries. The number of wafers processed at each line geometry by Hynix and by responding domestic producers in 2002 and interim 2003 is presented in table II-4. Total production in terms of bits per wafer would be expected to be much higher at smaller line geometries, for both Hynix and domestic producers.[18]

Table II-4
Number of wafers fabricated by Hynix and by domestic producers at each reported line geometry, 2002 and January-March 2003

* * * * * * *

Comparisons of Domestic Products and Nonsubject Imports

Responding producers and importers reported some differences in the product range of DRAMs and DRAM modules produced by nonsubject sources and sold in the U.S. market and those produced and sold domestically. All responding importers except *** reported that all U.S. sales in 2002 of DRAMs and DRAM modules containing dice fabricated in the United States were standard products. In contrast, only 8 of 15 responding importers with U.S. sales of nonsubject DRAMs and DRAM modules reported that 100 percent of their U.S. sales of nonsubject imports were standard products. Importers *** reported that Rambus DRAMs accounted for *** percent, respectively, of their U.S. sales of nonsubject imports in 2001. Importers *** reported that sales of specialty DRAMs and DRAM modules accounted for *** percent, respectively, of U.S. sales of nonsubject imports in 2002.

[18] For example, *** produced *** micron line geometry in the first quarter of 2002, whereas in the first quarter of 2003, *** produced *** micron line geometry. Therefore, in terms of bits per wafer, *** more than doubled capacity by moving from *** to *** micron line geometry. Actual production would also be a function of yield.

Comparisons of Subject Imports and Nonsubject Imports

As with other comparisons, responding producers and importers generally reported that DRAMs and DRAM modules from subject and nonsubject sources are interchangeable, with few differences in product characteristics or sales conditions.

ELASTICITY ESTIMATES

This section discusses the estimated supply, demand, and substitution elasticities used to estimate the impact of changes in the U.S. market price on domestic supply, nonsubject supply to the U.S. market, demand, and substitution between the domestic product and subject imports.

Domestic Supply

The domestic supply elasticity measures the sensitivity of the quantity supplied by U.S. producers to changes in the U.S. market price for DRAMs and DRAM modules. The elasticity of domestic supply depends on factors such as the level of excess capacity, the ease with which producers can alter capacity, the ability to shift production to alternate products, the existence of inventories, and the availability of alternate markets. Analysis of these factors suggests that the U.S. domestic industry has little ability to increase or decrease shipments to the U.S. market in response to a price change. The capital-intensive nature of DRAM fabrication dictates that a fabrication facility be operated at near full capacity. An estimate of 0.3 to 0.5 is suggested.

Subject Supply

The ability of foreign subject producers or exporters to respond to a change in the U.S. price of DRAMs and DRAM modules is enhanced by the existence of the foreign home market and alternate export markets. These alternate markets for the subject product increase the ability of subject producers to respond to price changes in the U.S. market by shifting sales to or from these alternate markets. The U.S. supply elasticity for subject sources is estimated to be in the range of 5 to 10.[19]

U.S. Demand

The U.S. demand elasticity measures the sensitivity of the overall quantity demanded to a change in the U.S. market price for the subject product. Demand elasticity depends on such factors as the existence, viability, and availability of substitute products, and the component share of DRAMs or DRAM modules in the total cost of electronic equipment. There are few viable substitutes for DRAMs and DRAM modules and DRAMs and DRAM modules account for a relatively small share of the total cost of a computer or most consumer electronics. A demand elasticity in the range of -0.3 to -0.7 is suggested.

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[19] Petitioner notes that the European Union has initiated an anti-subsidy proceeding concerning imports of DRAMs from Korea and has issued a provisional affirmative finding (hearing transcript, p. 63). An affirmative final determination would limit the ability of the subject producer to shift products from the U.S. market to the EU, and decrease the responsiveness of the subject producer to U.S. prices.

Substitution

The elasticity of substitution depends on the extent of product differentiation between the domestic and imported product. Product differentiation depends on factors such as quality and product range, and conditions of sale such as availability and delivery. Parties generally agree that commodity DRAMs are interchangeable. Domestic producers and subject imports generally focus on the same products sold to the same customers by domestic producers. The general interchangeability of DRAMs and DRAM modules from different sources might be somewhat attenuated by the desire of major customers to maintain a broad supplier base. Based on the available information, the elasticity of substitution between domestic and imported subject product is estimated to be in the range of 3 to 5.

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 volume and pricing of imports of the subject merchandise is presented in Parts IV and 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 that accounted for the vast majority of U.S. fabrication of uncased DRAMs and assembly of cased DRAMs from January 2000 through March 2003.

U.S. PRODUCERS

The Commission sent producer questionnaires to all firms believed to have produced or have been capable of producing DRAMs in the United States during any part of the period January 2000 through March 2003. According to questionnaire responses, during at least part of this period eight firms performed wafer fabrication in the United States, five firms performed DRAM assembly/casing, and two of the firms that both fabricate and case DRAMs also assembled DRAM modules domestically. Responding producers are believed to account for the vast majority of U.S. DRAM wafer fabrication and U.S. DRAM assembly, but only a portion of DRAM module assembly.[1]

Table III-1 presents a list of U.S. producers, with each company's position on the petition, U.S. production activities, production location, and the share of reported 2002 production of uncased and cased DRAMs.

Overview of U.S. Producers

Micron Technology

Micron Technology, Inc. (Micron), Boise, ID, the petitioner, performs DRAM wafer fabrication and assembly of DRAMs and DRAM modules at its headquarters in Boise, ID. Micron also fabricates DRAMs at a Manassas, VA, facility that it purchased in 2002 (see Micron Technology Virginia). The Boise site is currently capable of processing approximately *** DRAM wafers per month.[2] In addition to DRAMs, Micron also manufactures other semiconductor products, including SRAMs and flash memory. As a share of Micron's total wafer starts, DRAMs ranged from a low of *** percent in *** to a high of *** percent in ***. In 1995, Micron broke ground on a new fabrication, assembly, and test facility in Lehi, UT; however, the completion of the facility has been delayed and is dependent on market

[1] In the preliminary phase, as in previous investigations, the Commission has found that firms that only produce DRAM modules, without either fabricating or casing the DRAMs are not part of the domestic industry inasmuch as DRAM module packaging does not constitute sufficient production related activities. See, *DRAMs and DRAM Modules from Korea* (Inv. No. 701-TA-431 (Preliminary)), USITC Pub. 3569, December 2002, p. 8. On June 6, 2003, Commission staff learned that Kingston Technology Co., Inc. (Kingston), a domestic DRAM module assembler has a *** (Payton Technology Corp. (Payton)) that assembles (cases) DRAMs in the United States. Commission staff requested that Kingston/Payton provide a response to the Commission's producer questionnaire. Staff telephone interview and e-mail communication with *** of Kingston, June 6, 2003. The firm provided a questionnaire response concerning its domestic *** operations, but did not provide a response concerning its domestic *** operations.

[2] Domestic producer questionnaire of Micron, II-13, p. 7.

Table III-1
DRAMs and DRAM modules: U.S. producers, positions on the petition, U.S. production locations, shares of 2002 U.S. production (in bits) of uncased and cased DRAMs, and U.S. production activities during the period examined in this investigation

Firm name	Position on petition	U.S. production location	Share of U.S. production[1]		U.S. production activity[2]
			Uncased (*percent*)	Cased (*percent*)	
Dominion/MTV	Support	Manassas, VA	***	([3])	Fab
Fujitsu	***	Gresham, OR	([4])	([3])	Fab
Hynix	Oppose	Eugene, OR	***	([3])	Fab
IBM	***	Essex Junction, VT	([5])	([5])	Fab, A/T
Infineon	Support	Sandston, VA	***	***	Fab, A/T, Mod
Kingston/Payton	No position	Fountain Valley, CA	([6])	***	A/T, Mod[7]
Micron	Petitioner	Boise, ID	***	***	Fab, A/T, Mod
NECELAM	***	Roseville, CA	([8])	([8])	Fab, A/T
Samsung	Oppose[9]	Austin, TX	***	([3])	Fab

[1] Compiled from table III-4.
[2] "Fab" means wafer fabrication, "A/T" means DRAM assembly and testing, and "Mod" means module assembly.
[3] Not applicable. The firm did not case DRAMs in the United States during January 2000-March 2003.
[4] Fujitsu closed its domestic DRAM facility in 2001.
[5] IBM ceased all U.S.-DRAM fabrication in 2000 and completely exited the DRAM production business by mid-2001.
[6] Not applicable. The firm does not fabricate uncased DRAMs.
[7] Kingston/Payton cases DRAMs and assembles modules in its facilities in Fountain Valley, CA; however, the firm provided a producers' questionnaire for *** operations.
[8] NECELAM ceased DRAM production in 2001.
[9] Counsel for Samsung Austin testified in opposition to the petition at the Commission's conference in the preliminary phase of this investigation.

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

conditions. The Lehi facility is currently being used to perform test operations.[3] In addition to its U.S. facilities, Micron operates wholly owned wafer fabs in Italy and Japan, a joint venture fab in Singapore, an assembly and test facility in Singapore, and a module manufacturing plant in the United Kingdom.[4]

Micron Technology Virginia

Micron Technology Virginia (MTV), Manassas, VA, is a wholly owned Micron fabrication facility. Prior to April 2002, it was known as Dominion Semiconductor (Dominion).[5] At the beginning of the period examined, Dominion was a DRAM joint venture between Toshiba Corp. of Japan and

[3] Micron form 10-K, 2002, p. 9.

[4] Micron, "Corporate Profile," found at Internet address *www.micron.com*, retrieved November 25, 2002.

[5] Because Micron did not purchase Dominion's facility until the later part of the period examined, most references in this report are to Dominion rather than MTV. A separate questionnaire response was received in the preliminary phase of this investigation for Dominion covering the firm's operations until ***.

International Business Machines (IBM) of New York. In 2000, IBM sold its stake in the facility to Toshiba, and in 2002, Toshiba sold the entire facility to Micron. MTV fabricates DRAM wafers, but does not assemble DRAMs or DRAM modules.[6] The facility's capacity ***.[7] MTV's current production is limited to a ***. As a result, MTV is currently utilizing 5 percent of its production capability.[8] According to Micron, efforts to ***.[9] ***.

Fujitsu Microelectronics

Fujitsu Microelectronics America, Inc. (Fujitsu), San Jose, CA, is a subsidiary of Fujitsu Ltd. of Japan. Fujitsu fabricated DRAMs in its Gresham, OR, facility until its closure in 2001. The plant did not include DRAM assembly or module assembly operations.[10] In 1999, Fujitsu announced that it was withdrawing from the commodity DRAM business. This withdrawal was carried out ***.[11] Fujitsu planned to convert the DRAM production to flash memory production, but ultimately decided to sell the facility.[12] While still producing DRAMs, Fujitsu's DRAM wafer starts ***.[13] In 2002, the plant was sold to Microchip Technology, a non-DRAM semiconductor producer.[14]

Hynix Semiconductor Manufacturing America

Hynix Semiconductor Manufacturing America, Inc. (HSMA), Eugene, OR, is a subsidiary of Hynix Semiconductor America (HSA) of San Jose, CA. HSA in turn is a subsidiary of Hynix Semiconductor, Inc. (Hynix) of Korea. HSMA's production operations consist of *** DRAM wafer fab in Eugene, OR. The plant began production of DRAMs in 1998.[15] ***.[16] ***.[17] The plant does not include operations for assembly of DRAMs or DRAM modules. Instead, DRAM wafers fabricated in Eugene are sent to Hynix in Korea for assembly.[18] Hynix's Korean fabs are producers of the subject imports in this investigation, and Hynix Semiconductor America is ***.

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[6] See Memorandum to Public File for Inv. No. 731-TA-811 (Final), March 22, 1998, regarding field trip notes of USITC staff visiting the Dominion facility. See also ***.

[7] Domestic producer questionnaire of Micron, II-2, p. 3.

[8] Hearing transcript, p. 43.

[9] Domestic producer questionnaire of Micron, p. 3.

[10] Domestic producer questionnaire of Fujitsu, p. 9; petition, p. 3 and exh. 2.

[11] Domestic producer questionnaire of Fujitsu, cover page.

[12] Fujitsu, "Fujitsu Expands Flash-Memory Production in its Gresham, Oregon, Facility to Meet Requirements of the Robust Mobile Market," and "Fujitsu Microelectronics, Inc. Gresham Plant to Cease Operations," found at Internet address *http://www.fujitsumicro.com*, retrieved November 26, 2002.

[13] Domestic producer questionnaire of Fujitsu, p. 9.

[14] Fujitsu, "Fujitsu Finalizes Sale of Gresham Semiconductor Manufacturing Plant," found at Internet address *http://www.fujitsumicro.com*, retrieved November 26, 2002.

[15] Hynix Semiconductor, "History of HSMA," found at Internet address *http://www.hsaeugene.com*, retrieved November 26, 2002.

[16] Domestic producer questionnaire of HSMA, II-13, p. 7.

[17] Domestic producer questionnaire of HSMA, II-2, p. 3.

[18] Conference transcript, p. 134.

Infineon Technologies Richmond

Infineon Technologies Richmond (Infineon), Sandston, VA, was originally a joint venture between Infineon Technologies AG (formerly Siemens Semiconductors)[19] of Germany and Motorola Corp. of Schaumburg, IL.[20] Construction of the site was completed in 1997 and it began shipping DRAMs in 1998. The joint venture facility was initially known as White Oak Semiconductor. In April 2000, Infineon purchased Motorola's interest and took complete ownership of the facility. In January 2001, the White Oak name was changed to Infineon Technologies Richmond. Infineon is currently a ***, with the capacity to process approximately *** wafers per month.[21] According to Infineon, ***.[22] In addition to a wafer fab, the Infineon facility also includes a DRAM assembly and module plant.[23] Infineon is a global DRAM producer with facilities in Europe and Asia as well as the United States.

International Business Machines

During part of the period examined, International Business Machines Corp. (IBM), Armonk, NY, operated a wholly owned wafer fab in Essex Junction, VT, and had part ownership in a joint-venture fab with Toshiba in Manassas, VA (see Micron Technology Virginia) that produced DRAMs. IBM sold its stake in the Manassas joint venture in 2000.[24] According to IBM, it ceased all U.S.-DRAM fabrication in *** and completely exited the DRAM production business by ***.[25] While winding down its DRAM operations, the Vermont facility processed *** wafer starts for ***.[26] ***.[27] Following the closure of its DRAM operations, IBM's Vermont wafer fabrication and assembly and test capacity ***.

Kingston Technology Co., Inc./Payton Technology Corp.[28]

Kingston assembles DRAM modules at its manufacturing facility in Fountain Valley, CA. Payton, an affiliated company (***) of Kingston, assembles cased DRAMs from DRAM silicon wafers acquired from suppliers at its production facilities located on Kingston's Fountain Valley campus. Housed in a newly built $100 million facility, Payton completed its first production run on June 2, 2000 ***. ***. Kingston provided a producer questionnaire response for its domestic *** operations, but did not provide information on its domestic *** operations.

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[19] ITR "Who We Are," found at Internet address *http://www.whiteoaksemi.com*, retrieved November 26, 2002.

[20] Though at one time a U.S. DRAM producer, Motorola exited the DRAM business circa 1991.

[21] Domestic producer questionnaire of Infineon, II-13, p. 7

[22] Domestic producer questionnaire of Infineon, p. 3.

[23] ITR "What We Do," found at *http://www.whiteoaksemi.com*, retrieved November 26, 2002.

[24] Electronic Buyers News, "IBM to sell its stake in Dominion Semiconductor," found at Internet address *http://www.ebnonline.com*, retrieved November 26, 2002.

[25] Domestic producer questionnaire of IBM, pp. 3 and 7; petition, p. 4 and exh. 4; conference transcript, p. 50.

[26] Domestic producer questionnaire of IBM, p. 7.

[27] Staff telephone interview with *** of IBM, July 17, 2000.

[28] The information presented was obtained through the firm's producer questionnaire response and staff telephone interviews and e-mail communications with *** of Kingston, June 6, 2003, and from the following websites: *www.kingston.com* and *www.paytontech.com*, retrieved June 7, 2003.

NEC Electronics America

NEC Electronics America (NECELAM), Santa Clara, CA, is a subsidiary of NEC Corp. of Japan (NEC). NECELAM maintained a manufacturing facility in Roseville, CA, comprising a wafer fab and assembly and test capacity. In 2001, NECELAM ceased DRAM production at the Roseville facility in ***.[29] NECELAM's DRAM wafer start capacity ***. During the period examined, the Roseville facility ***.[30] NECELAM's parent company, NEC, has joined with Hitachi and Mitsubishi of Japan to form a joint venture known as Elpida Memory, Inc. (Elpida). Elpida's members continue to produce DRAMs in their facilities outside of the United States.[31]

Samsung Austin Semiconductor

Samsung Austin Semiconductor, LLC (SAS), Austin, TX, is ***-percent owned by U.S. subsidiaries of Samsung Electronics Co. Ltd. (Samsung), of Korea, and ***-percent owned by Intel Corp. of Santa Clara, CA. The Austin facility is a dedicated DRAM wafer fabrication plant. Construction of the facility began in March 1996 and DRAM production began in 1997.[32] According to SAS, ***.[33] Currently, the Austin plant is processing approximately *** wafer starts per month.[34] Wafers fabricated in the Austin facility are sent to Samsung facilities in Korea for cased DRAM assembly and in some cases module assembly.[35] Samsung has several wafer fabs producing DRAMs, as well as other semiconductor products, in Korea. Samsung Semiconductor Inc. (SSI) is ***.

Imports and Purchases of Imports by U.S. Producers

*** domestic producers (***) submitted usable questionnaire responses concerning their imports of subject DRAMs and DRAM modules or their non-import purchases of subject product. *** reported imports of subject product during the period for which data were collected in this investigation and *** reported non-import purchases of subject product. Data on their subject imports and non-import purchases of subject product relative to their U.S. production are presented in table III-2.

Table III-2
DRAMs and DRAM modules: Certain U.S. "domestic production," certain subject "imports" by U.S. producers, and ratio of "imports" to "domestic production," by firms, 2000-2002, January-March 2002, and January-March 2003

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[29] Domestic producer questionnaire of NECELAM, answer to question II-13; petition, p. 3 and exh. 3, conference transcript, p. 50.

[30] Domestic producer questionnaire of NECELAM from *DRAMs of One Megabit and Above From the Republic of Korea* (Inv. No. 731-TA-556 (Review)), attachments II-2, II-3, II-5, and II-16.

[31] Elpida, "Elpida Memory to Take On Mitsubishi Electric's DRAM Operations and Form New Partnership with Powerchip" found at Internet address *http://www.epida.com*, retrieved November 27, 2002.

[32] SAS "About Samsung; Samsung Austin," found at Internet address *http://www.sas.samsung.com*, retrieved November 26, 2002.

[33] Domestic producer questionnaire of Samsung, II-2, p. 3.

[34] Domestic producer questionnaire of Samsung, II-13, p. 7.

[35] Conference transcript, pp. 35 and 86.

U.S. CAPACITY, PRODUCTION, AND CAPACITY UTILIZATION

U.S. producers' capacity, production, and capacity utilization data for DRAMs and DRAM modules are presented in table III-3. U.S. production data, by products and firms, of DRAMs and DRAM modules are presented in table III-4. U.S. production data for various uncased DRAMs by density are shown in table III-5. Additional statistical data on U.S. production, capacity, and capacity utilization are presented in appendix D.

Table III-3
DRAMs and DRAM modules: U.S. average-of-period capacity, production,[1] and capacity utilization, by products, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March– 2002	2003
Uncased DRAMs:					
Capacity (*1,000 wafers*)[2] . . .	2,963	2,621	2,728	660	669
Wafer starts (*1,000 wafers*)[3] .	2,659	2,359	2,509	600	607
Capacity utilization (*percent*)	89.7	90.0	92.0	90.9	90.7
Cased DRAMs:					
Capacity (*1,000 units*)[4]	***	***	***	***	***
Assembly (*1,000 units*)[5]	***	***	***	***	***
Capacity utilization (*percent*)	***	***	***	***	***
DRAM modules:					
Capacity (*1,000 units*)[6]	***	***	***	***	***
Assembly (*1,000 units*)[7]	***	***	***	***	***
Capacity utilization (*percent*)	***	***	***	***	***

[1] The "production" presented for uncased DRAMs is wafer starts and that shown for cased DRAMs and modules is assembly. Although cased DRAM production data (which were collected by individual densities along with inventory and shipments data and then compiled to get a total for all cased DRAMs) should equal assembly data (which were not collected on a density basis), there may be discrepancies.
[2] U.S. producers reported wafer capacity data on the basis of 147- to 168-hour work weeks, operating 50 to 52 weeks per year.
[3] Wafer starts represent the number of raw silicon wafers introduced into the DRAM wafer fabrication process and do not account for yield loss. Wafer (probe) yield reported by U.S. producers of uncased DRAMs ranged from 54.0 to 93.5 percent during the period for which data were requested.
[4] U.S. producers reported capacity data on the basis of ***-hour work weeks, operating 50 to 52 weeks per year.
[5] Cased DRAM assembly represents the successful casing of DRAMs.
[6] U.S. producers reported capacity data on the basis of ***-hour work weeks, operating 52 weeks per year.
[7] DRAM module assembly represents the successful assembly of DRAM modules.

Note.--Wafers are on the basis of 8-inch equivalent wafers. Capacity utilization is calculated from unrounded figures, using data of firms providing both capacity and wafer start/assembly information.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table III-4
DRAMs and DRAM modules: U.S. production, by products and by firms, 2000-2002, January-March 2002, and January-March 2003

* * * * * * *

Table III-5
Uncased DRAMs: U.S. producers' reported production, by density, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March– 2002	2003
	Production (*billion bits*)				
4 Mb uncased DRAMs	***	***	***	***	***
16 Mb uncased DRAMs	***	***	***	***	***
64 Mb uncased DRAMs	***	***	***	***	***
128 Mb uncased DRAMs	***	***	***	***	***
256 Mb uncased DRAMs	***	***	***	***	***
512 Mb uncased DRAMs	***	***	***	***	***
Total	82,634,642	81,240,179	115,168,558	22,594,833	36,616,878

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

U.S. PRODUCERS' DOMESTIC AND EXPORT SHIPMENTS

Data on U.S. and export shipments of "domestic" DRAMs and DRAM modules[36] are presented in table III-6.

U.S. PRODUCERS' INVENTORIES

Data on inventories of "domestic" DRAMs and DRAM modules are presented table III-7.

U.S. EMPLOYMENT, WAGES, AND PRODUCTIVITY

U.S. producers' employment data for DRAMs and DRAM modules are presented in table III-8.

[36] "Domestic" product includes all DRAMs and DRAM modules made from U.S.-fabricated dice, regardless of where cased, plus such products made from dice that were fabricated in 3rd sources but cased in the United States. The "domestic" product also includes Samsung Korean-fabricated dice that are cased in the United States; ***.

Table III-6
DRAMs and DRAM modules: U.S. and export shipments of "domestic" product[1] by U.S. producers and importers, by types, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March– 2002	2003
	Quantity (*billion bits*)				
U.S. company transfers[2]	***	***	***	***	***
Domestic shipments[3]	***	***	***	***	***
U.S. shipments	42,903,169	50,306,631	57,440,978	13,031,975	16,481,427
"Drop shipments"[4]	***	***	***	***	***
Other exports[5]	***	***	***	***	***
All exports	32,932,238	43,229,773	54,864,842	9,590,966	25,622,087
All shipments	75,835,407	93,536,404	112,305,820	22,622,941	42,103,513
	Value (*1,000 dollars*)				
U.S. company transfers[2]	***	***	***	***	***
Domestic shipments[3]	***	***	***	***	***
U.S. shipments	4,753,307	1,555,029	1,285,246	435,948	273,969
"Drop shipments"[4]	***	***	***	***	***
Other exports[5]	***	***	***	***	***
All exports	3,065,544	1,163,263	1,202,290	284,257	395,739
All shipments	7,818,850	2,718,292	2,487,537	720,205	669,708
	Unit value (*per billion bits*)				
U.S. company transfers[2]	$***	$***	$***	$***	$***
Domestic shipments[3]	***	***	***	***	***
U.S. shipments	110.79	30.91	22.38	33.45	16.62
"Drop shipments"[4]	***	***	***	***	***
Other exports[5]	***	***	***	***	***
All exports	93.09	26.91	21.91	29.64	15.45
All shipments	103.10	29.06	22.15	31.84	15.91

[1] Includes all DRAMs and DRAM modules made from U.S.-fabricated dice, regardless of where cased, plus such products made from dice that were fabricated in 3rd sources (or in Korea by Samsung, ***) but cased in the United States.

[2] To avoid double counting, data exclude internal transfers of DRAM products used in the production of cased DRAMs and DRAM modules (for those producers that reported production of those cased DRAMs and DRAM modules).

[3] To avoid double counting, data exclude non-import purchases reported by producers of DRAM products to be used in the production of cased DRAMs and DRAM modules.

[4] "Drop shipments" are shipments reported by producers to other-than-U.S. markets of product containing either U.S. dice, or 3rd-source dice cased in the United States, that have been assembled by the producers' foreign affiliates/subcontractors into cased DRAMs or DRAM modules.

[5] "Other exports" include (1) all exports of DRAM products reported in importer questionnaires, (2) all reported exports by producers of their DRAM module production, and (3) all reported exports to non-affiliates by producers of their uncased and cased DRAMs.

Note.--Because of rounding, figures may not add to the totals shown. Unit values are calculated from the unrounded figures, using data of firms supplying both quantity and value information.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table III-7
DRAMs and DRAM modules: End-of-period inventories of "domestic" product, by origin of dice, 2000-2002, January-March 2002, and January-March 2003

* * * * * * *

Table III-8
Average number of U.S. production and related workers producing DRAMs and DRAM modules, hours worked[1] by and wages paid to such employees, and hourly wages, productivity, and unit production costs, by products, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March– 2002	January-March– 2003
	Number of production and related workers (PRWs)				
Uncased DRAMs	10,343	10,554	10,998	9,198	8,620
Cased DRAMs	***	***	***	***	***
DRAM modules	***	***	***	***	***
Total	***	***	***	***	***
	Hours worked by PRWs (*1,000 hours*)				
Uncased DRAMs	18,294	19,115	18,003	4,306	4,269
Cased DRAMs	***	***	***	***	***
DRAM modules	***	***	***	***	***
Total	***	***	***	***	***
	Wages paid to PRWs (*1,000 dollars*)				
Uncased DRAMs	592,212	560,910	558,074	126,119	133,163
Cased DRAMs	***	***	***	***	***
DRAM modules	***	***	***	***	***
Total	***	***	***	***	***
	Hourly wages paid to PRWs				
Uncased DRAMs	$32.37	$29.34	$31.00	$29.29	$31.19
Cased DRAMs	***	***	***	***	***
DRAM modules	***	***	***	***	***
Average	***	***	***	***	***
	Productivity (*million bits per hour*)				
Uncased DRAMs	4,517.0	4,250.1	6,397.2	5,247.3	8,577.4
Cased DRAMs	***	***	***	***	***
DRAM modules	***	***	***	***	***
	Unit production costs (*per billion bits*)				
Uncased DRAMs	$7.17	$6.90	$4.85	$5.58	$3.64
Cased DRAMs	***	***	***	***	***
DRAM modules	***	***	***	***	***

[1] Includes hours worked plus hours of paid leave time.

Note.--Because of rounding, figures may not add to the totals shown. Ratios are calculated using data of firms supplying both numerator and denominator information.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

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

The Commission sent importer questionnaires to 92 companies that were identified by Customs as importing products classified under HTS statistical reporting numbers 8542.21.8005, 8542.21.8021 through 8542.21.8029, and 8473.30.1040. Thirty firms supplied the Commission with usable information on their operations involving the importation of DRAMs and DRAM modules; two firms provided unusable questionnaire responses;[1] 11 firms indicated that they did not import DRAMs or DRAM modules; and 49 firms did not respond to the Commission's request for information.[2] As previously mentioned, the import data presented in this report are from 30 firms that accounted for 83.6 percent of cased DRAM imports in 2002.[3] Additional statistical data on U.S. imports, by location of dice fabrication, casing, and assembly into modules, are presented in appendix D.

U.S. IMPORTS

U.S. import data presented in the body of this report are based on data compiled from questionnaires of the Commission.[4] Official statistics are not being used in this report because Customs has determined that the country of origin of imported DRAMs is the location of assembly rather than the location of wafer fabrication. This differs from Commerce's scope language, which states that the origin of imports from Korea should be determined by the source of dice fabrication regardless of where final assembly takes place.

Table IV-1 presents U.S. imports of subject and nonsubject DRAMs and DRAM modules from all sources, by firms.[5] The subject and nonsubject U.S. imports of *** are presented separately because these firms are also domestic producers of DRAMs. Imports of subject product, by firms, are presented in table IV-2. Domestic producers *** imported the subject product during the period examined.

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[1] ***.

[2] One of the 49 nonresponding firms could not be located by Federal Express. Firms that reported that they did not import DRAM products in the preliminary phase of the investigation were not sent questionnaires during this final phase investigation.

[3] The import coverage data presented are calculated as a percentage of the total landed, duty-paid value of imports from all countries, as reported in official Commerce statistics. The HTS statistical categories applicable to uncased DRAMs and DRAM modules also include nonsubject products (see the section on U.S. Tariff Treatment). However, based on official statistics for these basket categories, the uncased DRAM and DRAM module import data, respectively, presented in this report account for 15.2 percent of imports in the basket category applicable to uncased DRAMs and 69.5 percent of imports in the basket category applicable to DRAM modules in 2002.

[4] Hynix argued in its prehearing brief that the data compiled and presented in the Commission's prehearing staff report in this investigation overstate the volume and market share of subject imports because such data double count the cased DRAMs sold by *** to *** and the DRAM modules containing such U.S.-purchased cased DRAMs sold by *** to its U.S. customers. Posthearing brief of Hynix, exh. 32. Micron argued in its posthearing brief that such data are not double counted because although *** negotiates its purchases of cased DRAMs in the United States, it arranges for the cased DRAMs to be drop-shipped by the supplier to its overseas affiliate location for module assembly. In such cases, Micron argues, those DRAMs would first physically enter the United States only as part of *** modules. Posthearing brief of Micron, p. 25. ***. Staff telephone interview with ***, July 8, 2003. *** has identified and staff has netted out in this final staff report such apparent double counting of U.S.-purchased ***.

[5] The data presented include data provided in this final phase of the investigation by several U.S. producers and other firms that were not included in the Commission's report in the preliminary phase of the investigation, as well as revisions to data previously provided by other firms.

Table IV-1
DRAMs and DRAM modules: U.S. imports of subject and nonsubject product from all sources, by firms, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March– 2002	2003
	Quantity (*billion bits*)				
U.S. producers or affiliates . . .	72,555,622	104,873,989	170,731,904	36,677,196	55,187,248
All other firms	20,334,923	35,169,510	37,364,619	10,227,234	10,744,591
Total, all firms	92,890,545	140,043,499	208,096,523	46,904,430	65,931,839
	Landed, duty-paid value (*1,000 dollars*)				
U.S. producers or affiliates . . .	7,208,957	3,458,199	4,285,727	981,106	1,045,901
All other firms	2,368,264	1,101,212	926,921	277,090	150,994
Total, all firms	9,577,221	4,559,411	5,212,648	1,258,196	1,196,895
	Unit value (*per billion bits*)				
U.S. producers or affiliates . . .	$99.36	$32.97	$25.10	$26.75	$18.95
All other firms	116.46	31.31	24.81	27.09	14.05
Average, all firms	103.10	32.56	25.05	26.82	18.15

[1] Not applicable.

Note.--Because of rounding, figures may not add to the totals shown. Unit values are calculated from the unrounded figures, using data where both quantity and value information were provided. Because of confidentiality, the data of individual firms have been removed and the data for "all other firms" have been summed.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table IV-2
DRAMs and DRAM modules: U.S. imports of subject product, by firms, 2000-2002, January-March 2002, and January-March 2003

* * * * * * *

Imports of DRAMs and DRAM modules that contain Korean dice (regardless of where cased) and 3rd-source dice not cased in the United States are presented in table IV-3. Information concerning the ratio of subject imports to U.S. production of uncased DRAMs is presented in the following tabulation:

Item	Calendar year			January-March	
	2000	2001	2002	2002	2003
Total subject imports (*quantity in billion bits*)	***	***	***	***	***
U.S. production of uncased DRAMs (*quantity in billion bits*)	82,634,642	81,240,179	115,168,558	22,594,833	36,616,878
Ratio of total subject imports to U.S. production of uncased DRAMs (*in percent*)	***	***	***	***	***

APPARENT U.S. CONSUMPTION

Table IV-4 presents apparent U.S. consumption and shipments of "domestic" and "foreign" product.

U.S. MARKET SHARES

U.S. market share data are presented in table IV-5.

Table IV-3
DRAMs and DRAM modules: U.S. imports of "foreign product,"[1] by origin of dice, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March-- 2002	2003
			Quantity (*billion bits*)		
DRAM products (regardless of where assembled) containing--					
Subject Korean dice	***	***	***	***	***
Nonsubject foreign dice	***	***	***	***	***
Total	68,475,254	115,818,984	178,646,454	39,244,036	58,605,928
			Landed, duty-paid value (*1,000 dollars*)		
DRAM products (regardless of where assembled) containing--					
Subject Korean dice	***	***	***	***	***
Nonsubject foreign dice	***	***	***	***	***
Total	7,448,870	3,819,730	4,515,043	1,080,308	1,038,387
			Unit value (*per billion bits*)		
DRAM products (regardless of where assembled) containing--					
Subject Korean dice	$***	$***	$***	$***	$***
Nonsubject foreign dice	***	***	***	***	***
Average	108.78	32.98	25.27	27.53	17.72
			Share of total quantity (*percent*)		
DRAM products (regardless of where assembled) containing--					
Subject Korean dice	***	***	***	***	***
Nonsubject foreign dice	***	***	***	***	***
Total	100.0	100.0	100.0	100.0	100.0
			Share of total value (*percent*)		
DRAM products (regardless of where assembled) containing--					
Subject Korean dice	***	***	***	***	***
Nonsubject foreign dice	***	***	***	***	***
Total	100.0	100.0	100.0	100.0	100.0

[1] "Foreign product" includes all uncased and cased DRAMs, and DRAM modules, that either contain (1) non-Samsung Korean dice (regardless of where cased) or (2) 3rd-source or Samsung Korean dice cased outside the United States.

Note.--The term "3rd source" refers to countries other than Korea and the United States; "nonsubject foreign dice" refers to 3rd-source dice plus Samsung Korean dice. Because of rounding, figures may not add to the totals shown.

Source: Compiled from data submitted in response to importer questionnaires of the U.S. International Trade Commission.

Table IV-4
DRAMs and DRAM modules: U.S. shipments of "domestic"[1] product, U.S. shipments of "foreign"[2] product, and apparent U.S. consumption, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March– 2002	2003
	Quantity (*billion bits*)				
U.S. shipments of "domestic" DRAM products made from:					
U.S. dice	***	***	***	***	***
Nonsubject foreign dice cased in the United States	***	***	***	***	***
Total	42,903,169	50,306,631	57,440,978	13,031,975	16,481,427
U.S. shipments of "foreign" DRAM products:					
Subject Korean product	***	***	***	***	***
Nonsubject foreign product	***	***	***	***	***
Total	55,867,604	96,428,993	129,427,588	29,779,599	38,792,956
Apparent consumption	98,770,774	146,735,624	186,868,566	42,811,575	55,274,383
	Value (*1,000 dollars*)				
U.S. shipments of "domestic" DRAM products made from:					
U.S. dice	***	***	***	***	***
Nonsubject foreign dice cased in the United States	***	***	***	***	***
Total	4,753,307	1,555,029	1,285,246	435,948	273,969
U.S. shipments of "foreign" DRAM products:					
Subject Korean product	***	***	***	***	***
Nonsubject foreign product	***	***	***	***	***
Total	6,922,962	3,152,029	3,299,631	945,309	725,350
Apparent consumption	11,676,269	4,707,059	4,584,877	1,381,257	999,320

[1] "Domestic" product includes DRAMs and DRAM modules made from (1) U.S.-fabricated dice, regardless of casing location, and (2) Samsung Korean-fabricated dice that were cased in the United States (***), and (3) 3rd-source-fabricated dice that were cased in the United States. Data presented are net of company transfers of uncased and cased DRAMs that were used by reporting producers of the domestic like product to make the downstream subject DRAM products. If applicable, adjustments for producer purchases of the upstream product destined for downstream production have been made to avoid double counting.

[2] "Foreign" product includes DRAMs and DRAM modules made from (1) subject (non-Samsung) Korean-fabricated dice, regardless of assembly location, and (2) Samsung Korean-fabricated and 3rd-source-fabricated dice that were not cased in the United States. Data presented are net of company transfers of uncased and cased DRAMs that were used by reporting producers of the domestic like product to make the downstream subject DRAM products. If applicable, adjustments for producer purchases of the upstream product destined for downstream production have been made to avoid double counting.

Note.--The term "3rd-source" refers to countries other than Korea and the United States. Because of rounding, figures may not add to the totals shown.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table IV-5
DRAMs and DRAM modules: Apparent U.S. consumption and market shares, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March– 2002	2003
	Apparent consumption				
Quantity (*billion bits*)	98,770,774	146,735,624	186,868,566	42,811,575	55,274,383
Value (*1,000 dollars*)	11,676,269	4,707,059	4,584,877	1,381,257	999,320
	Share of the quantity of U.S. consumption (*percent*)				
U.S. shipments of "domestic"[1] DRAM products made from:					
U.S. dice	***	***	***	***	***
Nonsubject foreign dice cased in the United States	***	***	***	***	***
Total	43.4	34.3	30.7	30.4	29.8
U.S. shipments of "foreign"[2] DRAM products:					
Subject Korean product	***	***	***	***	***
Nonsubject foreign product	***	***	***	***	***
Total	56.6	65.7	69.3	69.6	70.2
	Share of the value of U.S. consumption (*percent*)				
U.S. shipments of "domestic"[1] DRAM products made from:					
U.S. dice	***	***	***	***	***
Nonsubject foreign dice cased in the United States	***	***	***	***	***
Total	40.7	33.0	28.0	31.6	27.4
U.S. shipments of "foreign"[2] DRAM products:					
Subject Korean product	***	***	***	***	***
Nonsubject foreign product	***	***	***	***	***
Total	59.3	67.0	72.0	68.4	72.6

[1] "Domestic" product includes DRAMs and DRAM modules made from (1) U.S.-fabricated dice, regardless of casing location, and (2) Samsung Korean-fabricated dice cased in the United States (***), and (3) 3rd-source-fabricated dice that were cased in the United States. Data presented are net of company transfers of uncased and cased DRAMs that were used by reporting producers of the domestic like product to make the downstream subject DRAM products. If applicable, adjustments for producer purchases of the upstream product destined for downstream production have been made to avoid double counting.

[2] "Foreign" product includes DRAMs and DRAM modules made from (1) subject (non-Samsung) Korean-fabricated dice, regardless of assembly location, and (2) Samsung Korean-fabricated and 3rd-source-fabricated dice that were not cased in the United States. Data presented are net of company transfers of uncased and cased DRAMs that were used by reporting producers of the domestic like product to make the downstream subject DRAM products. If applicable, adjustments for producer purchases of the upstream product destined for downstream production have been made to avoid double counting.

Note.--The term "3rd-source" refers to countries other than Korea and the United States. Because of rounding, figures may not add to the totals shown; shares are computed from the unrounded figures.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

PART V: PRICING AND RELATED INFORMATION

FACTORS AFFECTING PRICES

Raw Material Costs

The primary raw materials in the production of DRAMs are silicon wafers, sawn from a cylindrical crystal. These wafers range in size from 8 to 12 inches in diameter. Raw materials cost is a very small share of total cost, but the number of saleable dice per wafer is an important determinant of individual die cost. The number of saleable dice per wafer is a function of the size of the individual die (itself a function of circuit design and process geometry) and yield. U.S. producers' reported yields were *** percent for Hynix Semiconductor Manufacturing America (HSMA), *** percent for Infineon, *** percent for Micron, and *** percent for Samsung Austin Semiconductor (SAS) in interim 2003. The average reported yield for subject Korean producer Hynix in interim 2003 was *** percent.

Transportation Costs to the U.S. Market

Transportation costs for DRAMs and DRAM modules from Korea to the United States (excluding U.S. inland transportation costs) range between 0.2 and 0.5 percent of the total cost of the product. These estimates are derived from official import data and represent the transportation and other charges on imports valued on a c.i.f. basis, as compared with customs value, for calendar 2002 and interim 2003.

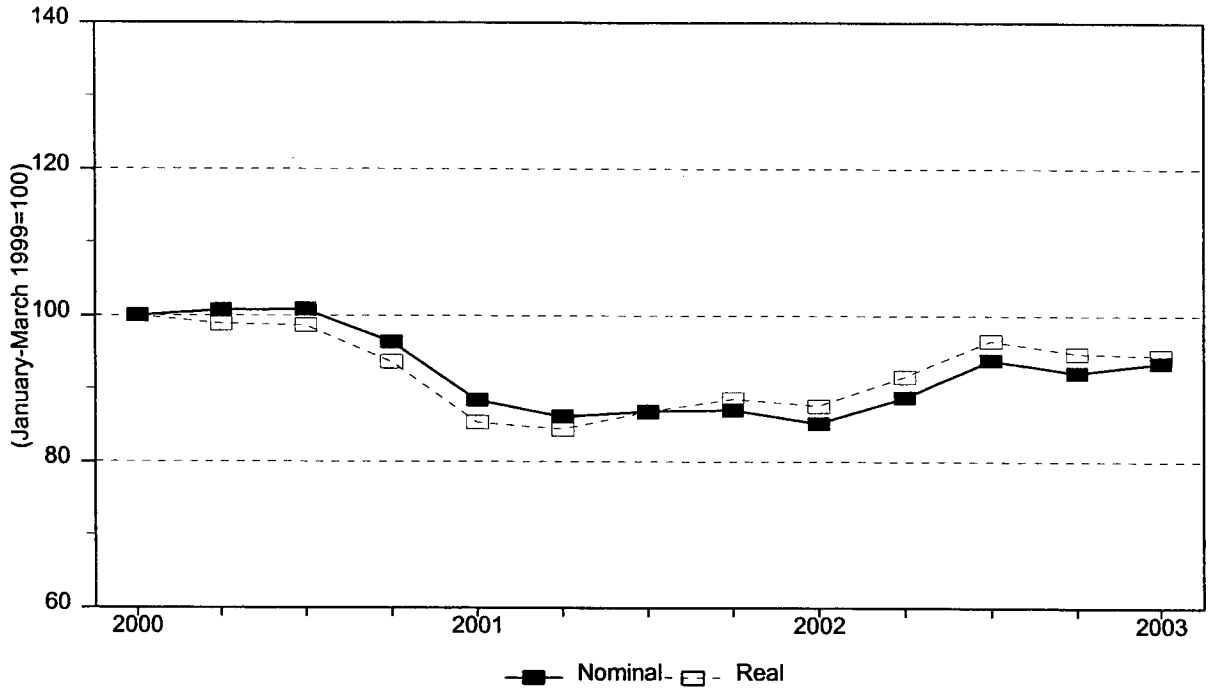
U.S. Inland Transportation Costs

U.S. inland transportation costs are also a very small share of the total cost of DRAMs and DRAM modules. All responding domestic producers and importers reported that U.S. inland freight accounts for 2 percent or less of the cost of DRAMs and DRAM modules. The majority of responding domestic producers and importers sell in the entire U.S. market. Of the 24 firms that responded to this question, 20 sell DRAMs and DRAM modules in the entire U.S. market or the 48 contiguous states, and five sell DRAMs and DRAM modules only on the West Coast.

Exchange Rates

The nominal value of the Korean won relative to the U.S. dollar declined after the third quarter of 2000, reaching a low in the first quarter of 2002 at 85.2 percent of the relative value in the first quarter of 2000. The nominal value of the Korean won relative to the U.S. dollar increased in the third quarter of 2002 to 93.9 percent of its value in the first quarter of 2000, and declined slightly to 93.6 percent of this value in the first quarter of 2003. The index of the real value of the Korean won relative to the U.S. dollar was generally below the nominal value over the first half of the period examined, and reached a low in the second quarter of 2001 at 84.5 percent of the relative value in the first quarter of 2000. During the second half of the period examined, the real value of the Korean won was generally higher than the nominal value. In the first quarter of 2003, the real value of the Korean won relative to the U.S. dollar was 94.5 percent of its relative value in the first quarter of 2000 (figure V-1).

Figure V-1
Indices of the nominal and real exchange rates of the Korean won relative to the U.S. dollar, by quarters, January 2000-March 2003



Source: International Monetary Fund, *International Financial Statistics*, May 2003.

PRICING PRACTICES

DRAMs and DRAM modules produced in the United States are largely sold to the same customers and through the same channels of distribution as subject DRAMs and DRAM modules. Most DRAMs and DRAM modules are used in computers or peripheral equipment.[1] Most DRAMs and DRAM modules are sold to three types of customers; major PC manufacturers (PC OEMs), manufacturers of other electronic equipment such as communications equipment, and purchasers other than OEMs. Many of the non-OEM customers are producers of memory or video modules, and contract electronic manufacturers. There are also some sales through authorized electronics distributors. Sales to major OEMs are usually on a contract basis. These contracts for multiple shipments generally do not specify price and quantity, but may specify the share of overall purchases awarded to a supplier.

Pricing Methods

Firms that are producers of DRAMs or affiliated with DRAM producers generally reported sales under contracts and sales in the spot market. Domestic producer Micron and importers HSA and SSI also have some sales to affiliated distributors, but these account for a small share of total sales.[2] Producers and importers for which sales under contracts account for at least 50 percent of sales include

[1] Conference transcript, p. 68, Mr. Sadler. See also Petitioner's posthearing brief, exh. 1, p. 1.

[2] Conference transcript, p. 68, Mr. Sadler, and p. 128, Mr. Swanson and Mr. Connelly.

***. Importers that are not affiliated with a DRAM producer generally reported sales in the spot market only. Both domestic producers and importers generally negotiate contracts for multiple shipments for larger customers, and participate in the spot market. Contracts do not typically specify price and quantity. Within the contract period, price and quantity are determined for shorter intervals of one week to three months.

Sales Terms and Discounts

Domestic producers and importers of DRAMs and DRAM modules generally do not publish price lists. Some producers and importers offer volume discounts. *** provides for early payment discounts. Responding domestic producers and most importers (***) reported that terms are net 30 days.

PRICE DATA

The Commission requested U.S. producers and importers of DRAMs and DRAM modules to provide quarterly data for the total quantity and value of DRAMs and DRAM modules that were shipped to unrelated customers in the U.S. market. Data were requested for the January 2000-March 2003 period. The products for which pricing data were requested are as follows:

***Cased DRAMs*:**

***Product 1*.–64 megabit (Mb) PC100 and PC133 SDRAM**
***Product 2*.–128 Mb PC100 and PC133 SDRAM**
***Product 3*.–256 Mb PC100 and PC133 SDRAM**
***Product 4*.–128 Mb DDR SDRAM**
***Product 5*.–256 Mb DDR266 SDRAM**

***DRAM modules*:**

***Product 6*.–64 Megabyte (MB) PC100 and PC133 memory module**
***Product 7*.–128 MB PC100 and PC133 memory module**
***Product 8*.–256 MB DDR266 SDRAM memory module**

Two U.S. producers and six importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters.[3] Pricing data reported by these firms accounted for approximately 45.9 percent of U.S. shipments of "domestic" DRAMs and DRAM modules and 36.9 percent of U.S. shipments of subject imports from Korea in 2002 on a value basis.

In this section and in appendix E, "domestic" products are those containing dice fabricated in the United States, regardless of the country where the dice were cased, plus those containing dice fabricated in nonsubject countries and cased in the United States.

[3] Because dice fabrication location determines whether a product is a subject import or a "domestic" product (except that 3rd-source dice cased in the United States are "domestic"), importers may report pricing data for "domestic" product and U.S. producers may report pricing data for subject product. ***. *** nonsubject DRAMs and DRAM modules containing dice fabricated in nonsubject countries.

Price Trends

As in previous investigations involving DRAMs, the average unit values of DRAMs and DRAM modules declined over the period examined. All of the pricing products chosen were among those sold in the largest volumes by domestic producers and importers of DRAMs and DRAM modules. All are standard DRAMs, either SDRAMs or double data rate (DDR) SDRAMs rather than specialty DRAMs. U.S. sales of product 1 (64Mb SDRAMs) and products 6 and 7 (64MB and 128MB SDRAM modules) were reported throughout the period by both domestic producers and importers of the subject product. U.S. sales of subject imports of product 2 (128Mb SDRAMs) were also reported throughout the period. U.S. sales of domestically produced 128Mb SDRAMs, and U.S. sales of 256Mb SDRAMs and 128Mb DDR SDRAMs from domestic producers and importers of the subject product were first reported during the period examined.

Prices for most products and channels of distribution declined substantially over the period examined. Prices for products 1 and 6 (64Mb SDRAMs and 64MB SDRAM modules), which were produced in larger volumes at the beginning of the period, generally declined less than prices for other products. Reported price declines are summarized in table V-1. For products with sales over a shorter time period, prices in the first month with reported sales of both domestic product and subject imports were compared to the last month with reported sales of both domestic product and subject imports.

Price Comparisons

Prices for domestic products and subject imports followed the same general trends and were very similar for sales to PC OEMs across all products. There were more differences in prices reported for sales to other OEMs, and particularly for sales of DRAM modules (products 6, 7, and 8) to non-OEMs. Subject imports generally undersold domestic product 1 sold to non-OEMs. Margins for product 2 were mixed, but with more instances of underselling than overselling in all channels of distribution since January 2002. Average unit values for subject product 3 were most often above those for domestic product 3 on sales to PC OEMs and other OEMs, and below those for domestic product 3 on sales to non-OEMs. Domestic producers entered the market for product 4 after substantial price declines for the subject product. Average unit values of subject product 4 sold to non-OEMs were most often above those for domestic product in late 2000 and all of 2001, and below those for domestic product 4 since January 2002. Sales of subject products 7 and 8 (128MB SDRAM and 256MB DDR266 modules) undersold domestic products in the majority of possible comparisons in all channels of distribution since January 2002.

Reported average unit values and quantities of domestic products and subject imports sold in the three channels of distribution are reported in tables V-2-V-17. Margins of underselling (overselling) are summarized in table V-18, and presented graphically in appendix E. Appendix E also contains tables that identify the lowest priced firm in each month by product and channel of distribution.

Table V-1
Reported declines (increases) in prices of pricing products, by channels of distribution, January 2000-March 2003

Product	PC OEMs		Other OEMs		Non-OEMs	
	U.S. product	Subject imports	U.S. product	Subject imports	U.S. product	Subject imports
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
1	73.9 [1]	***	79.8	***	65.5	***
2	86.3 [2]	***	77.3	***	81.8	***
3	89.1 [3]	***	87.8 [4]	***	80.7 [5]	***
4	25.9 [6]	***	23.1 [7]	***	87.3 [8]	***
5	66.1 [9]	***	47.9 [10]	***	43.0 [11]	***
6	68.5	***	75.7 [12]	***	63.8	***
7	70.5	***	85.6 [13]	***	83.7	***
8	40.3 [14]	***	43.2 [15]	***	49.8 [14]	***

1 ***.
2 ***.
3 ***.
4 ***.
5 ***.
6 ***.
7 ***.
8 ***.
9 ***.
10 ***.
11 ***.
12 ***.
13 ***.
14 ***.
15 ***.

Note.–Comparisons are between prices in January 2000 and March 2003, except where noted.

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

Table V-2
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 1 sold to PC OEMs and other OEMs as reported by U.S. producers and importers, with margins of underselling/(overselling), by month, January 2000-March 2003

* * * * * * *

Table V-3
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 1 sold to non-OEMs as reported by U.S. producers and importers, with margins of underselling/ (overselling), by month, January 2000-March 2003

* * * * * * *

Table V-4
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 2 sold to PC OEMs and other OEMs as reported by U.S. producers and importers, with margins of underselling/(overselling), by month, January 2000-March 2003

* * * * * * *

Table V-5
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 2 sold to non-OEMs as reported by U.S. producers and importers, with margins of underselling/ (overselling), by month, January 2000-March 2003

* * * * * * *

Table V-6
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 3 sold to PC OEMs and other OEMs as reported by U.S. producers and importers, with margins of underselling/(overselling), by month, January 2000-March 2003

* * * * * * *

Table V-7
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 3 sold to non-OEMs as reported by U.S. producers and importers, with margins of underselling/ (overselling), by month, January 2000-March 2003

* * * * * * *

Table V-8
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 4 sold to PC OEMs and other OEMs as reported by U.S. producers and importers, with margins of underselling/(overselling), by month, January 2000-March 2003

* * * * * * *

Table V-9
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 4 sold to non-OEMs as reported by U.S. producers and importers, with margins of underselling/ (overselling), by month, January 2000-March 2003

* * * * * * *

Table V-10
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 5 sold to PC OEMs and other OEMs as reported by U.S. producers and importers, with margins of underselling/(overselling), by month, January 2000-March 2003

* * * * * * *

Table V-11
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 5 sold to non-OEMs as reported by U.S. producers and importers, with margins of underselling/ (overselling), by month, January 2000-March 2003

* * * * * * *

Table V-12
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 6 sold to PC OEMs and other OEMs as reported by U.S. producers and importers, with margins of underselling/(overselling), by month, January 2000-March 2003

* * * * * * *

Table V-13
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 6 sold to non-OEMs as reported by U.S. producers and importers, with margins of underselling/ (overselling), by month, January 2000-March 2003

* * * * * * *

Table V-14
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 7 sold to PC OEMs and other OEMs as reported by U.S. producers and importers, with margins of underselling/(overselling), by month, January 2000-March 2003

* * * * * * *

Table V-15
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 7 sold to non-OEMs as reported by U.S. producers and importers, with margins of underselling/ (overselling), by month, January 2000-March 2003

* * * * * * *

Table V-16
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 8 sold to PC OEMs and other OEMs as reported by U.S. producers and importers, with margins of underselling/(overselling), by month, January 2000-March 2003

* * * * * * *

Table V-17
Weighted-average f.o.b. prices and quantities of "domestic" and subject Korean product 8 sold to non-OEMs as reported by U.S. producers and importers, with margins of underselling/ (overselling), by month, January 2000-March 2003

* * * * * * *

Table V-18
Instances of underselling (overselling) by subject product, by customer type, January 2000-March 2003

Product and channel		2000		2001		2002		Jan.-Mar. 2003		Total	
		Under	Over	Under	Over	Under	Over	Under	Over	Under	Over
1	PC OEMs	3	6	2	4	3	1	(1)	(1)	8	11
	Other OEMs	7	5	8	2	8	4	2	1	25	12
	Non-OEMs	12	0	12	0	11	1	2	0	37	1
2	PC OEMs	2	9	2	9	7	2	0	1	11	21
	Other OEMs	5	7	6	6	9	3	2	1	22	17
	Non-OEMs	7	5	9	3	10	2	3	0	29	10
3	PC OEMs	0	3	3	6	3	8	0	2	6	19
	Other OEMs	1	1	2	9	3	7	2	0	8	17
	Non-OEMs	(1)	(1)	8	4	11	1	2	0	21	5
4	PC OEMs	(1)	(1)	(1)	(1)	3	2	1	0	4	2
	Other OEMs	(1)	(1)	3	3	7	5	0	3	10	11
	Non-OEMs	0	3	2	8	9	3	3	0	14	14
5	PC OEMs	(1)	(1)	(1)	(1)	3	3	2	1	5	4
	Other OEMs	(1)	(1)	(1)	(1)	1	2	1	2	2	4
	Non-OEMs	(1)	(1)	(1)	(1)	2	4	1	2	3	6
All cased DRAMs	PC OEMs	5	18	7	19	19	16	3	4	34	57
	Other OEMs	13	13	19	20	28	21	7	7	67	61
	Non-OEMs	19	8	31	15	43	11	11	2	104	36
6	PC OEMs	2	10	8	4	1	3	3	0	14	17
	Other OEMs	1	9	4	4	6	1	(1)	(1)	11	14
	Non-OEMs	12	0	1	11	7	3	3	0	23	14
7	PC OEMs	4	8	7	5	10	2	3	0	24	15
	Other OEMs	6	5	8	4	5	2	2	0	21	11
	Non-OEMs	12	0	12	0	11	1	3	0	38	1
8	PC OEMs	(1)	(1)	8	2	8	4	3	0	19	6
	Other OEMs	(1)	(1)	7	1	2	0	(1)	(1)	9	1
	Non-OEMs	(1)	(1)	0	3	10	1	3	0	13	4
All Modules	PC OEMs	6	18	23	11	19	9	9	0	57	38
	Other OEMs	7	14	19	9	13	3	2	0	41	26
	Non-OEMs	24	0	13	14	28	5	9	0	74	19

[1] No comparisons between domestic and subject imported product in the period.

Source: Tables V-2-V-17.

Infineon argues in its prehearing brief (pp. 5-7) that market practices such as most favored customer clauses magnify the impact of low-priced imports on market prices. Hynix notes in its prehearing brief (pp. 86-89) that even in cases in which the price of subject imports is below the average price from domestic producers, a domestic producer or nonsubject importer may be the low-cost supplier, and presents (exh. 20) an analysis of the low-priced supplier in each period. Petitioner argues in its posthearing brief (p. 10 and exh. 1, pp. 2-10) against using the lowest-price analysis presented by Hynix. Tables E-1 and E-2 identify the lowest-cost supplier in each month, by product and channel of distribution. Data in these tables include only that reported for *** domestic production, *** nonsubject imports, and subject imports from Korea. Data from importers other than *** were not included in this analysis. Importers generally did not identify the specific fabricating firm, and were only asked to provide data regarding domestic products and those fabricated in Korea. It is also not clear that pricing by suppliers other than the major producers of DRAMs trigger the market practices reported by Infineon.[4]

LOST SALES AND LOST REVENUES

The Commission requested U.S. producers of DRAMs and DRAM modules to report any instances of lost sales or revenues they experienced due to competition from imports of DRAMs and DRAM modules from Korea during January 1999-March 2003. Of the four producers currently fabricating DRAMs in the United States, *** reported that they had to reduce prices and had lost sales due to competition from the subject product.[5] *** identified specific instances of lost sales and lost revenues.

The petitioner reported that the nature of transactions involving DRAMs makes it difficult to document specific instances of sales lost to subject imports. Lost revenues are somewhat easier to identify, as some customers allegedly refer to a competitive offer from an importer of the subject product and ask for a lower price. Domestic producers identified *** instances of alleged lost sales to *** during *** totaling $***, and *** instances of alleged lost revenues in sales to *** customers totaling $***.[6] Staff contacted the customers involved. Lost sales and revenues allegations are summarized in table V-19.

Table V-19
Lost sales and revenues allegations

* * * * * * *

[4] For example, Infineon's posthearing brief, exhs. 2 and 8 refer to "major suppliers" and "qualified majors." Also, ***, contacted by telephone on June 26, 2003, reported that *** has agreements with its suppliers of DRAM modules under which a supplier will agree to *** of other major suppliers, defined as those that supply at least *** percent of purchases.

[5] *** did not respond to this section of the Commission questionnaire.

[6] ***.

PART VI: FINANCIAL CONDITION OF THE U.S. PRODUCERS

BACKGROUND

Nine firms[1] provided financial data on their DRAM operations.[2] These data accounted for all of reported U.S. production of DRAMs during the reporting period.

Financial data include cased and uncased DRAMs and modules containing DRAMs. Because of the mix of products (there are various densities for all the products), quantities sold have little correlation with financial performance on a per-unit basis and thus were not requested in the financial section of the questionnaire.[3]

OPERATIONS ON DRAMS

The results of the U.S. producers' DRAM operations are presented in table VI-1.[4] The net sales value decreased substantially in 2001 compared to 2000 while cost of goods sold decreased less and the operating expenses increased, causing an operating loss. The net sales value decreased slightly in 2002 compared to 2001 while cost of goods sold and the operating expenses decreased, resulting in less of an operating loss. The combined companies also incurred operating losses in the interim periods. The detail of commercial sales and transfers to related firms is presented in table VI-2. The combined companies incurred gross losses in 2001, 2002, and interim 2003.

Table VI-1
Results of operations of U.S. producers with respect to DRAMs, fiscal years 2000-2002, January-March 2002, and January-March 2003

* * * * * * *

Table VI-2
Detail of commercial net sales and company transfers of U.S. producers with respect to DRAMs, fiscal years 2000-2002, January-March 2002, and January-March 2003

* * * * * * *

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[1] *** have fiscal yearends of December 31. ***; however, all three companies provided data on a calendar year basis. *** has a fiscal yearend of March 31.

[2] The companies were requested to report domestic and export commercial sales, internal consumption, and transfers to related firms of DRAMs and DRAM modules produced from wafers and dice fabricated in the United States, regardless of assembly location, plus foreign dice assembled in the United States.

[3] Financial data reported to the SEC by Infineon in its form 6-K and by Micron in its form 10-K were consistent with the financial data provided in their questionnaire responses.

[4] Payton Technology Corp., a *** of Kingston Technology Corp., provided financial data on ***. ***. If Kingston/Payton were included in the financial data, the combined companies' operating income (loss) margins would be 32.2 percent in 2000, (79.2) percent in 2001, (50.8) percent in 2002, (17.3) percent in interim 2002, and (51.6) percent in interim 2003.

Table VI-3 presents selected data on a firm-by-firm basis. ***[5] had decreased net sales value, operating income, and operating income margins in 2001 compared to 2000. *** had increased net sales value, operating income, and operating income margins while *** had decreases in 2002 compared to 2001 and *** had decreased sales but improved operating income and operating income margins. *** had increased net sales value and operating income margins while *** had improved operating income in interim 2003 compared to interim 2002; however, *** had decreased net sales value, and they had a greater operating loss and operating loss margin in interim 2003 compared to interim 2002.

Table VI-3
Selected financial data with respect to DRAMs, by firm, fiscal years 2000-2002, January-March 2002, and January-March 2003

* * * * * * *

INVESTMENT IN PRODUCTIVE FACILITIES, CAPITAL EXPENDITURES, AND RESEARCH AND DEVELOPMENT EXPENSES

Capital expenditures, research and development (R&D) expenses, and the value of fixed assets, by firm, are shown in table VI-4. Capital expenditures decreased in each comparative period. R&D expenses decreased from 2000 to 2001 and then increased in each subsequent comparative period. The producers were requested to provide data on research and development, capital expenditures, and property, plant, and equipment by production process for uncased DRAMs, cased DRAMs, and DRAM modules. *** reported the bulk of the expenditures were for uncased DRAMs and the least of the expenditures were for DRAM modules.

Table VI-4
Capital expenditures, research and development expenses, and value of assets of U.S. producers with respect to DRAMs, fiscal years 2000-2002, January-March 2002, and January-March 2003

* * * * * * *

CAPITAL AND INVESTMENT

The Commission requested U.S. producers to describe any actual or potential negative effects of imports of DRAMs from Korea on their firms' growth, investment, and ability to raise capital or development and production efforts (including efforts to develop a derivative or more advanced version of the product). Their responses are shown in appendix F.

[5] ***.

PART VII: THREAT CONSIDERATIONS

The Commission analyzes a number of factors in making threat determinations (see 19 U.S.C. § 1677(7)(F)(i)). Information on the nature of the subsidies was presented earlier in this report; 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;" and any other threat indicators, if applicable, follows.

THE INDUSTRY IN KOREA

According to the petitioner, Korea accounts for 11 of the 30 manufacturing lines worldwide that fabricate DRAMs.[1] The petitioner believes that two firms, Hynix and Samsung, represent virtually all Korean DRAM production.[2] In its final determination, Commerce found countervailable subsidy rates for Hynix; however, such rates were found to be *de minimis* for Samsung. Therefore, the foreign industry data presented in this section of the report are only those provided by Hynix in its questionnaire response. Capacity, production, and capacity utilization data, by product, are presented in table VII-1; subject inventory and shipments data are presented in table VII-2; and data on subject uncased DRAM production by individual densities are presented in table VII-3. Additional data, by product, concerning the Korean industry are presented in appendix D.[3]

Table VII-1
DRAMs and DRAM modules: Hynix's Korean average-of-period capacity, production, and capacity utilization, by products, 2000-2002, January-March 2002, January-March 2003, and projected 2003-2004

* * * * * * *

Table VII-2
Subject DRAMs and DRAM modules: Hynix's Korean inventories and shipments, 2000-2002, January-March 2002, January-March 2003, and projected 2003-2004

* * * * * * *

Table VII-3
Uncased DRAMs: Hynix's reported Korean production, by density, 2000-2002, January-March 2002, January-March 2003, and projected 2003-2004

* * * * * * *

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[1] Conference transcript, p. 23.

[2] Petition, p. 13.

[3] Data for subject Korean production of cased DRAMs and DRAM modules (tables D-6 and D-7, respectively) are presented separately from nonsubject Korean production of cased DRAMs and DRAM modules (tables D-8 and D-9, respectively). Capacity utilization shown in table VII-1 includes production of nonsubject (i.e., not made from Korean-fabricated dice) merchandise.

On a year-to-year basis, the Hynix data show that exports of the subject DRAM products to the United States increased (on the basis of bits) throughout the period for which data were requested in this investigation and are projected to increase further in 2003 and 2004. As a share of total Hynix shipments, exports to the United States rose in 2001, reached a peak in January-March 2002, and then decreased during full year 2002 and January-March 2003. The share of total Hynix shipments held by exports to the United States is projected to decrease in full year 2003 and in 2004.

Hynix is the successor firm to two earlier Korean DRAM manufacturers, Hyundai Electronics Industries (HEI) and LG Semicon (LG). In 1999, HEI purchased the DRAM assets of LG, and merged them with its own.[4] In 2001, HEI's name was changed to Hynix and it was financially separated from the larger Hyundai industrial conglomeration. Hynix's producer questionnaire includes consolidated data for the operations of Hynix, HEI, and LG.

Hynix's current business operations are focused on semiconductors.[5] Although Hynix manufactures a variety of semiconductors in Korea, DRAMs represent *** of both its sales and production capacity.[6] In 2002, *** percent of its total sales were accounted for by DRAMs and DRAM modules.[7] According to Hynix, the equipment and machinery that it uses to produce DRAMs ***.[8] In 2000, DRAMs accounted for *** percent of Hynix's wafer starts; this figure increased to between *** percent and *** percent during the remainder of the period examined.[9] Hynix's share of assembly capability devoted to DRAMs fluctuated between a low of *** percent in 2000 and a high of *** percent in January-March 2002.[10]

During 2000-2002, Hynix's DRAM wafer starts declined by *** percent from *** to ***. Hynix is projecting that DRAM wafer starts will increase *** in 2003 and then decrease in 2004 to *** under the 2002 level. Wafer probe yield increased from *** percent in 2000 to *** percent in 2001, before falling to *** percent in 2002. Hynix reports that all wafer starts during the period examined were ***.[11]

According to Hynix, it *** DRAM production capacity in Korea. Specifically, Hynix states that it has ***. Further, Hynix notes that in efforts to ***.[12]

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[4] Petition, pp. 15-16, and Hynix Semiconductor, "History," found at Internet address *http://www.hynix.co.kr*, retrieved November 8, 2002.

[5] Hynix Semiconductor, "Business Scope," found at Internet address *http://www.hynix.co.kr*, retrieved November 8, 2002. In addition to making semiconductor products for its own sale, Hynix also acts as a contract manufacturer wherein it allocates a certain portion of its production capacity to manufacturing semiconductor devices on a fee-for-service basis for other semiconductor companies.

[6] In addition to its Korean DRAM operations, Hynix also fabricates DRAMs in the United States. According to its questionnaire response, Hynix ***. Foreign producer questionnaire of Hynix, II-11, pp. 9-10.

[7] Foreign producer questionnaire of Hynix, II-2 and II-3, p. 5.

[8] Foreign producer questionnaire of Hynix, II-3, p. 5.

[9] Foreign producer questionnaire of Hynix, II-3, pp. 5-6.

[10] Foreign producer questionnaire of Hynix, II-3, p. 7.

[11] Foreign producer questionnaire of Hynix, II-12, p. 11.

[12] Foreign producer questionnaire of Hynix, II-3, pp. 4-5.

With regard to the potential for product-shifting, Hynix currently ***. According to Hynix, switching products would ***.[13] Hynix argues that shifting from DRAM to non-DRAM products ***. According to Hynix, this is because ***.[14]

Prior to October 2000, both of Hynix's predecessors (HEI and LG) were subject to a U.S. antidumping duty order on DRAMs of one megabit and above from Korea. However, according to Hynix, the antidumping duty had no effect on its (HEI's or LG's) participation in the U.S. market. Reportedly, this is evidenced by the fact that when the antidumping order was in effect, Hynix (HEI and LG) increased its U.S. market share, and when the order was revoked, Hynix's market share decreased. According to Hynix, neither the order nor the termination of the order had any effect on the market.[15]

COUNTERVAILING DUTY INVESTIGATIONS IN OTHER COUNTRIES

DRAMs from Korea also are currently the subject of a countervailing duty investigation in the European Union (EU). In April 2003, the Commission of the European Communities determined the rate of the provisional duty applicable to the net free-at-Community-frontier price, before duty, is zero percent for Samsung and 33 percent for all other companies.[16] Recent press reports indicate that the EU has now found in its draft final directive that the rate of the definitive countervailing duty should be 34.9 percent for Hynix. A formal decision on the draft final directive is due by August 25, 2003.[17] Petitioner argued that increased Korean exports to the United States were likely if the EU placed provisional duties on Korean DRAMs as a result of its investigation.[18] During 2002, *** percent, on the basis of value, of Hynix's Korean exports of DRAM products to non-U.S. markets were to the EU. These exports to the EU, valued at $*** in 2002, are projected to increase to $*** in 2003 and to $*** in 2004. In 2003 and 2004, Hynix's Korean exports to the EU are projected to constitute *** percent of Hynix's export shipments to non-U.S. markets.

According to press reports, the filing of subsidy complaints against DRAMs produced by Hynix are also being considered in both Taiwan and Japan. Press reports indicate that Nanya Technologies Corp., Taiwan's largest maker of DRAMs, has reportedly joined forces with other Taiwan firms, including Mosel Vitelic, Inc., Winbond Electronics Corp., and Powerchip Semiconductor Corp., and they plan to file a trade complaint with Taiwan's Fair Trade Commission and Ministry of Finance seeking tariffs on imports from South Korean chipmakers that they say are receiving unfair government

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[13] Foreign producer questionnaire of Hynix, II-3, p. 5.

[14] Foreign producer questionnaire of Hynix, II-3, p. 5.

[15] Conference transcript, p. 119.

[16] Official Journal of the European Communities, *Commission Regulation (EC) No 708/2003 of 23 April 2003 imposing a provisional countervailing duty on imports of certain electronic microcircuits known as DRAMs (dynamic random access memories) originating in the Republic of Korea*, L102/7, April 24, 2003.

[17] Matthew Newman, Dow Jones Newswires, "EU to Impose 34% Duty on Hynix Microchips - Sources," July 3, 2003; The New York Times, "Seoul Warns Europe Not to Raise Tariffs on Hynix Chips," July 5, 2003; Yonhap News Service, "Hynix Set to Challenge EU's Move to Impose Duties on Chips," June 25, 2003.

[18] Postconference brief of Micron, p. 49.

subsidies.[19] Press reports also indicate that Elpida is may seek similar government action in Japan against imported Hynix DRAMs.[20]

U.S. INVENTORIES OF SUBJECT PRODUCT FROM KOREA

End-of-period inventories of "foreign" product held in the United States are shown in table VII-4. Inventories of subject DRAM products increased during 2000-2002 but decreased between the interim periods. Inventories of nonsubject "foreign" product increased throughout the period examined.

Table VII-4
DRAMs and DRAM modules: U.S. end-of-period inventories of "foreign product,"[1] by origin of dice, 2000-2002, January-March 2002, and January-March 2003

Item	2000	2001	2002	January-March-- 2002	2003
	Quantity (*billion bits*)				
DRAM products (regardless of where assembled) containing--					
Subject Korean dice	***	***	***	***	***
Nonsubject foreign dice	***	***	***	***	***
Total	4,684,740	5,238,314	7,383,547	6,215,543	10,363,255
	Ratio to total shipments of imports, on the basis of bits (*percent*)				
DRAM products (regardless of where assembled) containing--					
Subject Korean dice	***	***	***	***	***
Nonsubject foreign dice	***	***	***	***	***
Average	6.8	4.6	4.2	4.0	4.7

[1] "Foreign product" includes all uncased and cased DRAMs, and DRAM modules, that either contain subject (non-Samsung) Korean dice (regardless of where cased) or nonsubject foreign (Samsung-Korean or 3rd-source) dice cased outside the United States.

Note.--The term "3rd-source" refers to countries other than Korea and the United States. Because of rounding, figures may not add to the totals shown. Ratios are calculated from the unrounded figures using data where both comparable numerator and denominator information were supplied. Part-year inventory ratios are annualized.

Source: Compiled from data submitted in response to importer questionnaires of the U.S. International Trade Commission.

[19] Reuters, "Taiwan Chip Firms Seek Tariff on S. Korean Rivals," April 17, 2003, found at Internet address *http://asia.news.yahoo.com/030417/3/w144.html*; Yahoo!News, "Taiwan Looks Out for Korean DRAM Flood," April 21, 2003, found at Internet address *http://au.news.yahoo.com/030421/20/p/jo16.html*; and Taipei Times, "Memory Chipmakers to Seek Import Tariffs," April 18, 2003, found at Internet address *http://www.taipeitimes.com/News/biz/archives/2003/04/18/202543/print.*

[20] Semiconductor Business News, "DRAM Bulletin: Asia Adds to Hynix Woes," June 26, 2003, found at Internet address *http://www.siliconstrategies.com/story/OEG20030626S0022.*

APPENDIX A

FEDERAL REGISTER NOTICES

INTERNATIONAL TRADE COMMISSION

[Investigation No. 701–TA–431 (Final)]

Drams and Dram Modules From Korea

AGENCY: United States International Trade Commission.

ACTION: Scheduling of the final phase of a countervailing duty investigation.

SUMMARY: The Commission hereby gives notice of the scheduling of the final phase of countervailing duty investigation No. 701–TA–432 (Final) under section 705(b) of the Tariff Act of 1930 (19 U.S.C. 1671d(b)) (the Act) to determine whether an industry in the United States is materially injured or threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of subsidized imports from Korea of DRAMs and DRAM modules, provided for in subheadings 8473.30.10 and 8542.21.80 of the Harmonized Tariff Schedule of the United States.[1]

For further information concerning the conduct of this phase of the investigation, hearing procedures, and rules of general application, consult the Commission's Rules of Practice and Procedure, part 201, subparts A through E (19 CFR part 201), and part 207, subparts A and C (19 CFR part 207).

EFFECTIVE DATE: April 7, 2003.

FOR FURTHER INFORMATION CONTACT: Mary Messer (202–205–3193), Office of Investigations, U.S. International Trade

[1] For purposes of this investigation, the Department of Commerce has defined the subject merchandise as DRAMs from Korea, whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut die, and cut die. Processed wafers fabricated in Korea, but assembled into finished semiconductors outside Korea are also included in the scope. Processed wafers fabricated outside Korea and assembled into finished semiconductors in Korea are not included in the scope.

The scope of this investigation additionally includes memory modules containing DRAMs from Korea. A memory module is a collection of DRAMs, the sole function of which is memory. Memory modules include single in-line processing modules, single in-line memory modules, dual in-line memory modules, small outline dual in-line memory modules, Rambus in-line memory modules, and memory cards or other collections of DRAMs, whether unmounted or mounted on a circuit board. Modules that contain other parts that are needed to support the function of memory are covered. Only those modules that contain additional items which alter the function of the module to something other than memory, such as video graphics adapter boards and cards, are not included in the scope. This investigation also covers future DRAM module types.

The scope of this investigation additionally includes, but is not limited to, video random access memory and synchronous graphics RAM, as well as various types of DRAMs, including fast page-mode, extended data-out, burst extended data-out, synchronous dynamic RAM, Rambus DRAM, and Double Data Rate DRAM. The scope also includes any future density, packaging, or assembling of DRAMs. Also included in the scope of this investigation are removable memory modules placed on motherboards, with or without a central processing unit, unless the importer of the motherboards certifies with the Customs Service that neither it, nor a party related to it or under contract to it, will remove the modules from the motherboards after importation. The scope of this investigation does not include DRAMs or memory modules that are re-imported for repair or replacement.

Commission, 500 E Street SW., Washington, DC 20436. Hearing-impaired persons can obtain information on this matter by contacting the Commission's TDD terminal on 202–205–1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000. General information concerning the Commission may also be obtained by accessing its Internet server (*http://www.usitc.gov*). The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov*.

SUPPLEMENTARY INFORMATION:

Background. The final phase of this investigation is being scheduled as a result of an affirmative preliminary determination by the Department of Commerce that certain benefits which constitute subsidies within the meaning of section 703 of the Act (19 U.S.C. 1671b) are being provided to manufacturers, producers, or exporters in Korea of DRAMs and DRAM modules. The investigation was requested in a petition filed on November 1, 2002, by Micron Technology, Inc., Boise, ID.

Participation in the investigation and public service list. Persons, including industrial users of the subject merchandise and, if the merchandise is sold at the retail level, representative consumer organizations, wishing to participate in the final phase of this investigation as parties must file an entry of appearance with the Secretary to the Commission, as provided in § 201.11 of the Commission's rules, no later than 21 days prior to the hearing date specified in this notice. A party that filed a notice of appearance during the preliminary phase of the investigation need not file an additional notice of appearance during this final phase. The Secretary will maintain a public service list containing the names and addresses of all persons, or their representatives, who are parties to the investigation.

Limited disclosure of business proprietary information (BPI) under an administrative protective order (APO) and BPI service list. Pursuant to 207.7(a) of the Commission's rules, the Secretary will make BPI gathered in the final phase of this investigation available to authorized applicants under the APO issued in the investigation, provided that the application is made no later than 21 days prior to the hearing date specified in this notice. Authorized applicants must represent interested parties, as defined by 19 U.S.C. 1677(9), who are parties to the investigation. A party granted access to BPI in the preliminary phase of the investigation need not reapply for such access. A separate service list will be maintained by the Secretary for those parties authorized to receive BPI under the APO.

Staff report. The prehearing staff report in the final phase of this investigation will be placed in the nonpublic record on June 10, 2003, and a public version will be issued thereafter, pursuant to section 207.22 of the Commission's rules.

Hearing. The Commission will hold a hearing in connection with the final phase of this investigation beginning at 9:30 a.m. on June 24, 2003, at the U.S. International Trade Commission Building. Requests to appear at the hearing should be filed in writing with the Secretary to the Commission on or before June 17, 2003. A nonparty who has testimony that may aid the Commission's deliberations may request permission to present a short statement at the hearing. All parties and nonparties desiring to appear at the hearing and make oral presentations should attend a prehearing conference to be held at 9:30 a.m. on June 19, 2003, at the U.S. International Trade Commission Building. Oral testimony and written materials to be submitted at the public hearing are governed by §§ 201.6(b)(2), 201.13(f), and 207.24 of the Commission's rules. Parties must submit any request to present a portion of their hearing testimony *in camera* no later than 7 days prior to the date of the hearing.

Written submissions. Each party who is an interested party shall submit a prehearing brief to the Commission. Prehearing briefs must conform with the provisions of § 207.23 of the Commission's rules; the deadline for filing is June 17, 2003. Parties may also file written testimony in connection with their presentation at the hearing, as provided in § 207.24 of the Commission's rules, and posthearing briefs, which must conform with the provisions of § 207.25 of the Commission's rules. The deadline for filing posthearing briefs is July 1, 2003; witness testimony must be filed no later than three days before the hearing. In addition, any person who has not entered an appearance as a party to the investigation may submit a written statement of information pertinent to the subject of the investigation on or before July 1, 2003. On July 16, 2003, the Commission will make available to parties all information on which they have not had an opportunity to comment. Parties may submit final comments on this information on or before July 18, 2003, but such final comments must not contain new factual information and must otherwise comply with § 207.30 of the Commission's rules. All written submissions must conform with the provisions of § 201.8 of the Commission's rules; any submissions that contain BPI must also conform with the requirements of §§ 201.6, 207.3, and 207.7 of the Commission's rules. The Commission's rules do not authorize filing of submissions with the Secretary by facsimile or electronic means, except to the extent permitted by § 201.8 of the Commission's rules, as amended, 67 FR 68036 (November 8, 2002).

In accordance with §§ 201.16(c) and 207.3 of the Commission's rules, each document filed by a party to the investigation must be served on all other parties to the investigation (as identified by either the public or BPI service list), and a certificate of service must be timely filed. The Secretary will not accept a document for filing without a certificate of service.

Authority: This investigation is being conducted under authority of title VII of the Tariff Act of 1930; this notice is published pursuant to § 207.21 of the Commission's rules.

By order of the Commission.

Issued: April 11, 2003.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. 03–9333 Filed 4–15–03; 8:45 am]

BILLING CODE 7020–02–P

DEPARTMENT OF COMMERCE

International Trade Administration

[C-580-851]

Final Affirmative Countervailing Duty Determination: Dynamic Random Access Memory Semiconductors from the Republic of Korea

AGENCY: Import Administration, International Trade Administration, Department of Commerce.

ACTION: Notice of final affirmative countervailing duty determination.

SUMMARY: The Department of Commerce has made a final determination that countervailable subsidies are being provided to certain producers and exporters of dynamic random access memory semiconductors from the Republic of Korea. For information on the estimated countervailing duty rates, please see the "Suspension of Liquidation" section, below.

EFFECTIVE DATE: June 23, 2003.

FOR FURTHER INFORMATION CONTACT: Ryan Langan, Jesse Cortes, or Daniel J. Alexy, Office of Antidumping/ Countervailing Duty Enforcement, Group 1, Import Administration, U.S. Department of Commerce, Room 3099, 14th Street and Constitution Avenue, N.W., Washington, D.C. 20230; telephone(202) 482–2613, (202) 482–3986, and (202) 482–1540, respectively.

SUPPLEMENTARY INFORMATION:

Petitioner

The petitioner in this investigation is Micron Technology, Inc. ("the petitioner").

Period of Investigation

The period for which we are measuring subsidies, or period of investigation, is January 1, 2001 through June 30, 2002.

Case History

The following events have occurred since the publication of the preliminarydetermination in the **Federal Register** on April 7, 2003. *See*

Preliminary Affirmative Countervailing Duty Determination: Dynamic Random Access Memory Semiconductors from the Republic of Korea (68 FR 16766) ("*Preliminary Determination*").

On April 7, 2003, the petitioner submitted comments alleging that Samsung Electronics Co., Ltd., ("SEC") was uncreditworthy during the period 1997 through 1999. SEC filed rebuttal information relating to this allegation on April 10 and 17, 2003. The Department of Commerce ("the Department") initiated an investigation of SEC's creditworthiness for 1998 only in an April 17, 2003 memorandum to Louis Apple entitled "Samsung Electronics Co., Ltd. Uncreditworthiness Allegation," which is on file in the Department's Central Records Unit in Room B-099 of the main Department building ("CRU"). SEC and the petitioner filed further comments on this creditworthiness investigation subsequent to its initiation.

On April 8, 2003, Hynix Semiconductor, Inc. ("Hynix") submitted ministerial error allegations relating to the *Preliminary Determination*. The petitioner filed a response to these allegations on April 14, 2003. We addressed these ministerial error allegations in an April 16, 2003 memorandum to Louis Apple entitled "Ministerial Error Allegations for Preliminary Determination," which is on file in the Department's CRU.

We issued supplemental questionnaires to SEC, Hynix, and the Government of the Republic of Korea ("GOK") on April 8, and May 5, 6, and 20, 2003. We received responses to these supplemental questionnaires on April 14 and 16, and May 13, 15, and 22, 2003. The respondents, the petitioner, and interested parties also submitted factual information, comments, and arguments at numerous instances prior to the final determination based on various deadlines for submissions of factual and information and/or arguments established by the Department subsequent to the *Preliminary Determination*.

From April 21 to May 3, 2003, we conducted verification of the questionnaire responses submitted by the GOK, Hynix, and SEC.

On May 28, 2003, the Department issued a memorandum entitled "Preliminary Determination on New Subsidy Allegations and New Subsidies Discovered in the Course of Investigation" ("*Supplemental Preliminary Determination Memo*") that addressed two new allegations raised by the petitioner just prior to the *Preliminary Determination*, as well as one new program discovered during verification.

We received case briefs from the GOK, SEC, Hynix, Infineon Technologies North America Corporation and Infineon Technologies Richmond, LP (a domestic producer and an interested party in this proceeding), and the petitioner on May 22, 2003. The parties submitted rebuttal briefs on May 30, 2003. On June 2, 2003, the petitioner and the GOK/SEC submitted supplemental case briefs on the issues addressed in the Department's *Supplemental Preliminary Determination Memo*. These same parties submitted rebuttal briefs on these topics on June 4, 2003. We held a hearing in this investigation on June 6, 2003.

Scope of Investigation

The products covered by this investigation are dynamic random access memory semiconductors ("DRAMS") from the Republic of Korea ("ROK"), whether assembled or unassembled. Assembled DRAMS include all package types. Unassembled DRAMS include processed wafers, uncut die, and cut die. Processed wafers fabricated in the ROK, but assembled into finished semiconductors outside the ROK are also included in the scope. Processed wafers fabricated outside the ROK and assembled into finished semiconductors in the ROK are not included in the scope.

The scope of this investigation additionally includes memory modules containing DRAMS from the ROK. A memory module is a collection of DRAMS, the sole function of which is memory. Memory modules include single in-line processing modules, single in-line memory modules, dual in-line memory modules, small outline dual in-line memory modules, Rambus in-line memory modules, and memory cards or other collections of DRAMS, whether unmounted or mounted on a circuit board. Modules that contain other parts that are needed to support the function of memory are covered. Only those modules that contain additional items which alter the function of the module to something other than memory, such as video graphics adapter boards and cards, are not included in the scope. This investigation also covers future DRAMS module types.

The scope of this investigation additionally includes, but is not limited to, video random access memory and synchronous graphics random access memory, as well as various types of DRAMS, including fast page-mode, extended data-out, burst extended data-out, synchronous dynamic RAM, Rambus DRAM, and Double Data Rate DRAM. The scope also includes any future density, packaging, or assembling of DRAMS. Also included in the scope of this investigation are removable memory modules placed on motherboards, with or without a central processing unit, unless the importer of the motherboards certifies with the U.S. Bureau of Customs and Border Protection ("Customs") that neither it, nor a party related to it or under contract to it, will remove the modules from the motherboards after importation. The scope of this investigation does not include DRAMS or memory modules that are re-imported for repair or replacement.

The DRAMS subject to this investigation are currently classifiable under ubheadings 8542.21.8005 and 8542.21.8021 through 8542.21.8029 of the Harmonized Tariff Schedule of the United States ("HTSUS"). The memory modules containing DRAMS from the ROK, described above, are currently classifiable under subheadings 8473.30.10.40 or 8473.30.10.80 of the HTSUS. Although the HTSUS subheadings are provided for convenience and customs purposes, the Department's written description of the scope of this investigation remains dispositive.

Injury Test

Because the ROK is a "Subsidies Agreement Country" within the meaning of section 701(b) of the Tariff Act of 1930, as amended by the Uruguay Round Agreements Act effective January 1, 1995 ("the Act"), the International Trade Commission ("ITC") is required to determine whether imports of the subject merchandise from the ROK materially injure, or threaten material injury to, a U.S. industry. On December 13, 2002, the ITC made its preliminary determination that there is a reasonable indication that an industry in the United States is being materially injured by reason of imports from the ROK of the subject merchandise. *See Drams and Dram Modules from Korea*, 67 FR 79148 (December 27, 2002).

Analysis of Comments Received

All issues raised in the case and rebuttal briefs by parties to this investigation are addressed in the "Issues and Decision Memorandum" from Jeffrey May, Deputy Assistant Secretary, Import Administration, to Joseph A. Spetrini, Acting Assistant Secretary, Import Administration, dated June 16, 2003 ("*Decision Memorandum*"), which is hereby adopted by this notice. Attached to this

notice as an Appendix is a list of the issues which parties have raised and to which we have responded in the *Decision Memorandum*. Parties can find a complete discussion of all issues raised in this investigation and the corresponding recommendations in this public memorandum which is on file in the CRU. In addition, a complete version of the *Decision Memorandum* can be accessed directly on the Internet at *http://ia.ita.doc.gov/frn/* under the heading "Korea." The paper copy and electronic version of the *Decision Memorandum* are identical in content.

Suspension of Liquidation

As a result of our *Preliminary Determination*, we instructed Customs to suspend liquidation of all entries of DRAMS from the ROK which were entered or withdrawn from warehouse, for consumption on or after April 7, 2003, the date of the publication of the *Preliminary Determination* in the **Federal Register** (with the exception of entries from SEC as we preliminarily determined SEC's rate to be *de minimis*).

In accordance with section 705(c)(1)(C) of the Act, we are directing Customs to continue to suspend liquidation of all imports of the subject merchandise from the ROK that are entered, or withdrawn from warehouse, for consumption on or after the date of publication of this notice in the **Federal Register**, with the exception of entries for SEC, for whom we have determined the net subsidy rate to be *de minimis*. These suspension of liquidation instructions will remain in effect until further notice.

We determine the total estimated net subsidy rate for each company to be the following:

Producer/Exporter	Net Subsidy Rate
Samsung Electronics Co., Ltd.	0.04 percent (*de minimis*)
Hynix Semiconductor Inc. (formerly, Hyundai Electronics Industries Co., Ltd.)	44.71 percent
All Others	44.71 percent

In accordance with sections 777A(e)(2)(B) and 705(c)(5)(A) of the Act, we have set the "all others" rate as Hynix' rate because the rate for SEC, the only other investigated company, is *de minimis*.

We will issue a countervailing duty order if the ITC issues a final affirmative injury determination and we will instruct Customs to require a cash deposit of estimated countervailing duties for such entries of merchandise in the amounts indicated above. If the ITC determines that material injury, or threat of material injury, does not exist, this proceeding will be terminated and all estimated duties deposited or securities posted as a result of the suspension of liquidation will be refunded or canceled.

ITC Notification

In accordance with section 705(d) of the Act, we will notify the ITC of our determination. In addition, we are making available to the ITC all non-privileged and non-proprietary information related to this investigation. We will allow the ITC access to all privileged and business proprietary information in our files, provided the ITC confirms that it will not disclose such information, either publicly or under an Administrative Protective Order ("APO"), without the written consent of the Assistant Secretary for Import Administration.

Return or Destruction of Proprietary Information

In the event that the ITC issues a final negative injury determination, this notice will serve as the only reminder to parties subject to an APO of their responsibility concerning the destruction of proprietary information disclosed under APO in accordance with 19 CFR 351.305(a)(3). Failure to comply is a violation of the APO.

This determination is published pursuant to sections 703(f) and 777(i) of the Act.

Dated: June 16, 2003.

Joseph A. Spetrini,

Acting Assistant Secretary for Import Administration.

APPENDIX

List of Comments and Issues in the Decision Memorandum

Comment 1: Direction of Credit
Comment 2: Specificity Relating to Direction of Credit
Comment 3: Application of Commercial Benchmarks to Determine the Amount of Benefits to Hynix Semiconductor Inc. (formerly, Hyundai Electronics Industries Co., Ltd. ("HEI")) ("Hynix")
Comment 4: Direction of Credit Through the Government of the Republic of Korea's ("GOK") Control of the Bond Market
Comment 5: Hynix Creditworthiness
Comment 6: Korea Development Bank ("KDB") Fast Track Program
Comment 7: Hynix October 2001 Debt-to-Equity Conversion
Comment 8: Hynix October 2001 Debt Forgiveness
Comment 9: Hynix Five-Year Interest-Free Loan Stemming from October 2001 Restructuring
Comment 10: Hynix October 2001 Retroactive Reduction of Accrued Interest as Part of Debt-Equity Swap
Comment 11: Hynix Benefit from Convertible Bonds ("CB") Arising Between Issuance and Conversion Stemming from October 2001 Restructuring
Comment 12: Treating Loans to Hynix in Excess of Banking Act Exposure Limitations and Documents Against Acceptance ("D/A") Financing as Grants
Comment 13: D/A Interest Rates
Comment 14: Hynix Sales
Comment 15: Hynix Short-Term Financing
Comment 16: Ministerial Errors In Certain Hynix Preliminary Determination Calculations
Comment 17: Use of LG Semiconductor, Inc. ("LG Semicon") Bonds as Hynix Benchmarks
Comment 18: Calculation of Uncreditworthy Benchmarks
Comment 19: Other General Benchmark Issues
Comment 20: Samsung Electronics Co., Ltd. ("SEC") Creditworthiness
Comment 21: Facts Available for SEC's Unreported Short- and Long-Term Financing
Comment 22: Treatment of Certain SEC Interest Payments
Comment 23: SEC Sales
Comment 24: Energy Savings Fund ("ESF") Program
Comment 25: De Facto Specificity of Certain Tax Programs Under the Tax Reduction and Exemption Control Act ("TERCL") and/or the Restriction of Special Taxation Act ("RSTA")
Comment 26: RSTA Article 26 and Import Substitution
Comment 27: 21st Century Frontier Research and Development ("R&D") Program
Comment 28: Other R&D Programs
Comment 29: Export Insurance Program
Comment 30: Electricity Discounts Under the Requested Load Adjustment ("RLA") Program

Comment 31: Duty Drawback on Non-Physically Incorporated Items and Excessive Loss Rates, and on Domestic Sales of Finished Products Manufactured from Imported Raw Materials
Comment 32: Import Duty Reduction for Cutting Edge Products
Comment 33: Permission for Hynix and SEC to Build in Restricted Area
Comment 34: Exemption of Value-Added Tax ("VAT") on Imports Used for Bonded FactoriesUnder Construction

[FR Doc. 03–15793 Filed 6–20–03; 8:45 am]
BILLING CODE 3510–DS–S

DEPARTMENT OF COMMERCE

International Trade Administration

[C-580-851]

Notice of Amended Final Affirmative Countervailing Duty Determination: Dynamic Random Access Memory Semiconductors from the Republic of Korea

AGENCY: Import Administration, International Trade Administration, Department of Commerce.

ACTION: Notice of amended final affirmative countervailing duty determination.

SUMMARY: On June 16, 2003, the Department of Commerce issued the *Final Affirmative Countervailing Duty Determination: Dynamic Random Access Memory Semiconductors from the Republic of Korea.* On June 23, 2003, the Department published in the **Federal Register** the *Final Affirmative Countervailing Duty Determination: Dynamic Random Access Memory Semiconductors from the Republic of Korea*, 68 FR 37122. On June 24, 2003, Hynix Semiconductors, Inc., filed allegations of ministerial errors. On June 30, 2003, the petitioner, Micron Technologies, Inc., filed a response to the allegations. Based on our review of the comments received from all parties regarding the alleged ministerial errors, we have revised the estimated countervailing duty rate for Hynix Semiconductors, Inc., as well as the "All Others" rate. The revisions to the estimated countervailing duty rates are listed below in the "Amended Final Determination" section.

EFFECTIVE DATE: July 28, 2003.

FOR FURTHER INFORMATION CONTACT: Ryan Langan or Jesse Cortes, Office of Antidumping/Countervailing Duty Enforcement, Group 1, Import Administration, U.S. Department of Commerce, Room 3099, 14th Street and Constitution Avenue, N.W., Washington, D.C. 20230; telephone(202) 482–2613 and (202) 482–3986, respectively.

SUPPLEMENTARY INFORMATION:

Scope of Investigation

The products covered by this investigation are dynamic random access memory semiconductors ("DRAMS") from the Republic of Korea ("ROK"), whether assembled or unassembled. Assembled DRAMS include all package types. Unassembled DRAMS include processed wafers, uncut die, and cut die. Processed wafers fabricated in the ROK, but assembled into finished semiconductors outside the ROK are also included in the scope. Processed wafers fabricated outside the ROK and assembled into finished semiconductors in the ROK are not included in the scope.

The scope of this investigation additionally includes memory modules containing DRAMS from the ROK. A memory module is a collection of DRAMS, the sole function of which is memory. Memory modules include single in-line processing modules, single in-line memory modules, dual in-line memory modules, small outline dual in-line memory modules, Rambus in-line memory modules, and memory cards or other collections of DRAMS, whether unmounted or mounted on a circuit board. Modules that contain other parts that are needed to support the function of memory are covered. Only those modules that contain additional items which alter the function of the module to something other than memory, such as video graphics adapter boards and cards, are not included in the scope. This investigation also covers future DRAMS module types.

The scope of this investigation additionally includes, but is not limited to, video random access memory and synchronous graphics random access memory, as well as various types of DRAMS, including fast page-mode, extended data-out, burst extended data-out, synchronous dynamic RAM, Rambus DRAM, and Double Data Rate DRAM. The scope also includes any future density, packaging, or assembling of DRAMS. Also included in the scope of this investigation are removable memory modules placed on motherboards, with or without a central processing unit, unless the importer of the motherboards certifies with the U.S. Bureau of Customs and Border Protection ("Customs") that neither it, nor a party related to it or under contract to it, will remove the modules from the motherboards after importation. The scope of this investigation does not include DRAMS or memory modules that are re-imported for repair or replacement.

The DRAMS subject to this investigation are currently classifiable under subheadings 8542.21.8005 and 8542.21.8021 through 8542.21.8029 of the *Harmonized Tariff Schedule of the United States* ("HTSUS"). The memory modules containing DRAMS from the ROK, described above, are currently classifiable under subheadings 8473.30.10.40 or 8473.30.10.80 of the HTSUS. Removable memory modules placed on motherboards are classifiable under subheading 8471.50.0085. Although the HTSUS subheadings are provided for convenience and customs purposes, the Department's written description of the scope of this investigation remains dispositive.

Period of Investigation

The period for which we are measuring subsidies, or period of investigation, is January 1, 2001, through June 30, 2002.

Amended Final Determination

In accordance with section 705(d) of the Tariff Act of 1930, as amended, ("the Act"), on June 23, 2003, the Department published in the **Federal Register** the *Final Affirmative Countervailing Duty Determination: Dynamic Random Access Memory Semiconductors from the Republic of Korea*, 68 FR 37122. Subsequently, on June 24, 2003, Hynix Semiconductor, Inc. ("Hynix" or "respondent") submitted timely ministerial error allegations pursuant to 19 CFR 351.224(c)(2). On June 30, 2003, the petitioner, Micron Technologies, Inc. ("Micron"), submitted a rebuttal to Hynix' allegations.

Hynix alleged that, for certain loans, the Department erroneously applied uncreditworthy benchmark interest rates to financing obtained before Hynix was determined to be uncreditworthy. The petitioner rebutted these allegations stating that they related to methodological issues, not ministerial issues. Additionally, the petitioner identified data that showed that Hynix' allegations were for loans that were

refinanced and, therefore, the Department correctly used uncreditworthy benchmark rates for these loans after the refinancing date. Hynix further alleged that the Department used long-term benchmark rates in the benefit calculations for three short-term loans, which were refinanced for an additional year. Micron claimed that this allegation is methodological, not ministerial, and should be rejected. Hynix then alleged that the Department erroneously included interest payments that accrued outside of the POI in its benefit calculations. Micron argued that this does not constitute a ministerial error because it is solely related to the methodology used by the Department. Hynix also alleged that the Department attributed the wrong percentage of KDB Fast Track bonds to Hynix' creditors because of debt conversions that occurred in June and December, 2001. Micron claimed that this allegation constitutes a methodological error allegation and, therefore, should be rejected by the Department. Finally, Hynix alleged that the Department failed to include the second of two interest payments that were made for the same bond but were reported separately. Micron stated that there is no evidence on the record linking the alleged second payment to the bonds identified by Hynix and, therefore, the Department must reject this allegation.

After analyzing the submissions, we have determined, in accordance with section 705(e) of the Act and 19 CFR 351.224, that we made the following ministerial errors in the margin calculations for Hynix: 1) For certain loans, we did not use the correct benchmark for financing obtained prior to the period during which we found Hynix to be uncreditworthy; 2) We incorrectly used a long-term benchmark interest rate for one loan that was refinanced for one year; 3) For KDB Fast Track bonds, we incorrectly calculated the percentage of these bonds held by Hynix' creditors after June 2001, and December 2001. For a detailed discussion of the ministerial error allegations and the Department's analysis, see the July 21, 2003 memorandum from Team to Laurie Parkhill, Acting Deputy Assistant Secretary entitled *Ministerial Error Allegations for the Final Determination*, which is on file in the Department's Central Records Unit in Room B-099 of the main Department building.

Therefore, we are amending the final determination for the countervailing duty investigation of dynamic random access memory semiconductors from the Republic of Korea to reflect the corrections of the above-noted ministerial errors. The revised total estimated net subsidy rate for each company is as follows:

Producer/Exporter	Net Subsidy Rate
Samsung Electronics Co., Ltd.	0.04 percent (de minimis) (unchanged from the Final Determination)
Hynix Semiconductor Inc. (formerly, Hyundai Electronics Industries Co., Ltd.)	44.29 percent
All Others	44.29 percent

Suspension of Liquidation

In accordance with section 705(c)(1)(B) of the Act, we are directing Customs to continue suspending liquidation on all imports of subject merchandise from the Republic of Korea, except for imports of subject merchandise from Samsung Electronics Co., Ltd., that are entered, or withdrawn from warehouse, for consumption on or after the date of publication of this notice in the **Federal Register**. Customs shall require a cash deposit or the posting of a bond equal to the margin/subsidy rates indicated in the chart above. These suspension of liquidation instructions will remain in effect until further notice.

We will issue a countervailing duty order if the International Trade Commission ("ITC") issues a final affirmative injury determination. If the ITC determines that material injury, or threat of material injury, does not exist, this proceeding will be terminated and all estimated duties deposited or securities posted as a result of the suspension of liquidation will be refunded or canceled.

ITC Notification

In accordance with section 705(d) of the Act, we will notify the ITC of our amended final determination.

This determination is published pursuant to sections 705(d) and 777(i) of the Act.

Dated: July 21, 2003.

Joseph A. Spetrini,

Acting Assistant Secretary for Grant Aldonas, Under Secretary.

[FR Doc. 03–19141 Filed 7–25–03; 8:45 am]

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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:	DRAMs and DRAM Modules from Korea
Inv. No.:	701-TA-431 (Final)
Date and Time:	June 24, 2003 - 9:30 a.m.

Sessions were held in connection with this investigation in the Main Hearing Room (room 101), 500 E Street, SW, Washington, DC

CONGRESSIONAL APPEARANCES:

The Honorable Larry E. Craig, United States Senator, State of Idaho
The Honorable Ron Wyden, United States Senator, State of Oregon
The Honorable Peter A. DeFazio, U.S. Congressman, 4th District, State of Oregon

OPENING REMARKS:

Petitioner/Domestic Producers (**Gilbert B. Kaplan**, Hale and Dorr LLP)
Respondents (**Daniel L. Porter**, Willkie Farr & Gallagher)

In Support of the Imposition of Countervailing Duties:

Hale and Dorr LLP
Washington, D.C.
on behalf of

Micron Technology, Inc. ("Micron")

Steven R. Appleton, Chairman, President, and CEO, Micron
Michael Sadler, Vice President, Worldwide Sales, Micron
Jerry Hausman, Professor, Department of Economics, Massachusetts Institute of Technology
Mark Love, Senior Vice President, Economic Consulting Services
Bonnie B. Byers, Economist, Hale and Dorr LLP

Gilbert B. Kaplan)
) – OF COUNSEL
Michael D. Esch)

In Support of the Imposition
of Countervailing Duties (continued):

Collier Shannon Scott, PLLC
Washington, D.C.
on behalf of

Infineon Technologies North America Corp.
Infineon Technologies Richmond, LP

Robert LeFort, President, Infineon Technologies North America Corp.
Henry Becker, Vice President and Managing Director, Infineon Technologies Richmond, LP
Patrick J. Magrath, Managing Director, Georgetown Economic Services
Gina E. Beck, Economic Consultant, Georgetown Economic Services

Paul C. Rosenthal)
Kathleen W. Cannon) – OF COUNSEL
Eric R. McClafferty)

In Opposition to the Imposition
of Countervailing Duties:

Willkie Farr & Gallagher
Washington D.C.
on behalf of

Hynix Semiconductor Inc.
Hynix Semiconductor America

Oh-chul Kwon, Vice President, Hynix Semiconductor Inc.
Farhad Tabrizi, Vice President, Worldwide Marketing, Hynix Semiconductor America
Gary Swanson, Senior Vice President, Sales, Hynix Semiconductor America

James P. Durling)
) – OF COUNSEL
Daniel L. Porter)

REBUTTAL/CLOSING REMARKS:

Petitioner/Domestic Producers (**Gilbert B. Kaplan**, Hale and Dorr LLP;
Paul C. Rosenthal, Collier Shannon Scott, PLLC; and **Steven R. Appleton**,
Chairman, President, and CEO, Micron)
Respondents (**James P. Durling**, Willkie Farr & Gallagher)

APPENDIX C

SUMMARY DATA

Table C-1
DRAMs and DRAM modules: Summary data concerning the U.S. market, 2000-2002, January-March 2002, and January-March 2003

(Quantity=*billion bits, except where noted*; value=*1,000 dollars*; unit values and unit production costs are per *billion bits*; period changes=*percent, except where noted*)

Item	Reported data					Period changes			
				January-March--					Jan.-Mar.
	2000	2001	2002	2002	2003	2000-02	2000-01	2001-02	2002-03
U.S. consumption quantity:									
Amount	98,770,774	146,735,624	186,868,566	42,811,575	55,274,383	+89.2	+48.6	+27.4	+29.1
"Domestic" product share[1]	43.4	34.3	30.7	30.4	29.8	-12.7	-9.2	-3.5	-0.6
"Foreign" product share:[1]									
Subject Korean dice	***	***	***	***	***	***	***	***	***
Nonsubject foreign dice	***	***	***	***	***	***	***	***	***
Total	56.6	65.7	69.3	69.6	70.2	+12.7	+9.2	+3.5	+0.6
U.S. consumption value:									
Amount	11,676,269	4,707,059	4,584,877	1,381,257	999,320	-60.7	-59.7	-2.6	-27.7
"Domestic" product share[1]	40.7	33.0	28.0	31.6	27.4	-12.7	-7.7	-5.0	-4.1
"Foreign" product share:[1]									
Subject Korean dice	***	***	***	***	***	***	***	***	***
Nonsubject foreign dice	***	***	***	***	***	***	***	***	***
Total	59.3	67.0	72.0	68.4	72.6	+12.7	+7.7	+5.0	+4.1
"Foreign" product of/from--									
Subject Korean dice:									
U.S. shipments quantity	***	***	***	***	***	***	***	***	***
U.S. shipments value	***	***	***	***	***	***	***	***	***
Unit value	$***	$***	$***	$***	$***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
Nonsubject foreign dice:									
U.S. shipments quantity	***	***	***	***	***	***	***	***	***
U.S. shipments value	***	***	***	***	***	***	***	***	***
Unit value	$***	$***	$***	$***	$***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
All "foreign" dice:									
U.S. shipments quantity	55,867,604	96,428,993	129,427,588	29,779,599	38,792,956	+131.7	+72.6	+34.2	+30.3
U.S. shipments value	6,922,962	3,152,029	3,299,631	945,309	725,350	-52.3	-54.5	+4.7	-23.3
Unit value	$123.92	$32.69	$25.49	$31.74	$18.70	-79.4	-73.6	-22.0	-41.1
Ending inventory quantity	4,684,740	5,238,314	7,383,547	6,215,543	10,363,255	+57.6	+11.8	+41.0	+66.7
"Domestic" product of/from U.S. dice or nonsubject foreign dice cased in the United States:									
U.S. shipments:									
Quantity	42,903,169	50,306,631	57,440,978	13,031,975	16,481,427	+33.9	+17.3	+14.2	+26.5
Value	4,753,307	1,555,029	1,285,246	435,948	273,969	-73.0	-67.3	-17.3	-37.2
Unit value	$110.79	$30.91	$22.38	$33.45	$16.62	-79.8	-72.1	-27.6	-50.3
Export shipments:									
Quantity	32,932,238	43,229,773	54,864,842	9,590,966	25,622,087	+66.6	+31.3	+26.9	+167.1
Exports/shipments[1]	43.4	46.2	48.9	42.4	60.9	+5.4	+2.8	+2.6	+18.5
Value	3,065,544	1,163,263	1,202,290	284,257	395,739	-60.8	-62.1	+3.4	+39.2
Unit value	$93.09	$26.91	$21.91	$29.64	$15.45	-76.5	-71.1	-18.6	-47.9
Ending inventory quantity	***	***	***	***	***	***	***	***	***
U.S. producers'--									
Average capacity (*1,000 wafers*)	2,963	2,621	2,728	660	669	-7.9	-11.5	+4.1	+1.4
Wafer starts (*1,000 wafers*)	2,659	2,359	2,509	600	607	-5.7	-11.3	+6.3	+1.2
Capacity utilization[1]	89.7	90.0	92.0	90.9	90.7	+2.2	+0.3	+2.0	-0.2
Production quantity of uncased DRAMs	82,634,642	81,240,179	115,168,558	22,594,833	36,616,878	+39.4	-1.7	+41.8	+62.1
Production workers	***	***	***	***	***	***	***	***	***
Hours worked (*1,000 hours*)	***	***	***	***	***	***	***	***	***
Wages paid (*$1,000*)	***	***	***	***	***	***	***	***	***
Hourly wages	$***	$***	$***	$***	$***	***	***	***	***
Financial data:									
Net sales value	***	***	***	***	***	***	***	***	***
Cost of goods sold (COGS)	***	***	***	***	***	***	***	***	***
Gross profit (loss)	***	***	***	***	***	***	***	***	***
Operating expenses	***	***	***	***	***	***	***	***	***
Operating income (loss)	***	***	***	***	***	***	***	***	***
Capital expenditures	***	***	***	***	***	***	***	***	***
COGS/net sales[1]	***	***	***	***	***	***	***	***	***
Operating income (loss)/net sales[1]	***	***	***	***	***	***	***	***	***

[1] 'Reported data' are in percent and 'period changes' are in percentage-point.
[2] Not defined (one of the periods had a negative figure and the other had a positive figure).

Note.--Period changes are derived from the unrounded data. "Domestic" product includes DRAMs and DRAM modules made from U.S. dice (regardless of where cased) plus nonsubject foreign (Samsung-Korean, ***, and 3rd-source) dice cased in the United States. "Foreign" product includes DRAMS and DRAM modules made from subject Korean dice (regardless of where cased) and nonsubject foreign (Samsung-Korean and 3rd-source) dice not cased in the United States. Period changes involving negative period data are positive if the amount of the negativity decreases and negative if the amount of the negativity increases. Because of rounding, figures may not add to the totals shown. Unit values and other ratios are calculated from the unrounded figures, using data of firms supplying both numerator and denominator information. Part-year inventory ratios are annualized.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table C-2
DRAMs and DRAM modules: Summary data concerning the U.S. market (with domestic industry data excluding Hynix (HSMA)), 2000-2002, January-March 2002, and January-March 2003

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APPENDIX D

ADDITIONAL STATISTICAL TABLES

Table D-1
Uncased DRAMs: U.S. capacity, wafer starts, production, and capacity utilization, by firms, 2000-2002, January-March 2002, and January-March 2003

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Table D-2
Cased DRAMs: U.S. capacity, assembly, production, and capacity utilization, by firms, 2000-2002, January-March 2002, and January-March 2003

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Table D-3
DRAM modules: U.S. capacity, assembly, production, and capacity utilization, by firms, 2000-2002, January-March 2002, and January-March 2003

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Table D-4
DRAMs and DRAM modules: U.S. imports, by sources and by origin of dice, 2000-2002, January-March 2002, and January-March 2003

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Table D-5
Uncased DRAMs: Hynix's Korean capacity, wafer starts, production, inventories, capacity utilization, and shipments, 2000-2002, January-March 2002, January-March 2003, and projected 2003-2004

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Table D-6
Subject cased DRAMs: Hynix's Korean capacity, assembly, production, inventories, capacity utilization, and shipments, 2000-2002, January-March 2002, January-March 2003, and projected 2003-2004

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Table D-7
Subject DRAM modules: Hynix's Korean capacity, assembly, production, inventories, capacity utilization, and shipments, 2000-2002, January-March 2002, January-March 2003, and projected 2003-2004

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Table D-8
Nonsubject cased DRAMs: Hynix's Korean production, inventories, and shipments, 2000-2002, January-March 2002, January-March 2003, and projected 2003-2004

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Table D-9
Nonsubject DRAM modules: Hynix's Korean production, inventories, and shipments, 2000-2002, January-March 2002, January-March 2003, and projected 2003-2004

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APPENDIX E

PRICE DATA

Figure E-1
Product 1: Weighted-average f.o.b. prices reported by U.S. producers and importers of subject product 1 from Korea, sold to PC OEMs, Other OEMs, and Non-OEMs January 2000-March 2003

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Figure E-2
Product 2: Weighted-average f.o.b. prices reported by U.S. producers and importers of subject product 2 from Korea, sold to PC OEMs, Other OEMs, and Non-OEMs January 2000-March 2003

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Figure E-3
Product 3: Weighted-average f.o.b. prices reported by U.S. producers and importers of subject product 3 from Korea, sold to PC OEMs, Other OEMs, and Non-OEMs January 2000-March 2003

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Figure E-4
Product 4: Weighted-average f.o.b. prices reported by U.S. producers and importers of subject product 4 from Korea, sold to PC OEMs, Other OEMs, and Non-OEMs January 2000-March 2003

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Figure E-5
Product 5: Weighted-average f.o.b. prices reported by U.S. producers and importers of subject product 5 from Korea, sold to PC OEMs, Other OEMs, and Non-OEMs January 2000-March 2003

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Figure E-6
Product 6: Weighted-average f.o.b. prices reported by U.S. producers and importers of subject product 6 from Korea, sold to PC OEMs, Other OEMs, and Non-OEMs January 2000-March 2003

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Figure E-7
Product 7: Weighted-average f.o.b. prices reported by U.S. producers and importers of subject product 7 from Korea, sold to PC OEMs, Other OEMs, and Non-OEMs January 2000-March 2003

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Figure E-8
Product 8: Weighted-average f.o.b. prices reported by U.S. producers and importers of subject product 8 from Korea, sold to PC OEMs, Other OEMs, and Non-OEMs January 2000-March 2003

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Table E-1
Reported low-priced source of DRAMs in each month, by product and channel of distribution

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Table E-2
Reported low-priced source of DRAM modules in each month, by product and channel of distribution

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Table E-3
Instances for which reported prices for products 1, 2, and 3 were the lowest reported for the month, by product and channel of distribution

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Table E-4
Instances for which reported prices for products 4 and 5 were the lowest reported for the month, by product and channel of distribution

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Table E-5
Instances for which reported prices for products 6, 7, and 8 were the lowest reported for the month, by product and channel of distribution

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APPENDIX F

ALLEGED EFFECTS OF SUBJECT IMPORTS ON U.S. FIRMS' EXISTING DEVELOPMENT AND PRODUCTION EFFORTS, GROWTH, INVESTMENT, AND ABILITY TO RAISE CAPITAL

Responses of U.S. firms to the following question: Since January 1, 2000, has your firm experienced any actual negative effects on its return on investment or its 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 DRAMs or DRAM modules from Korea?

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Responses of U.S. firms to the following question: Does your firm anticipate any negative impact of imports of DRAMs and DRAM modules from Korea?

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