DRAMs OF ONE MEGABIT AND ABOVE FROM THE REPUBLIC OF KOREA

Determination of the Commission in Investigation No. 731-TA-556 (Preliminary) Under the Tariff Act of 1930, Together With the Information Obtained in the Investigation

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UNITED STATES 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Note.--Information that would reveal confidential operations of individual concerns may not be published and therefore has been deleted from this report.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. 731-TA-556 (Preliminary)

DYNAMIC RANDOM ACCESS MEMORIES OF ONE MEGABIT AND ABOVE FROM THE REPUBLIC OF KOREA

Determination

On the basis of the record[1] developed in the subject investigation, the Commission determines, pursuant to section 733(a) of the Tariff Act of 1930 (19 U.S.C. § 1673b(a)), that there is a reasonable indication that an industry in the United States is materially injured by reason of imports from the Republic of Korea (Korea) of dynamic random access memories (DRAMs) of one megabit (Meg) and above,[2] provided for in subheadings 8473.30.40 and 8542.11.00 of the Harmonized Tariff Schedule of the United States, that are alleged to be sold in the United States at less than fair value (LTFV).

Background

On April 22, 1992, a petition was filed with the Commission and the Department of Commerce by Micron Technology, Inc., Boise, ID, alleging that an industry in the United States is materially injured and is threatened with

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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] For purposes of Commerce's investigation, DRAMs include all 1 Meg and above dynamic random access memory semiconductors, whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut dice, and cut dice. Processed wafers produced in Korea but packaged in a third country are included in the scope; however, wafers produced in a third country and assembled or packaged in Korea are not included in the scope. The scope also includes memory modules, such as single in-line processing modules (SIPs) and single in-line memory modules (SIMMs), that contain 1 Meg or above dynamic random access memory semiconductors that are assembled together and function as memory. Modules that contain other parts that are needed to support the function of memory are considered to be covered memory modules. Only those modules containing additional items which alter the function of the module to something other than memory are not-covered modules. The scope also includes video random access memories (VRAMs), as well as any future packaging and assembling of DRAMs.

material injury by reason of LTFV imports of DRAMs of one Meg and above from Korea. Accordingly, effective April 22, 1992, the Commission instituted antidumping investigation No. 731-TA-556 (Preliminary).

Notice of the institution of the Commission's investigation and of a public conference 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 29, 1992 (57 F.R. 18163). The conference was held in Washington, DC, on May 13, 1992, and all persons who requested the opportunity were permitted to appear in person or by counsel.

VIEWS OF THE COMMISSION

Based on the record in this preliminary investigation, we unanimously determine that there is a reasonable indication that an industry in the United States is materially injured by reason of imports of dynamic random access memories of one megabit and above from Korea that are alleged to be sold at less than fair value (LTFV).

I. THE LEGAL STANDARD FOR PRELIMINARY DETERMINATIONS

The legal standard in preliminary antidumping investigations requires the Commission to determine whether, based on the best information available at the time of the preliminary determination, there is a reasonable indication of material injury or threat thereof to a domestic industry by reason of the subject imports. 1/ In this investigation, the Commission considered whether "(1) the record as a whole contains clear and convincing evidence that there is no material injury or threat of such injury; and (2) no likelihood exists that contrary evidence will arise in a final investigation." 2/ The U.S. Court of Appeals for the Federal Circuit has held that this interpretation of the standard "accords with clearly discernible legislative intent and is sufficiently reasonable." 3/

II. LIKE PRODUCT AND DOMESTIC INDUSTRY

In determining whether there is a reasonable indication that an industry in the United States is materially injured or is threatened with material injury by reason of the subject imports, the Commission must first define the

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1/ 19 U.S.C. § 1673b(a). American Lamb Co. v. United States, 785 F.2d 994, 1001 (Fed. Cir. 1986); Calabrian Corporation v. United States International Trade Commission, Slip Op. 92-69 (Ct. Int'l Trade 1991) (citing American Lamb). Whether the establishment of an industry in the United States is materially retarded is not an issue in this investigation.

2/ American Lamb, 785 F.2d at 1001.

3/ Id. at 1004.

"like product" and the "industry." Section 771(4)(A) of the Tariff Act of 1930 (the "Act") defines the relevant industry as the "domestic producers as a whole of a like product, or those producers whose collective output of the like product constitutes a major proportion of the total domestic production of that product . . . ." 4/ In turn, the statute defines "like product" as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation . . . ." 5/

A. Background and Product Descriptions

The Department of Commerce (Commerce) has defined the class or kind of merchandise subject to investigation as:

> one megabit and above dynamic random access memory semiconductors, whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut dies and cut die. Processed wafers produced in Korea but packaged in a third country are included in the scope; however, wafers produced in a third country and assembled or packaged in Korea are not included in the scope. The scope includes memory modules, such as Single In-Line Processing Modules (SIPs) and Single In-Line Memory Modules (SIMMs), that contain one megabit or above dynamic random access memory semiconductors that are assembled together and function as memory. Modules that contain other parts that are needed to support the function of memory are considered to be covered memory modules. Only those modules which contain additional items which alter the function of the module to something other than memory are not-covered [sic] modules. The

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4/ 19 U.S.C. § 1677(4)(A).

5/ 19 U.S.C. § 1677(10). The Commission's determination of what is the appropriate like product or products in an investigation is a factual determination, to which we apply the statutory standard of "like" or "most similar in characteristics and uses" on a case-by-case basis. In defining the like product, the Commission generally considers a number of factors, including: (1) physical characteristics and uses; (2) interchangeability of the products; (3) channels of distribution; (4) customer and producer perceptions of the products; (5) the use of common manufacturing facilities and production employees; and where appropriate, (6) price. Calabrian Corp. v. United States, Slip Op. 92-69 (Ct. Int'l Trade, May 13, 1992); Torrington Co. v. United States, 767 F. Supp. 744 (Ct. Int'l Trade 1990), aff'd. 938 F.2d 1278 (1991); Asociacion Colombiana de Exportadores de Flores, et al. v. United States, 693 F. Supp. 1165, 1168 n.4, 1180 n.7 (Ct. Int'l Trade 1988)(hereinafter Asocoflores).

scope also includes video dynamic random access memory (VRAMs), as well as any future packaging and assembling of DRAMs.

A DRAM is a monolithic integrated memory circuit containing thousands of memory storage cells (bits), each of which contains a transistor and capacitor. 6/ DRAMs vary in density, that is, the number of bits. 7/ The production of DRAMs can be divided into several basic manufacturing operations. 8/ The production of the dice on the silicon wafer, called wafer fabrication, is one of the most difficult and costly of these operations. Following fabrication, each die on the wafer is electrically tested. Defective dice are marked for discard. This stage, known as wafer sorting, is generally performed at the same manufacturing establishment where wafer fabrication takes place. The process of wire bonding and final sealing of the individual die in a case is called assembly, and may take place in the same manufacturing establishment as wafer fabrication, or elsewhere. After assembly, each unit is tested and marked for identification prior to shipment.

B. Like Product Analysis

This investigation raises several issues concerning the definition of the like product. These include: (a) whether assembled and unassembled DRAMs are separate like products; (b) whether DRAMs of different densities are separate like products; (c) whether VRAMs are a separate like product; (d) whether SIPs and SIMMs are separate like products; and (e) whether we should

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6/ Report at A-5.
7/ One kilobit (K) equals 1,024 bits, and one megabit (Meg) equals 1,048,576 bits.
8/ Report at A-6.

define the like product specifically to include or exclude future generation DRAMs. 9/

We address the issue of whether assembled and unassembled DRAMs are separate like products by using a semi-finished product analysis. 10/ The record in this investigation supports the conclusion that assembled and unassembled DRAMs are a single like product. 11/ 12/ DRAM wafers and dice are dedicated to use in assembled DRAMs. They have no independent use other than assembly into finished DRAMs. They embody and impart to finished DRAMs the

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9/ Some of these issues have been addressed by the Commission in 64K Dynamic Random Access Memory Components from Japan, Inv. No. 731-TA-270 (Preliminary) and (Final), USITC Pubs. 1735 and 1862 (August 1985, July 1986)(hereinafter 64K DRAMs Preliminary and 64K DRAMs Final) and Dynamic Random Access Memory Semiconductors of 256 Kilobits and Above from Japan, Inv. No. 731-TA-300 (Preliminary) USITC Pub. 1803 (January 1986)(hereinafter 256K and Above DRAMs). However, as the Court of International Trade has repeatedly held, Commission determinations are sui generis, and the Commission's determination in each investigation "must be based on the particular record at issue including the arguments raised by the parties." Asocoflores, 12 CIT at 638 n.5, 693 F. Supp. at 1169 n.5 (1988) (specifically addressing like product determination); Citrosuco, 12 CIT at 1209, 704 F. Supp. at 1087-88; Armstrong Bros. Tool Co. v. United States, 483 F. Supp. 312, 328-29 (Cust. Ct.), aff'd, 626 F.2d 168 (CCPA 1980).

10/ When considering whether "semifinished" products are "like" the finished product, the Commission has examined: (1) the necessity for, and the costs of, further processing; (2) the degree of interchangeability of articles at the different stages of production; (3) whether the article at an earlier stage of production is dedicated to use in the finished article; (4) whether there are significant independent uses or markets for the finished and unfinished articles; and (5) whether the article at an earlier stage of production embodies or imparts to the finished article an essential characteristic or function. Certain Telephone Systems and Subassemblies Thereof from Japan and Taiwan, Inv. Nos. 731-TA-426 and 428 (Final), USITC Pub. 2237 (Nov. 1989).

11/ The Commission has applied a semi-finished product analysis specifically in the case of DRAMs, and reached the same conclusion, in previous investigations. 64K DRAMs Final at 8-11, 256K and Above DRAMs at 6-9. No party has argued that the Commission should reach a different conclusion in this investigation.

12/ Vice Chairman Brunsdale notes that her determination that assembled and unassembled DRAMs are a single like product differs from her determination in 64K DRAMs Final. This difference results from the inclusion of unassembled DRAMs within the scope of the investigation in this case, whereas they were not included in the scope in 64K DRAMs Final.

essential memory characteristics for which DRAMs are used. There is no independent commercial market for unassembled DRAMs. 13/

Similarly, the record supports the conclusion that DRAMs of different densities are a single like product. 14/ DRAMs, regardless of density, share the same general physical appearance -- they are DRAM dice enclosed in a plastic or ceramic housing, with thin metal leads extending from the housing which allow the DRAM to be plugged into a circuit board. 15/ There is some degree of substitutability among different generations of DRAMs. 16/ Channels of distribution for DRAMs of all densities are the same. They are sold to original equipment manufacturers, distributors, value-added resellers, and brokers. 17/ While some manufacturers have dedicated wafer fabrication lines for different densities, the general manufacturing process and equipment used is the same for all densities of DRAM. 18/

VRAMs are "dualport" DRAMs, used in video graphics display applications. The existence of two data ports allows VRAMs to simultaneously send and

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13/ See Report at A-6.

14/ The Commission has previously reached the same conclusion. 64K DRAMs Final at 6-8, 256K and Above DRAMs at 9-12. The Commission has also determined that "all EPROMs" are a single like product, regardless of density. Erasable Programmable Read Only Memories from Japan, Inv. No. 731-TA-288 (Preliminary), USITC Pub. 1776 (November 1985). No party has presented the Commission with reasons why it should reach a different conclusion in this investigation.

15/ See Report at A-6.

16/ There is evidence on the record that most computers are able to handle at least two generations of DRAMs. Micron Brief at 5. The Commission has found in the past that, as higher density DRAMs are introduced, end use applications are designed to accommodate them. 64K DRAMs Final at 7; 256K and Above DRAMs at 11.

17/ Report at A-12.

18/ Id. at A-6. With regard to customer perceptions, the record indicates that customers buy memory, and view all DRAMs as memory chips. See id. at A-41 (demand for DRAMs is based on the number of bits). Finally, with regard to price, there is evidence that price differentials are a function of memory capacity, and that since higher density chips have more memory, they are naturally priced higher than lower density chips. Micron Brief at 6-7.

receive data from accessed information to a video graphics display. 19/ The information of record in this preliminary investigation indicates that while VRAMs are a special configuration of DRAM, they are based on the same essential technology and manufacturing methods. 20/ For purposes of this preliminary determination, we conclude that VRAMs are part of the like product. 21/

The SIPs and SIMMs included in the scope of Commerce's investigation are essentially circuit boards with DRAMs mounted onto them, which serve as memory modules. 22/ Memory modules are a packaging option increasingly used by manufacturers of electronic equipment, primarily computers, requiring significant memory capacity. 23/ Use of modules allows for relatively easy installation and upgrading of memory capacity by inserting a module rather than individual DRAMs. 24/ The essential characteristics of the modules appear to be defined by the DRAMs mounted on them. Memory modules may be assembled from either domestic or imported DRAMs, or a combination of both, and are usually constructed by soldering or otherwise attaching assembled

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19/ Report at A-6. Information on the record indicates that VRAMs are a specialty DRAM, specifically designed to enhance the video performance of computers and other video devices, that VRAMs operate on the same principles as standard DRAMs, have virtually identical physical appearances, and are sold in the same channels of distribution as standard DRAMs. Micron Brief at 10-11.

20/ Report at A-6 n.13.

21/ In any final investigation, Vice Chairman Brunsdale would find information regarding differences in the production processes for DRAMs and VRAMs and information about the cost and difficulty of converting production facilities from DRAM production to VRAM production or vice versa useful in her consideration of this issue.

22/ Commerce's scope specifically does not include modules containing other semiconductors which change the function of the module to something other than memory. Thus, for instance, a module containing logic chips in addition to memory chips, which functions as the processing unit of a computer, would not appear to be within Commerce's scope definition.

23/ Transcript of the Staff Conference (Tr.) at 118-120, 147.

24/ Report at A-44 - A-45; Tr. at 147-148.

DRAMs to a printed circuit board or other substrate. 25/ We conclude that memory modules are included in the like product for purposes of this preliminary determination. 26/

In this investigation, we determine that the like product is all DRAMs, irrespective of density and whether or not assembled. We further determine, for purposes of the preliminary determination, that the like product includes VRAMs and memory modules. It is not necessary for us here to determine whether all future generations of DRAMs are specifically included in or excluded from the like product. 27/ Whether future products will or will not have characteristics and uses consistent with the definition of the like product cannot be ascertained at this time. The fact that newer, higher density DRAMs are expected to be introduced does not, in our view, warrant treating the like product definition differently here than in other

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25/ Report at A-6, Tr. at 164-65.

26/ Vice Chairman Brunsdale notes that she will consider this issue further in the event of a final investigation. Additional information concerning the value of the DRAMs on a module as a share of the value of the completed module and concerning any technical difficulties involved in module assembly would assist her in this determination.

27/ Chairman Newquist and Commissioner Rohr note that future generations of DRAMs may well be "like" the existing generations. However, it may also be true that the technological obstacles to be overcome in the development of future generation volatile memory chips will require revolutionary developments of design and process technology, rather than the largely evolutionary changes which have occurred in DRAM development thus far. Such revolutionary change could result in a product which might or might not be "like" the DRAMs we have found to be "like" within the meaning of the statute.

Thus, their analysis of the impact of allegedly dumped imports is necessarily focussed on the current activities of the domestic industry. They note that currently, the domestic industry produces DRAMs of 256K, 1 Meg, and 4 Meg in commercial quantities. Report at Appendix C. There is limited production of DRAMs of a density below 256K, and 16 Meg DRAMs are currently available in limited quantities, apparently as samples. Id at A-5 and Appendix C. Commercial introduction of 16 Meg DRAMs is anticipated during 1992. Tr. at 102, 126-127. Petitioner is "actively developing" the 64 Meg DRAM. Report at A-5.

investigations. Our approach does not, therefore, differ from the traditional Commission analysis of like product.

C. Domestic Industry Issues

Several issues concerning the definition of the domestic industry arise in this investigation: (a) whether the Commission should include captive producers in the domestic industry; (b) whether the Commission should include in the domestic industry companies that perform only wafer fabrication or assembly, but not both, in the United States; and (c) whether the Commission should include companies that assemble DRAMs onto memory modules in the domestic industry. 28/

It has been the Commission's consistent practice to include all domestic production, whether toll-produced, captively consumed, or sold in the open market, in the definition of the domestic industry. 29/ 30/ This practice is based on the statutory definition of industry which focusses on production and

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28/ We note that some domestic producers have imported DRAMs from Korea during the period of investigation. Report at A-38 and Table 28. No party has argued that they should be excluded under the related parties provision, 19 U.S.C. § 1677(4)(B). Based on information in the confidential record, we determine that appropriate circumstances do not exist to warrant the exclusion of these producers from the domestic industry.

29/ Many of the U.S. producers of DRAMs also manufacture products that use DRAMs, and thus may be considered "captive producers." Report at A-19, Table 6 (large volumes of intra-company transfers) and A-24 (describing overall establishment operations of DRAM producers). IBM, however, is unique in that it is one of the largest DRAM producers in the world, and its production is intended almost exclusively for its own use. Id. at A-9.

30/ E.g., Certain Brass Sheet and Strip from Brazil, Canada and the Republic of Korea, Inv. Nos. 701-TA-269, 731-TA-311, 312 & 315 (Final), USITC Pub. 1930 (December 1986)(toll production); 64K DRAMs Final at 11 n.18 (captive production). See also, Yuasa-General Battery Corp. v. United States, 661 F. Supp. 1214 (Ct. Int'l Trade 1987)(affirming Commission determination that batteries sold in the replacement and original equipment markets are one like product).

the factors of production. 31/ In accordance with the statutory language, we define the domestic industry to include captive producers of the like product. 32/

The nature of the U.S. activities of the companies that produce DRAMs varies widely. Some perform research on and development of all aspects of DRAM technology, from wafer design and fabrication through assembly and final testing technology, in the United States. Some perform all facets of DRAM production, up to and including production of SIPs and SIMMs. Some do wafer fabrication and wafer sorting in U.S. facilities, and assemble either in the United States or overseas. Some companies import wafers and/or dice from other countries for assembly in the United States. 33/

We have considered the information regarding the overall nature of production-related activities in the United States, including the extent and source of a firm's capital investment, the technical expertise involved in

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31/ In Thermostatically Controlled Appliance Plugs and Internal Probe Thermostats, with regard to captive production the Commission noted that:

> There is no statutory basis for excluding captive production. The statute defines the term "industry" as "the domestic producers as a whole of a like product, [or those producers whose collective output of the like product constitutes a major proportion of the total domestic production.]" 19 U.S.C. § 1677(4)(A). The statute further instructs the Commission, as a general rule, that "[t]he effect of the subsidized or dumped imports shall be assessed in relation to the United States production of a like product..." 19 U.S.C. § 1677(4)(D). Thus, the statute defines industry in terms of production, not in terms of markets, distribution channels, or similar factors.

Thermostatically Controlled Appliance Plugs and Internal Probe Thermostats from Canada, Japan, Malaysia and Taiwan, Inv. Nos. 701-TA-292, 731-400 and 402-404 (Final), USITC Pub. 2152 at 8 and 9 (January 1989) quoting, Industrial Phosphoric Acid from Belgium and Israel, Inv. Nos. 701-TA-285-286 and 731-TA-365-366 (Preliminary), USITC Pub. 1931 at 7, n.20 (1986).

32/ Chairman Newquist, Commissioner Crawford, and Commissioner Nuzum note that the extent to which captive producers may be shielded from head-to-head competition with imports is a condition of trade and competition that is relevant to the Commission's injury and causation analysis.

33/ Report at A-8 - A-10 and Table 1; Tr. at 55.

production activity in the United States, the value added to the product in the United States, employment levels, the quantity and type of parts sourced in the United States, and any other costs and activities in the United States leading directly to production of the like product. 34/ Based on this analysis, for purposes of this preliminary determination, we determine that companies which perform either wafer fabrication or assembly in the United States are included in the domestic industry. 35/

Also presented is the question of whether SIP and SIMM manufacturers who purchase DRAMs from either domestic producers or importers should be included in the domestic industry. Two domestic memory module manufacturers indicated at the staff conference that they purchase most, if not all, of their DRAMs from foreign, and primarily Korean, sources. They testified that their cost of DRAMs ranged between 75 and 82.5 percent of their cost of sales. 36/ One module manufacturer testified that "the DRAM price is very significant," and there is "a very small value added" in the module. 37/

Based on the limited information available in this preliminary investigation, Chairman Newquist, Commissioner Rohr, and Commissioner Nuzum determine that companies that purchase DRAMs on the open market for assembly and sale in memory module form are not part of the domestic industry producing the like product. Modules appear to be a packaging variant, attractive to

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34/ Research and development, wafer fabrication and sorting all require sophisticated technology and extremely high capital investment levels. We note that the domestic content share of the assembled DRAMs sold by the domestic producers varied significantly. Report at A-11, Table 1, and Appendix D.

35/ The Commission has reached the same conclusion in prior investigations. 64K DRAMs Final at 12; 256K and Above DRAMs at 15-16. No party argued that any producers should not be included in the domestic industry based on the nature of their production related activities in the United States.

36/ Tr. at 146 (Messrs. Fearing and Freie).

37/ Id. at 146 (Mr. Freie).

purchasers of DRAMs. It does not appear that memory module manufacture requires significant production activities, significant capital, or significant technical expertise. 38/ In addition, the value added in assembly into memory modules is low in comparison to the cost of the DRAMs. Consequently, they conclude for purposes of this preliminary determination that mere assembly of purchased DRAMs into memory modules is not sufficient production-related activity to include these companies in the domestic industry.

Vice Chairman Brunsdale, Commissioner Crawford, and Commissioner Watson determine that companies that purchase DRAMs on the open market for assembly and sale in memory module form are part of the domestic industry producing the like product. They find that the value added by SIMM and SIP producers may be significant. Furthermore, they note that, as a general proposition in title VII investigations, "the like product determination is the industry determination," 39/ that is, companies that produce the like product constitute the domestic industry. Since they have determined that memory modules are part of the like product, the producers of such modules are part of the domestic industry.

38/ One module manufacturer who appeared at the staff conference differentiated between semiconductor manufacturers and module manufacturers in his testimony, noting that a module is a vehicle to sell semiconductors, identifying module manufacturers as customers of semiconductor manufacturers, and stating that module manufacturers act "as a kind of value added reseller. . . ." Id. at 147 (Mr. Freie). The representative of one Korean producer, Samsung, stated that there is "quite a large cottage industry that makes memory modules." Id. at 145 (Mr. McDonald). The representative of Hyundai noted that his company does not import modules, but uses U.S. "subcontractors" to build the small volume of modules it sells in the U.S. market. Id. (Mr. Katz).

39/ Asocoflores, 693 F. Supp. at 1169.

III. CONDITION OF THE INDUSTRY

In assessing whether there is a reasonable indication of material injury to a domestic industry by reason of allegedly subsidized and dumped imports, the Commission is instructed to consider "all relevant economic factors which have a bearing on the state of the industry in the United States . . . ." 40/ In undertaking that assessment, we consider, among other relevant factors, U.S. consumption, production, shipments, capacity utilization, employment, wages, financial performance, capital investment, and research and development expenses. 41/ 42/ In each investigation, the Commission considers the particular nature of the industry under investigation 43/ in the "context of the business cycle and conditions of competition that are distinctive to the affected industry." 44/

The DRAM industry is characterized by a fairly predictable product life cycle. Since the introduction of the 1 kilobit DRAM in 1970, each succeeding generation has represented a quadrupling of memory capacity. The increased memory capacity of the newer generation DRAM results in fewer units being necessary to satisfy the same demand. As each new generation of DRAM is introduced to the market, costs of production and selling prices tend to be high. However, as production increases during the growth phase of the product cycle, costs and prices decline as producers move along the learning curve, lowering defects and improving yields. In the mature phase of the product cycle, costs are generally lowest, and prices continue to fall. Historically,

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40/ 19 U.S.C. § 1677(7)(C)(iii).
41/ See 19 U.S.C. § 1677(7)(C)(iii).
42/ Commissioner Rohr and Commissioner Nuzum note that no single factor is dispositive in their evaluation of these indicators.
43/ See 19 U.S.C. § 1677(7)(C)(iii). See also H.R. Rep. No. 317, 96th Cong., 1st Sess. 36; S. Rep. No. 249, 96th Cong., 1st Sess. 88.
44/ 19 U.S.C. § 1677(7)(C)(iii).

each new generation has been introduced within three to four years after commercial introduction of the previous generation, during the latter's growth or maturity phase. The competition between succeeding generations also contributes to price declines for the mature DRAM.

Apparent U.S. consumption of DRAMs increased throughout the period of investigation, whether measured in units or bits. 45/ Consumption of DRAMs is driven by the demand from producers of electronic equipment -- primarily computers -- for memory capacity. The parties are in agreement that aggregate U.S. demand for DRAMs is increasing and is projected to continue to do so. 46/ This conclusion is borne out by the substantial increases (measured in bits) in domestic production and U.S. shipments (as well as imports) during the period of investigation.

The record in this preliminary investigation does not contain reliable capacity and capacity utilization data. 47/ The domestic industry's production of DRAMs as reported in units fell from 348 million units in 1989 to 302 million units in 1990, increased to 324 million units in 1991, but declined again to 73 million units in the interim period January-March 1992, as compared with 80 million units in interim 1991. 48/ However, measured in

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45/ Report at A-13, Table 2. We note that, because we lack complete information on imports of DRAMs from sources other than Korea, our consumption data do not fully represent either the level of, or changes in, consumption.
46/ Micron Brief at 14; Respondents' Brief at 12.
47/ Some companies appear to have reported capacity only for wafer fabrication, while reported production included DRAMs assembled from imported dice. In addition, while a producer's production facility may be physically unchanged, capacity as reported in units may appear to decline, due primarily to a shift from lower to higher density DRAMs, which are larger, resulting in fewer units being produced on the same number of wafers. See Report at A-14 - A-17. Thus, our capacity data do not accurately represent the domestic industry, and capacity utilization cannot be calculated. In the event of any final investigation, we will seek more reliable capacity information.
48/ Id. at A-17 and Table 4.

bits, domestic production of DRAMs increased throughout the period of investigation, more than doubling from 162,219 billion bits in 1989 to 391,861 billion bits in 1991, and increased again in interim 1992 to 104,390 billion bits as compared with 84,095 billion bits in interim 1991. 49/

The domestic industry's U.S. shipments measured by quantity declined from 174 million units in 1989 to 153 million units in 1990, increased to 156 million units in 1991, and increased from 42 million units in interim 1991 to 62 million units in interim 1992. 50/ Again, measured in bits, the domestic industry's U.S. shipments increased throughout the period of investigation, nearly tripling from 60,596 billion bits in 1989 to 163,345 billion bits in 1991, and more than doubling from 38,462 billion bits in interim 1991 to 71,706 billion bits in interim 1992. 51/ The discrepancy between production and U.S. shipments measured in units and in bits is accounted for by the shift from lower to higher density DRAMs. 52/

U.S. producers' inventories of assembled DRAMs increased in quantity throughout the period of investigation. 53/ As a ratio to shipments, domestic producers' inventories increased from 1989 to 1990, and declined in interim 1992 as compared with interim 1991. 54/ Inventories of unassembled (uncased) DRAMs fell, in quantity and as a ratio to shipments, before increasing in interim 1992. 55/

49/ Id.
50/ Id. at A-17 - A-20 and Table 6.
51/ Id.
52/ Id. at Appendix C, Tables C-1 - C-4.
53/ Id. at A-20 and Table 9. We note that inventory information does not reconcile with reported production and shipments. Producers cited several reasons for the discrepancies, including scrap and customer returns and recalls.
54/ Id.
55/ Id. at A-20 and Table 9.

The number of production and related workers increased from 1989 to 1990, decreased in 1991, but increased between interim 1991 and interim 1992. 56/ Hourly wages and compensation increased throughout the period of investigation. 57/ Hours worked fell consistently from 1989 to 1991, although an increase was reported in interim 1992 as compared with interim 1991. Productivity declined from 1989 to 1990, increased in 1991, and fell between the interim periods.

DRAM production is capital intensive, and producers must have access to sufficient capital to be able continually to invest large sums in research and development of higher density DRAMs in order to participate in the next generation. Thus, weak operating results are particularly significant in this industry, as they suggest producers lack the resources to fund necessary research and development internally and may have difficulty raising money in capital markets. 58/ As a result, they may be losing the ability to continue to compete effectively.

The financial information concerning the domestic industry in this investigation is confidential. 59/ 60/ However, our review of that

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56/ Id. at A-22 and Table 11.
57/ Id.
58/ Some producers reported to the Commission that they have slowed down or delayed planned research and development and capital expenditures intended for higher density DRAMs. Id. at A-9 - A-10 and Appendix E. Micron's Vice President of Finance and Chief Financial Officer testified at the staff conference that Micron was forced to reduce its credit line in May 1991 because of deteriorating financial condition due to low prices. In addition, rapidly declining DRAM prices reportedly prevented Micron from raising capital through an equity offering earlier this year. Tr. at 23-24 (Mr. Langrill).
59/ Report at A-25 - A-29 and Tables 16-21.
60/ Commissioner Rohr notes that, in the event of any final investigation, he intends to explore the linkages between changes in the cost of goods sold and the introduction of new generation DRAMs, in order to better understand the effects of the product life cycle on the industry's financial performance, especially its operating income. In particular, he is interested in whether

(continued...)

information suggests that the industry is not performing well, particularly as regards the value of net sales, cash flow, operating and net income as a percentage of net sales, returns on assets, capital expenditures, and research and development expenses. 61/62/

IV. REASONABLE INDICATION OF MATERIAL INJURY BY REASON OF ALLEGEDLY LTFV IMPORTS

In determining whether there is a reasonable indication that the domestic industry is materially injured by reason of the imports under investigation, the statute directs the Commission to consider:

> (I) the volume of imports of the merchandise which is the subject of the investigation,
>
> (II) the effect of imports of that merchandise on prices in the United States for like products, and
>
> (III) the impact of imports of such merchandise on domestic producers of like products, but only in the context of production operations within the United States. 63/

In making this determination, the Commission may consider "such other economic factors as are relevant to the determination . . . ." 64/ Although we may consider information that indicates that injury to the industry is caused by factors other than the LTFV imports, we do not weigh causes. 65/

60/(...continued)
the industry's performance during the period of investigation can be considered "normal" in the context of the product life cycle, or if it is worse than would be expected at the current stage of that cycle.

61/ Report at Table 16.

62/ Based on their analysis of the information in the record, Chairman Newquist and Commissioner Rohr conclude that there is a reasonable indication of material injury to the domestic industry.

63/ 19 U.S.C. § 1677(7)(B)(i).

64/ 19 U.S.C. § 1677(7)(B)(ii).

65/ Chairman Newquist, Commissioner Rohr, and Commissioner Nuzum further note that the Commission need not determine that imports are "the principal, a substantial or a significant cause of material injury." S. Rep. No. 249, 96th Cong., 1st Sess. 57 and 74 (1979). Rather, a finding that imports are a cause of material injury is sufficient. See, e.g., Metallverken Nederland, B.V. v.
(continued...)

The subject imports, measured in units and bits, increased significantly during the period of investigation. 66/ The value of those imports also increased from 1989 to 1991, despite a decline between 1989 and 1990, and increased significantly when interim 1991 is compared with interim 1992. 67/ Whether measured in units, bits, or value, subject imports' share of apparent U.S. consumption increased in every period for which data were requested. In units, subject imports' share of apparent U.S. consumption increased from 5.9 percent in 1989 to 10.6 percent in 1990, and again to 21.1 percent in 1991, while data for the interim periods show an increase from 15.1 percent in interim 1991 to 21.3 percent in interim 1992. 68/ Measured in bits, subject imports' market penetration increased from 12.5 percent in 1989 to 24.1 percent in 1991, and increased again to 27.7 percent in interim 1992 as compared with 17.3 percent in interim 1991. By value, subject imports' share of apparent U.S. consumption increased from 9.9 percent in 1989 to 20.4 percent in 1991, and jumped from 14.3 percent in interim 1991 to 29.4 percent in interim 1992. In considering the impact of this level of imports, we recognize that apparent consumption is understated, due to the lack of information on substantial volumes of imports from sources other than Korea. 69/ On the whole, we find that the increasing share of consumption

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65/(...continued)
United States, 728 F. Supp. 730, 741 (Ct. Int'l Trade 1989); Citrosuco Paulista S.A. v. United States, 704 F. Supp. 1075, 1101 (Ct. Int'l Trade 1988).

66/ Report at A-35, A-38 and Table 25. We note that currently, there are imports of 1 Meg, 4 Meg, and 16 Meg DRAMs. Thus, our analysis of the effects of subject imports on the domestic industry necessarily focusses on those products.

67/ Id. at A-38 and Table 25.

68/ Id. at A-40 and Table 29.

69/ On the other hand, the market penetration figures do not include all subject imports. See id. at A-36 - A-38.

accounted for by subject imports is an important factor in our preliminary affirmative determination.

Respondents argue that the declining price trends for 1 Meg and 4 Meg DRAMs are consistent with price trends for previous-generation DRAMs, and are due solely to the product life cycle. Petitioner, while agreeing that price declines are to be expected, argues that the subject imports undersell the domestic product, resulting in price declines in excess of what would be expected in the absence of dumped imports. The evaluation of pricing information in the context of this industry is difficult, because price declines are a normal part of the product life cycle.

The Commission requested price information from U.S. producers and importers for their monthly spot and quarterly contract sales of DRAMs during the period of investigation. 70/ Information was requested for six specifications of 1 and 4 Meg DRAMs, and for sales to original equipment manufacturers, franchise distributors, value-added resellers/aftermarket resellers, and brokers/independent distributors. As would be expected, prices for all products sold to all types of purchasers declined overall during the period of investigation. 71/ However, the percentage declines varied, and import prices declined by a greater percentage in 9 of the 11 instances where both producer and importer price trend series were developed. Some of the differences may be attributable to the different initial price levels and starting dates of the price series for domestic producer and import prices.

70/ All importers reporting prices indicated that all their sales are made on a spot basis, consequently there are no pricing data for import contract sales. Id. at A-45 & n.50, A-46 n.53.

71/ U.S. producers' contract sales to OEMs followed trends similar to those for spot sales to OEMs. Id. at Appendix F.

Respondents argue that Micron entered the 1 Meg and 4 Meg markets late, and at prices below the market, leading prices downward. Thus, respondents argue, any injury due to price declines beyond what would be expected was self-inflicted by Micron, and is not due to allegedly dumped imports. We note that Micron is only one of several significant producers in the domestic industry. Whether Micron's own pricing practices adversely affected its operations may not be a significant factor in determining whether there is a reasonable indication that allegedly dumped imports are materially injuring the domestic industry. 72/ Moreover, the pricing data on the record account for only approximately 31 and 22 percent of domestic production and subject imports, respectively. 73/ In the event of any final investigation, we anticipate that additional pricing information will better enable us to evaluate the question of late entry into specific density markets, and the effects of any such late entry on prices.

Price comparisons were mixed, with both under- and over-selling by imports reported. Due in part to differing qualification requirements, imported and domestic DRAMs may be perceived as more substitutable for one another by some categories of purchasers than others. Overall, however, imported and domestic DRAMs are quite substitutable for one another. 74/ The

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72/ The statute requires us to determine whether there is a reasonable indication of material injury to the domestic industry "as a whole" by reason of imports. 19 U.S.C. § 1677(4)(A); Copperweld Corp. v. United States, 682 F. Supp. 552, 569 (Ct. Int'l Trade 1988); Calabrian Corp. v. United States, Slip Op. 92-69 at 18-19 (Ct. Int'l Trade, May 13, 1992).

73/ Report at A-47.

74/ We note that there is some evidence of differing quality, as evidenced by reported failure rates, and differences in service and supply factors, between domestic and imported DRAMs, which may limit substitutability. They note, however, that these allegations have been directed solely at Micron, and may not apply to the domestic industry as a whole.

Commissioner Rohr does not join in this footnote.

market for DRAMs appears to be relatively price sensitive. Thus, evidence of underselling, particularly in the context of more rapid import price declines, suggests price depression.

Overall, the limited information in this preliminary investigation suggests that allegedly dumped imports from Korea, sold at declining prices and accounting for an increasing share of apparent U.S. consumption, have had an adverse effect on domestic prices and on the sales and revenues of the domestic industry. 75/ The effects of the generational shift on the domestic industry's sales and revenues complicate consideration of the effects of allegedly dumped imports on the industry's financial information. Because the DRAM industry is one in which producers must be able continually to invest large sums in order to bring new generation DRAMs to market, profitability is extremely important to the continued ability of producers to remain viable competitors in the industry.

For all the reasons set forth above, we determine that there is a reasonable indication that the domestic industry producing DRAMs is materially injured by reason of the subject imports from Korea.

75/ Another factor considered by Vice Chairman Brunsdale is the magnitude of the dumping margin, which provides information on how much below a fair level the import price is. The greater the difference between the actual price of the imports and the fair price level, the more likely it is that the domestic industry is being materially injured by unfair imports. In these preliminary investigations, alleged margins for Korean DRAMs range up to 282.51 percent. Report at A-11. While the alleged margins are little more than petitioner's claims, they are the best information currently available concerning the level of the dumping and suggest that the price of imported DRAMs may be significantly below "fair" levels.

INFORMATION OBTAINED IN THE INVESTIGATION

INTRODUCTION

On April 22, 1992, a petition was filed with the U.S. International Trade Commission (Commission) and the U.S. Department of Commerce (Commerce) by counsel on behalf of Micron Technology, Inc. (Micron), Boise, ID, alleging that an industry in the United States is being materially injured and is threatened with further material injury by reason of imports from the Republic of Korea (Korea) of dynamic random access memories (DRAMs) of 1 megabit (Meg)[1] and above[2] that are allegedly sold in the United States at less than fair value (LTFV). Accordingly, effective April 22, 1992, the Commission instituted antidumping investigation No. 731-TA-556 (Preliminary) under section 733(a) of the Tariff Act of 1930 to determine whether there is a reasonable indication that 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 imports of such merchandise into the United States.

Notice of the institution of this investigation was posted in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and published in the Federal Register of April 29, 1992 (57 F.R. 18163). Commerce published its notice of initiation in the Federal Register of May 19, 1992 (57 F.R. 21231). Copies of the Commission's and Commerce's Federal Register notices are presented in appendix A.

The Commission held a public conference in Washington, DC, on May 13, 1992, at which time all interested parties were allowed to present information and data for consideration by the Commission. A list of the participants in the conference is presented in appendix B. The Commission voted on this investigation on June 3, 1992. The statute directs the

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[1] 1 Meg equals 1,048,576 bits.

[2] For purposes of Commerce's investigation, DRAMs include all 1 Meg and above dynamic random access memory semiconductors, whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut dice, and cut dice. Processed wafers produced in Korea but packaged in a third country are included in the scope; however, wafers produced in a third country and assembled or packaged in Korea are not included in the scope. The scope also includes memory modules, such as single in-line processing modules (SIPs) and single in-line memory modules (SIMMs), that contain 1 Meg or above dynamic random access memory semiconductors that are assembled together and function as memory. Modules that contain other parts that are needed to support the function of memory are considered to be covered memory modules. Only those modules containing additional items that alter the function of the module to something other than memory are not-covered modules. The scope also includes video random access memories (VRAMs), as well as any future packaging and assembling of DRAMs.

The subject product is currently covered by statistical reporting numbers 8473.30.4000, 8542.11.0001, 8542.11.0024, 8542.11.0026, and 8542.11.0034 of the Harmonized Tariff Schedule of the United States (HTS) Annotated for statistical reporting purposes. Prior to 1991, the subject product was covered by statistical reporting numbers 8473.30.4000, 8542.11.0035, and 8542.11.0002 of the HTS Annotated.

Commission to make its preliminary determination within 45 days after receipt of the petition, or in this investigation by June 8, 1992.

PREVIOUS AND RELATED COMMISSION INVESTIGATIONS

The Commission has conducted two previous antidumping investigations concerning DRAMs. The first investigation,[3] filed by Micron on June 24, 1985, covered imports from Japan of assembled 64 kilobit (K)[4] DRAMs of the N-channel metal oxide semiconductor (NMOS) type and resulted in an affirmative final determination by the Commission. The second investigation,[5] self-initiated by Commerce on December 11, 1985, covered imports from Japan of 256K and above DRAMs of both the NMOS and the complementary metal oxide semiconductor (CMOS) type, whether in the form of processed wafers, unmounted dice, mounted dice, or assembled devices. The investigation was suspended following an agreement entered into by Commerce with the respondents on August 1, 1986. The agreement called for Japanese producers/exporters to revise their U.S. prices to eliminate sales of DRAMs of 256K and above at LTFV.[6]

On March 10, 1986, the Commission instituted an investigation of unfair trade practices[7] concerning the importation into the United States of certain DRAMs, components thereof, and products containing the same, or in their sale, by reason of alleged direct, contributory, and induced infringement of certain claims of 10 U.S. patents, the effect or tendency of which is to destroy or substantially injure an industry that is efficiently and economically operated in the United States. The complaint, filed by Texas Instruments, Inc. (TI), named as respondents Japanese and Korean manufacturers and Japanese, Korean, and U.S. importers of DRAMs. The Commission found a violation of section 337, and a limited exclusion order was issued in September 1987. Following the President's disapproval of the limited exclusion order, the Commission issued a modified limited exclusion order in December 1987, which remains in effect. Complainant TI appealed from the portion of the Commission's determination finding no violation of section 337 with respect to one patent. On appeal, the Court of Appeals for the Federal Circuit reversed and remanded. Following remand proceedings, the Commission found a violation of section 337, and issued a second limited exclusion order in February 1990.

On May 3, 1990, the Commission instituted an investigation of unfair trade practices[8] concerning the importation into the United States of certain DRAMs, static random access memories (SRAMs), components thereof, and products containing the same, or in their sale, by reason of alleged infringement of certain claims of eight U.S. patents. The complaint, filed by SGS-Thompson

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[3] U.S. International Trade Commission, 64K Dynamic Random Access Memory Components From Japan (inv. No. 731-TA-270), USITC Pub. 1862, June 1986.

[4] One K equals 1,024 bits.

[5] USITC, Dynamic Random Access Memory Semiconductors of 256 Kilobits and Above From Japan (inv. No. 731-TA-300).

[6] The agreement also addressed pricing of EPROMs, which were also the subject of an ongoing antidumping investigation, and various other issues, including market access in Japan.

[7] Inv. No. 337-TA-242.

[8] Inv. No. 337-TA-312.

Microelectronics, Inc., named a Korean manufacturer and its U.S. subsidiary as respondents. On August 29, 1990, the Commission terminated the investigation on the basis of a settlement agreement.

THE PRODUCT

Description and Uses

A 1 Meg DRAM is a monolithic integrated circuit with 1,048,576 storage cells (bits), each of which contains a miniature transistor and capacitor. The 1 Meg DRAM is one of a series of DRAMs produced with increasing densities since the 1K DRAM was first introduced in 1970. Following the introduction of 4K and 16K DRAMs during the 1970s and 64K and 256K DRAMs during the early 1980s, the 1 Meg DRAM was first offered for sale in limited quantities in 1985. In 1989, DRAMs with a density of 4 Megs (4,194,304 bits) began to be commercialized, and the development of a 16 Meg (16,777,216 bits) device has reportedly reached prototype sampling. In addition, the petitioner indicates that it "is actively developing the 64 Meg DRAM generation."

Information is stored in each DRAM cell as an electrical charge (voltage) impressed on the capacitor, which is connected to one of the transistor elements. Storage requires two different levels of energy--one to represent the binary digit "0" and another to represent the binary digit "1." The storage cells in the DRAMs are arranged in a rectangular matrix of columns and rows, thus allowing each cell to be accessed independently (random access). 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 or data line. 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. DRAMs sold in the U.S. market are largely designed with access times ranging from 50ns to 100ns.

The information stored on cell capacitors must be regenerated after each address (read sequence), since the charge is attenuated by the sharing of the cell capacitance with the capacitance of the data line. The charge is also attenuated by leakage across the cell capacitor plates. Because of the leakage, the energy on the cell capacitors is constantly sampled and maintained at a predetermined charge level by "threshold" amplifiers. A threshold amplifier is required to maintain the charge level on the cell capacitors connected to each data line. The required regeneration of the charge on cell capacitors makes the device "dynamic."[9]

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[9] SRAMs, other random access memory devices not included in Commerce's scope of the investigation, do not require sampling and refresh charges, but are more costly to produce because tight cell densities are more difficult to achieve.

Other items included in the scope of Commerce's investigation are memory modules containing DRAMs of 1 Meg and above and VRAMs.[10] A memory module is a packaging arrangement consisting of a printed circuit board containing two or more DRAMs.[11] The most common types of memory modules are SIPs, SIMMs, and memory cards. VRAMs, i.e., dualport[12] DRAMs, are used in video graphics display applications.

Manufacturing Process

DRAMs are produced in large numbers on a single silicon wafer; each of the uncased DRAMs is called a chip or a die. The process needed to produce the chips includes repeated photolithographic steps and the controlled introduction of impurity atoms (dopants) into the silicon crystal. After production and separation (including testing of the dice), the good chips are usually wire bonded or otherwise connected to lead frames and encapsulated for installation into memory modules or other circuits.

The production of DRAMs can be divided into four separate operations. The production of the chips on the wafer, called wafer fabrication, is one of the most difficult and costly operations. Following fabrication, each die on the wafer is electrically tested and defective dice are marked. This stage, known as wafer sorting, is generally conducted where wafer fabrication is performed. The process of wire bonding and encapsulation/final sealing (or installation into a plastic or ceramic case) is called assembly. Assembly operations are often labor intensive and, for some producers, occur in developing countries. The final operations include testing and marking.[13] Memory modules are usually constructed by soldering or otherwise attaching assembled DRAMs to a printed circuit board or other substrate. Memory modules are produced by both DRAM producers and manufacturers who purchase DRAMs from these DRAM producers.

DRAMs and memory modules imported into the United States from Korea are essentially interchangeable with those produced by U.S. firms. The devices are dual in-line packages (a single DRAM) or memory modules (containing multiple DRAMs) that are lead-to-lead compatible; lead spacings and encapsulation are standard. The largest uses for 1 Meg and above DRAMs and memory modules that use these devices are in automated data processing and telecommunications equipment where digital information storage is needed. Memory modules usually provide more capacity and versatility than dual in-line packages in expanding the size of this storage.

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[10] Also included in Commerce's scope of the investigation are unassembled DRAMs of 1 Meg and above, including processed wafers, uncut dice, and cut dice.

[11] Memory modules may also contain other parts. If those other parts change the function of the module to something other than memory, they are excluded from the scope of Commerce's investigation.

[12] Two data ports are used to simultaneously send and receive data from accessed information to a video graphics display.

[13] *** the manufacturing process for VRAMs is essentially the same as that for DRAMs. ***.

U.S. Tariff Treatment

The U.S. Customs Service has determined that, for tariff and marking purposes, the country of origin of imported DRAMs is the location of assembly rather than the location of wafer fabrication. Under Customs regulations in the European Community (EC) and Japan, the country of origin is determined by the location of the wafer fabrication.

Imports of DRAMs are classified in HTS subheading 8542.11.00. This tariff subheading provides for digital monolithic integrated circuits, including metal oxide semiconductor (MOS) memory devices made of silicon.[14] Since 1991, DRAMs of 1 Meg and above have 3 separate 10 digit statistical annotations. Uncased or unassembled DRAMs are covered by statistical reporting number 8542.11.0001, along with all uncased digital monolithic integrated circuits made of silicon. Cased or assembled DRAMs with a density of 1 Meg are counted under statistical reporting number 8542.11.0024 (over 300,000 but not over 3,000,000 bits), and cased or assembled DRAMs with a density above 3,000,000 bits are reported under statistical reporting numbers 8542.11.0026 (over 3,000,000 but not over 15,000,000 bits) and 8542.11.0034 (over 15,000,000 bits). Memory modules are classified in HTS subheading 8473.30.40. This subheading provides for parts and accessories (other than carrying cases and the like and those incorporating a cathode ray tube) suitable for use solely or principally with automatic data processing machines and units of HTS heading 8471 (see U.S. Customs Service ruling HQ 087791 of February 1, 1991).[15]

During the period covered in this investigation, U.S. imports of 1 Meg and above DRAMs, provided for in HTS subheading 8542.11.00, as well as memory modules, provided for in HTS subheading 8473.30.40, entered free under the column 1-general or most-favored-nation rate of duty.

THE NATURE AND EXTENT OF ALLEGED SALES AT LTFV

Petitioner based U.S. price (USP) on observed price quotes of DRAMs by distributors in the United States. Deductions were made from USP for the distributors' markup and movement expenses. To demonstrate home market price, petitioner supplied average home market prices obtained by Dataquest and company-specific home market price quotes obtained by an unidentified firm. Petitioner calculated the cost of production (COP) for each Korean company's 1 Meg and 4 Meg DRAMs based on a cost model developed by a research firm using company-specific data for die size, number of masking steps, and yields. The

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[14] By virtue of HTS general rule of interpretation 2(a), the subheading covers such goods whether incomplete or unfinished, complete or finished, and assembled or unassembled.

[15] Some types of memory modules may also be classified in HTS subheading 8548.00.00, which provides for electrical parts of machinery or apparatus, not specified or included elsewhere in chapter 85 of the HTS. Although this HTS subheading was not provided in Commerce's scope of the investigation, Commerce's written description is dispositive. During the period for which data were requested in this investigation, memory modules provided for in HTS subheading 8548.00.00 were subject to a 3.5-percent ad valorem tariff.

statutory 8-percent profit was added to the COP in estimating constructed value (CV).

Petitioner alleges that sales of DRAMs by Goldstar Electron Co., Ltd. (Goldstar), Hyundai Electronics Industries Co., Ltd. (Hyundai), and Samsung Electronics Co., Ltd. (Samsung) in Korea are at prices below their COP and are therefore inadequate bases for calculating the foreign market value (FMV). Petitioner calculated FMV on the basis of CV. Based on a comparison of USP to CV, petitioner alleges the following range of dumping margins for each of the three Korean producers' 1 Meg and 4 Meg DRAMs (in percent):

	1 Meg DRAMs:		4 Meg DRAMs:	
Firm	Low	High	Low	High
Goldstar.....	132.11	165.29	273.25	273.25
Hyundai.....	94.29	170.89	278.63	282.51
Samsung.....	0.62	3.83	93.18	97.39

THE U.S. MARKET

U.S. Producers

U.S. producers of uncased DRAMs perform wafer fabrication (and wafer sorting) in the United States and assembly (and final unit testing) in the United States or in foreign countries, whereas U.S. producers of cased DRAMs perform wafer fabrication (and wafer sorting) either in the United States or offshore and conduct assembly operations in the United States. The Commission sent producers' questionnaires requesting data on DRAM operations to eight firms listed in the petition as producers of DRAMs and to three firms believed to be importing the subject product into the United States. The Commission also sent producers' questionnaires to 19 firms identified as participants in the U.S. DRAM market by industrial directories. Fourteen firms responded that they did not produce DRAMs in the United States and five firms did not respond to the Commission's request for information. Eleven firms indicated that they performed wafer fabrication and/or assembly and testing in the United States during all or part of the period for which information was requested; however, complete or partially complete responses were received from only 9 of the 11 firms. Of the 11 known producers of DRAMs, 7 firms performed wafer fabrication in the United States, 5 of which also generally performed some assembly operations in the United States,[16] and 4 firms performed only assembly in the United States. U.S. production data presented in this report are believed to account for virtually all wafer fabrication currently performed in the United States. Each of the firms and the nature of its operations relating to the production of DRAMs are discussed below.

[16] Included is ***, which during the period for which information was requested performed ***.

Fujitsu Microelectronics, Inc. (Fujitsu)

Fujitsu is wholly owned by Fujitsu Ltd. in Japan, with DRAM manufacturing facilities in the United States, Japan, the United Kingdom, ***, and ***. In the United States, Fujitsu DRAM wafers are fabricated in Oregon and assembled in San Diego or ***. Fujitsu also owns entities in *** that are engaged in ***. Fujitsu reported ***. ***.

Hitachi, Semiconductor (America), Inc. (Hitachi)

Hitachi is owned by Hitachi Ltd. in Japan. The firm maintains DRAM manufacturing facilities in the United States and Japan and is engaged in ***. In the United States, wafers are fabricated in Texas and assembled ***. *** reported by Hitachi consist primarily of *** from ***. ***.

International Business Machines Corp. (IBM)

IBM maintains DRAM *** facilities in Vermont. The firm's DRAM production is dedicated to primarily internal use. IBM's wholly-owned DRAM manufacturing facilities are located in the United States, ***, ***, and ***. The IBM foreign affiliates primarily produce ***; however, IBM officials indicate ***. In addition, the firm indicated that it ***. ***.

Matsushita Semiconductor Corp. of America (Matsushita)

Matsushita is a wholly-owned subsidiary of Matsushita Electronics Corp. in Japan, with DRAM wafer fabrication facilities in ***. *** reported by Matsushita consist of ***. Assembly/test operations of *** DRAMs began in *** on ***.

Micron Technology, Inc. (Micron)

Micron, the petitioner, performs DRAM wafer fabrication and assembly/test activities in Idaho. The firm accounted for *** percent of total DRAM shipments made by U.S. producers of DRAMs[17] in 1991. The petitioner indicated that it also owns an assembly/test facility in ***. ***.

Mitsubishi Semiconductor America, Inc. (Mitsubishi)

Mitsubishi is wholly owned by Mitsubishi Electric Corp. in Japan. The firm reported DRAM manufacturing facilities in the United States and Japan and

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[17] Included in the calculation are shipments of uncased and cased DRAMs produced by U.S. fabrication and assembly/test facilities. Total U.S. DRAM shipments may include products fabricated or assembled and tested outside the United States and may be overstated to the extent that double counting may have occurred by firms responding to the Commission's questionnaire.

indicated that it maintains an affiliate involved in ***. In the United States, DRAMs are ***. ***.

Motorola Inc. (Motorola)

Motorola is the sole owner of DRAM manufacturing facilities in the United States, the United Kingdom, ***, and ***. In addition, the firm has a joint venture with Toshiba in a wafer fabrication facility in Japan. Motorola indicated that in the period for which information was requested, it fabricated wafers in *** and maintained assembly/test facilities in ***. In addition, the firm indicated that there were ***. ***. ***.

NEC Electronics, Inc. (NEC)

NEC is wholly owned by NEC Corp. in Japan. NEC Corp. maintains a wafer fabrication and assembly/test facilities in Japan and ***. In the United States, NEC reported wafer fabrication and assembly/testing of *** DRAMs in the period for which information was requested. ***.

Oki Semiconductor Operations Group (Oki)

Although the firm did not respond to the Commission's request for information, *** indicated that Oki performs only assembly/test operations in the United States. ***.[18]

Texas Instruments (TI)

TI wholly owns DRAM manufacturing facilities in the United States, Japan, Italy, and Singapore and jointly owns manufacturing facilities in Taiwan, Singapore, and Japan. The firm also maintains affiliates in Singapore, Italy, and Japan that are involved in ***. Wafer fabrication is performed in *** and assembly/test operations are performed primarily in ***. ***. ***.

Toshiba America Inc. (Toshiba)

Toshiba is wholly owned by Toshiba Corp. in Japan. The firm has a wafer fabrication facility in *** and assembly/test operations in ***. ***.

Presented in table 1 are the 11 U.S. DRAM producers mentioned above, their position on the petition, estimated share of aggregate 1991 U.S. producers' shipments of DRAMs, locations of their U.S. production facilities, and the production operations they perform in the United States.

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[18] Telephone conversation with ***.

Table 1
DRAMs: U.S. producers, position on the petition, shares of reported U.S. producers' shipments in 1991, U.S. production locations, and U.S. production activity

Firm	Position	Share of total DRAM shipments[1]	U.S. production location(s)	U.S. production activity[2]
		Percent		
Fujitsu.....	***	***	Gresham, OR	Fab
			San Diego, CA	A/T
Hitachi.....	***	***	Irving, TX	***
IBM.....	***	***	***, VT	***
Matsushita..	***	***	Puyallup, WA	***
Micron.....	Petitioner	***	Boise, ID	Fab & A/T
Mitsubishi..	***	***	Durham, NC	***
Motorola....	***	***	Austin, TX	***
			Mesa, AZ	***
NEC.....	Supports	***	Roseville, CA	***
Oki.....	***	***	***	***
TI.....	Supports	***	Dallas, TX	***
Toshiba.....	***	***	***	***
Total...		100.0		

[1] The ratios presented are calculated based on total cased and uncased DRAM shipments by U.S. fabrication and assembly/test facilities in 1991. Note that total cased and uncased DRAM shipments may include products fabricated or assembled and tested outside the United States and may be overstated to the extent that doublecounting may have occurred by firms responding to the Commission's questionnaire.

[2] "Fab" indicates that the firm performs wafer fabrication in the United States and "A/T" indicates that the firm performs assembly and testing in the United States.

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

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

U.S. Importers

The petitioner identified three firms as possible importers of DRAMs from Korea, all of which are U.S. subsidiaries of Korean DRAM producers. The Commission sent importers' questionnaires to these three firms and to the eight firms identified by the petitioner as U.S. DRAM producers. The Commission also sent importers' questionnaires to 19 additional firms identified by *** as the importers of record for at least $1 million of imported DRAMs each year.

Four firms responded that they did not import DRAMs and seven firms did not respond to the Commission's request for information. Nineteen firms indicated that they imported DRAMs into the United States during the period

for which information was requested; however, usable import data were received from only 13 firms. Of the latter 13 importing firms, 6 reported imports from Korea and 9 reported imports from sources other than Korea.[19] In addition, ***. ***. Import data provided in the questionnaire responses are estimated to account for *** percent of U.S. imports from Korea in 1991 and *** of U.S. imports from countries other than Korea in the same period.

Channels of Distribution[20]

Both imported and Korean DRAMs are sold to a variety of customers, including original equipment manufacturers (OEMs), franchise distributors, value-added/aftermarket resellers, and brokers/independent distributors. Sales of both are made to unrelated and related customers. According to questionnaire responses, in 1991, *** percent of U.S. producers' shipments were made to OEMs, with *** percent of these being made to related OEMs and *** percent being made to unrelated OEMs. During that time, U.S. producers shipped about *** percent to related distributors and *** percent to unrelated distributors.

Importers of the Korean product shipped *** percent to OEMs and *** percent to distributors in 1991. Of those shipments to OEMs, *** percent went to related OEMs and *** percent went to unrelated OEMs. During that time, *** percent of shipments were made to distributors with *** going to unrelated distributors.

Apparent U.S. Consumption

Data on apparent U.S. consumption of DRAMs are presented in table 2. These data are based on U.S. shipments of cased DRAMs by U.S. producers and importers. See appendix C for a presentation of apparent U.S. consumption by densities.

The quantity of apparent U.S. consumption of DRAMs of 1 Meg and above, in units and bits,[21] increased in every period for which data were requested. Likewise, the quantity of apparent U.S. consumption of all DRAMS, in units and bits, increased in all periods, despite an overall decline reported in units for U.S. producers' U.S. shipments of all DRAMs from 1989 to 1991.

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[19] Imports from countries other than Korea consist of imports from Japan, Taiwan, the United Kingdom, and Germany.

[20] Separate channels of distribution data were not collected for value-added/aftermarket resellers. For additional information concerning channels of distribution and other factors affecting demand, see the section of this report entitled "Pricing and Marketing Considerations."

[21] Because demand for DRAMs is often measured by the amount of memory contained, quantities in bits, as well as units, are presented throughout this report, when available.

Table 2
DRAMs, cased: U.S. producers' U.S. shipments, U.S. shipments of imports, and apparent U.S. consumption, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March- 1991	1992
	Quantity (1,000 units)				
1 Meg and above DRAMs:					
Producers' U.S. shipments..	20,246	81,756	127,983	31,464	56,413
U.S. shipments of imports..	***	***	***	***	***
Apparent U.S. consumption.....	***	***	***	***	***
All DRAMs:					
Producers' U.S. shipments..	173,806	153,144	155,963	42,498	62,173
U.S. shipments of imports..	***	***	***	***	***
Apparent U.S. consumption.....	***	***	***	***	***
	Quantity (billion bits)				
1 Meg and above DRAMs:					
Producers' U.S. shipments..	21,230	89,700	156,154	35,623	70,203
U.S. shipments of imports..	***	***	***	***	***
Apparent U.S. consumption.....	***	***	***	***	***
All DRAMs:					
Producers' U.S. shipments..	60,596	108,011	163,345	38,462	71,706
U.S. shipments of imports..	***	***	***	***	***
Apparent U.S. consumption.....	***	***	***	***	***
	Value (1,000 dollars)				
1 Meg and above DRAMs:					
Producers' U.S. shipments..	237,591	460,051	616,443	148,340	137,268
U.S. shipments of imports..	***	***	***	***	***
Apparent U.S. consumption.....	***	***	***	***	***
All DRAMs:					
Producers' U.S. shipments..	792,865	606,554	665,854	167,809	145,020
U.S. shipments of imports..	***	***	***	***	***
Apparent U.S. consumption.....	***	***	***	***	***
	Average bit value (millicents)[2]				
1 Meg and above DRAMs:					
Producers' U.S. shipments..	1.12	0.51	0.39	0.42	0.20
U.S. shipments of imports..	***	***	***	***	***
Apparent U.S. consumption.....	***	***	***	***	***
All DRAMs:					
Producers' U.S. shipments..	1.31	.56	.41	.44	.20
U.S. shipments of imports..	***	***	***	***	***
Apparent U.S. consumption.....	***	***	***	***	***

[1] The data presented are from eight U.S. producers of DRAMs and are estimated to account for *** U.S. shipments in all periods. The data presented by U.S. importers are estimated to account for *** percent of U.S. DRAM imports from Korea in 1991 and for *** of U.S. DRAM imports from all other countries in the same period.

[2] Average bit values are presented because these values are less affected by changes in product mix than are unit values. Bit values are calculated from unrounded figures.

Note.--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.

U.S. apparent consumption of DRAMs of 1 Meg and above, in terms of value, increased irregularly from 1989 to 1991, despite a decline in the total value of U.S. shipments of imports in the same period. In comparing January-March 1991 with January-March 1992, an increase was reported in apparent U.S. consumption, due to an increase in the total value of U.S. shipments of imports. U.S. apparent consumption of all DRAMs, in terms of value, fell irregularly from 1989 to 1991, but increased in the January-March periods, despite a decline in U.S. producers' U.S. shipments.

Average bit values[22] fell for DRAMs of 1 Meg and above and for all DRAMs in every period for which data were requested. In all instances the average bit value was lower for U.S. producers' U.S. shipments than for U.S. shipments of imports.

CONSIDERATION OF ALLEGED MATERIAL INJURY

The information presented in this section of the report is based on responses to Commission questionnaires. Of the 11 known U.S. producers of DRAMs, eight provided complete responses to the Commission's request for data. As mentioned earlier in this report, *** of the eight firms providing usable trade data perform wafer fabrication in the United States, *** of which also generally perform some, but not necessarily all, assembly operations in the United States. The firms providing trade data that perform solely assembly/test operations in the United States are ***. *** did not provide complete trade data. The remaining unresponsive U.S. producers are ***. These firms maintain *** facilities in the United States. Data presented by U.S. producers are believed to account for *** wafer fabrication currently performed in the United States. See table 1 and the section of this report entitled "U.S. Producers" for a description of the nature of each firm's U.S. operation.

U.S. Capacity[23] and Production

Capacity and production data, as reported by U.S. DRAM producers, are presented by firms in tables 3 and 4. See appendix C for production data by firms and densities. Capacity utilization data are not presented because of the possibility of erroneous reporting by reason of the nature of each firm's operations and because insufficient data were received on the origin of the DRAMs encased in the United States. In particular, for ***, it appears that capacity is reported for wafer fabrication only, whereas production data may also include the asembly and testing of imported uncased DRAMs. In addition, doublecounting may have occurred in the production data reported for ***. For ***, it appears that the capacity data reported is for their assembly/test operations performed on uncased DRAMs produced by ***.

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[22] Average bit values are presented throughout this report, when available, because these values are less affected by changes in product mix than are average unit values.

[23] The "capacity" data requested in the Commission's questionnaire consisted of firms' "full production capability" to produce DRAMs, based on the maximum level of production that their establishment could reasonably expect to attain under normal operating conditions.

Table 3
DRAMs of 1 Meg and above: U.S. producers' average capacity[1] and production, 1989-91, January-March 1991, and January-March 1992[2]

Item	1989	1990	1991	January-March-- 1991	1992
	Average capacity (1,000 units)				
Fujitsu	***	***	***	***	***
Hitachi	***	***	***	***	***
IBM	***	***	***	***	***
Matsushita	***	***	***	***	***
Micron	***	***	***	***	***
Mitsubishi	***	***	***	***	***
NEC	***	***	***	***	***
TI	***	***	***	***	***
Total	85,871	152,908	219,608	50,395	56,222
	Production (1,000 units)[3]				
Fujitsu	***	***	***	***	***
Hitachi	***	***	***	***	***
IBM	***	***	***	***	***
Matsushita	***	***	***	***	***
Micron	***	***	***	***	***
Mitsubishi	***	***	***	***	***
NEC	***	***	***	***	***
TI	***	***	***	***	***
Total	91,567	184,592	279,118	65,535	68,634
	Production (billion bits)				
Fujitsu	***	***	***	***	***
Hitachi	***	***	***	***	***
IBM	***	***	***	***	***
Matsushita	***	***	***	***	***
Micron	***	***	***	***	***
Mitsubishi	***	***	***	***	***
NEC	***	***	***	***	***
TI	***	***	***	***	***
Total	96,795	218,085	380,383	80,431	103,179

[1] U.S. producers reported capacity on the basis of ***-hour work weeks, operating *** weeks per year.

[2] Of the 11 known U.S. producers, 8 reported capacity and production data as presented. *** did not provide the Commission with usable data. The total production data presented are for cased and uncased DRAMs produced by U.S. fabrication and assembly/test facilities. The capacity data appear to be for wafer fabrication in all instances, with the exception of ***, which perform U.S. assembly/test operations only. For ***, it appears that capacity may be just for wafer fabrication, whereas production figures may also include the assembly and testing of *** uncased DRAMs. In addition, doublecounting may have occurred in the production data reported for ***. Note that the production totals may include products fabricated or assembled and tested outside the United States. See table 1 and the section of this report entitled "U.S. Producers" for the nature of each firm's U.S. operations. Also see the text accompanying this table for further explanations of the data presented.

[3] Production does not reconcile with shipments and inventories. Firms cited "rounding errors, scrap, cycle count adjustment, customer returns and recalls, and misidentification of the product" as reasons for the discrepancies.

Note.--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 4
All DRAMs: U.S. producers' average capacity[1] and production, 1989-91, January-March 1991, and January-March 1992[2]

Item	1989	1990	1991	January-March-- 1991	1992
	Average capacity (1,000 units)				
Fujitsu	***	***	***	***	***
Hitachi	***	***	***	***	***
IBM	***	***	***	***	***
Matsushita	***	***	***	***	***
Micron	***	***	***	***	***
Mitsubishi	***	***	***	***	***
NEC	***	***	***	***	***
TI	***	***	***	***	***
Total	264,826	233,896	229,295	56,055	57,380
	Production (1,000 units)[3]				
Fujitsu	***	***	***	***	***
Hitachi	***	***	***	***	***
IBM	***	***	***	***	***
Matsushita	***	***	***	***	***
Micron	***	***	***	***	***
Mitsubishi	***	***	***	***	***
NEC	***	***	***	***	***
TI	***	***	***	***	***
Total	348,141	301,776	323,630	80,026	73,254
	Production (billion bits)				
Fujitsu	***	***	***	***	***
Hitachi	***	***	***	***	***
IBM	***	***	***	***	***
Matsushita	***	***	***	***	***
Micron	***	***	***	***	***
Mitsubishi	***	***	***	***	***
NEC	***	***	***	***	***
TI	***	***	***	***	***
Total	162,219	247,883	391,861	84,095	104,390

[1] U.S. producers reported capacity on the basis of ***-hour work weeks, operating *** weeks per year.

[2] Of the 11 known U.S. producers, 8 reported capacity and production data as presented. *** did not provide the Commission with usable data. The total production data presented are for cased and uncased DRAMs produced by U.S. fabrication and assembly/test facilities. The capacity data appear to be for wafer fabrication in all instances, with the exception of ***, which perform U.S. assembly/test operations only. For ***, it appears that capacity may be just for wafer fabrication, whereas production figures may also include the assembly and testing of *** uncased DRAMs. In addition, doublecounting may have occurred in the production data reported for ***. Note that the production totals may include products fabricated or assembled and tested outside the United States. See table 1 and the section of this report entitled "U.S. Producers" for the nature of each firm's U.S. operations. Also see the text accompanying this table for further explanations of the data presented.

[3] Production does not reconcile with shipments and inventories. Firms cited "rounding errors, scrap, cycle count adjustment, customer returns and recalls, and misidentification of the product" as reasons for the discrepancies.

Note.--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.

Capacity data, as presented, were reported in terms of units of DRAMs. The reader should note that although a producer's physical production facility may remain substantially unchanged, capacity, as reported in DRAM units, or dice, may appear to decline. This is primarily the result of a shift from the production of lower density to higher density DRAMs on the same production line. That is, as producers shift production and capacity from lower density to higher density DRAMs, the same amount of wafer capacity will result in a decline in the unit capacity because higher density dice are physically larger and fewer can be produced on the same size wafer.[24]

As reported, *** U.S. producers' capacity to produce DRAMs of 1 Meg and above, ***, generally increased during the period for which information was requested. U.S. producers' capacity to produce all DRAMs generally increased for *** from 1989 to 1991 and increased for *** when comparing the periods January-March 1991 to January-March 1992.

Total U.S. production of DRAMs of 1 Meg and above, as reported in units and bits, increased between all periods for which information was requested. ***.

Total U.S. production of all DRAMs, as reported in units, fell in 1990 and increased in 1991 to a level below that achieved in 1989. ***. In comparing the first quarters of 1991 and 1992, total U.S. production (in units) fell. ***. Total U.S. production of all DRAMs, as reported in bits, increased in all periods, ***.

U.S. Producers' Shipments

U.S. producers' shipments of cased DRAMs of 1 Meg and above and all cased DRAMs are presented in tables 5 and 6. See appendix C for a presentation of U.S. producers' shipments of cased DRAMs by densities.

As reported, U.S. producers' shipments of cased DRAMs of 1 Meg and above increased, by quantity and value, from 1989 to 1991. For the periods January-March 1991 and January-March 1992, related-party shipments, whether destined for U.S. or foreign affiliates, declined, by quantity in units, and domestic and export shipments to unrelated parties increased, resulting in an overall increase in total shipments. By value, total shipments fell in comparing the periods January-March 1991 and January-March 1992, with declines in affiliate shipments (domestic and foreign) and unrelated domestic shipments and an increase in unrelated export shipments. U.S. producers' shipments of cased DRAMs of 1 Meg and above increased, by quantity in bits, during all periods for which data were requested.

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[24] The physical size of the die is also influenced by "shrink technologies." Micron has indicated that it, as well as other producers of DRAMs, attempts to "shrink" the die size once it perfects a certain density of DRAM, enabling it to produce more dice per wafer (transcript of the conference, p. 60).

Table 5
DRAMs of 1 Meg and above, cased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
	Quantity (1,000 units)[2]				
Domestic shipments.....	***	***	***	***	***
Company transfers.....	***	***	***	***	***
U.S. shipments.....	20,246	81,756	127,983	31,464	56,413
Unrelated exports[3].....	***	***	***	***	***
Affiliate exports.....	***	***	***	***	***
Total exports.....	***	***	***	***	***
Total shipments....	***	***	***	***	***
	Quantity (billion bits)				
Domestic shipments.....	***	***	***	***	***
Company transfers.....	***	***	***	***	***
U.S. shipments.....	21,230	89,700	156,154	35,623	70,198
Unrelated exports[3].....	***	***	***	***	***
Affiliate exports.....	***	***	***	***	***
Total exports.....	***	***	***	***	***
Total shipments....	***	***	***	***	***
	Value (1,000 dollars)				
Domestic shipments.....	***	***	***	***	***
Company transfers.....	***	***	***	***	***
U.S. shipments.....	237,591	460,051	616,443	148,340	137,268
Unrelated exports[3].....	***	***	***	***	***
Affiliate exports.....	***	***	***	***	***
Total exports.....	***	***	***	***	***
Total shipments....	***	***	***	***	***
	Average bit value (millicents)[4]				
Domestic shipments.....	***	***	***	***	***
Company transfers.....	***	***	***	***	***
U.S. shipments.....	1.12	.51	.39	.42	.20
Unrelated exports[3].....	***	***	***	***	***
Affiliate exports.....	***	***	***	***	***
All exports.....	***	***	***	***	***
All shipments.....	***	***	***	***	***

[1] Data presented are from 8 of the 11 known U.S. producers of DRAMs. Note that the data presented are from U.S. fabrication and assembly/test facilities and that they may include products fabricated or assembled and tested outside the United States. In addition, the data may also be affected for the reasons set forth in the section of this report entitled "U.S. Capacity and Production."

[2] Shipments do not reconcile with production and inventories. Firms cited "rounding errors, scrap, cycle count adjustment, customer returns and recalls, and misidentification of the product" as reasons for the discrepancies.

[3] Unrelated export shipments were principally destined for ***.

[4] Average bit values are presented because these values are less affected by changes in product mix than are unit values. Bit values are calculated from unrounded figures.

Note.--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 6
All DRAMs, cased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
	Quantity (1,000 units)[2]				
Domestic shipments.....	***	***	***	***	***
Company transfers.....	***	***	***	***	***
U.S. shipments.....	173,806	153,144	155,963	42,498	62,173
Unrelated exports[3].....	***	***	***	***	***
Affiliate exports.....	***	***	***	***	***
Total exports.....	***	***	***	***	***
Total shipments....	***	***	***	***	***
	Quantity (billion bits)				
Domestic shipments.....	***	***	***	***	***
Company transfers.....	***	***	***	***	***
U.S. shipments.....	60,596	108,011	163,345	38,462	71,706
Unrelated exports[3].....	***	***	***	***	***
Affiliate exports.....	***	***	***	***	***
Total exports.....	***	***	***	***	***
Total shipments....	***	***	***	***	***
	Value (1,000 dollars)				
Domestic shipments.....	***	***	***	***	***
Company transfers.....	***	***	***	***	***
U.S. shipments.....	792,865	606,554	665,854	167,809	145,020
Unrelated exports[3].....	***	***	***	***	***
Affiliate exports.....	***	***	***	***	***
Total exports.....	***	***	***	***	***
Total shipments....	***	***	***	***	***
	Average bit value (millicents)[4]				
Domestic shipments.....	***	***	***	***	***
Company transfers.....	***	***	***	***	***
U.S. shipments.....	1.31	.56	.41	.44	.20
Unrelated exports[3].....	***	***	***	***	***
Affiliate exports.....	***	***	***	***	***
All exports.....	***	***	***	***	***
All shipments.....	***	***	***	***	***

[1] Data presented are from 8 of the 11 known U.S. producers of DRAMs. Note that the data presented are from U.S. fabrication and assembly/test facilities and that they may include products fabricated or assembled and tested outside the United States. In addition, the data may also be affected for the reasons set forth in the section of this report entitled "U.S. Capacity and Production."

[2] Shipments do not reconcile with production and inventories. Firms cited "rounding errors, scrap, cycle count adjustment, customer returns and recalls, and misidentification of the product" as reasons for the discrepancies.

[3] Unrelated export shipments were principally destined for ***.

[4] Average bit values are presented because these values are less affected by changes in product mix than are unit values. Bit values are calculated from unrounded figures.

Note.--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.

Total shipments of all cased DRAMs, as reported by quantity in units and value, fell from 1989 to 1991, resulting from a decline in unrelated domestic and export shipments. From 1989 to 1991, domestic and foreign affiliate shipments increased. For the periods January-March 1991 and January-March 1992, unrelated domestic and export shipments by quantity in units contributed to a total shipments increase, whereas declines were reported for domestic and foreign affiliate shipments. By value, domestic and foreign affiliate shipments, as well as unrelated domestic shipments contributed to a decline in total shipments of all cased DRAMs from January-March 1991 to January-March 1992, whereas an increase was reported for unrelated exports.

The average bit value of U.S. producers' shipments of cased DRAMs of 1 Meg and above and of all cased DRAMs fell during all periods for which data were requested.

U.S. producers' shipments of uncased DRAMs of 1 Meg and above and all uncased DRAMs are presented in tables 7 and 8. See appendix C for a presentation of U.S. producers' shipments of uncased DRAMs by densities.

Total shipments of uncased DRAMs of 1 Meg and above, ***, increased during all periods, by quantity in units and bits and by value. Total shipments of all uncased DRAMs increased during all periods, by quantity in bits and by value; however, total shipments, by quantity in units, decreased from 1989 to 1990 and then increased in 1991 to a level below that attained in 1989. Average bit value of U.S. producers' shipments of uncased DRAMs of 1 Meg and above and of all uncased DRAMs fell during all periods for which data were requested.

U.S. Producers' Inventories

Data for U.S. producers' inventories of cased and uncased DRAMs are presented in tables 9 and 10. See appendix C for a presentation of U.S. producers' inventories of cased and uncased DRAMs by densities.

U.S. producers' inventories of cased DRAMs increased during all periods for which data were requested. For DRAMs of 1 Meg and above, the ratio of inventories of cased DRAMs to total cased DRAM shipments fell from 1989 to 1990 and remained steady in 1991. A further decline in the ratio was reported in comparing the periods January-March 1991 to January-March 1992. For all DRAMs, the ratio increased from 1989 to 1991, but fell when comparing January-March 1991 to January-March 1992.

Inventories of uncased DRAMs held by U.S. producers fell, by quantity and as a ratio to total shipments, from 1989 to 1991 and increased when comparing January-March 1991 to January-March 1992.

Table 7
DRAMs of 1 Meg and above, uncased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Of the eight reporting producers, *** firms reported shipments of uncased DRAMs of 1 Meg and above.

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

Table 8
All DRAMs, uncased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Of the eight reporting producers, *** firms reported shipments of uncased DRAMs of 1 Meg and above.

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

Table 9
DRAMs, cased: End-of-period inventories of U.S. producers, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from 8 of the 11 known U.S. producers of DRAMs. Note that the data presented are from U.S. fabrication and assembly/test facilities and that they may include products fabricated or assembled and tested outside the United States. In addition, the data may also be affected for the reasons set forth in the section of this report entitled "U.S. Capacity and Production."

Note.--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.

Table 10
DRAMs, uncased: End-of-period inventories of U.S. producers, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

[1] Of the eight reporting producers, *** firms reported shipments of uncased DRAMs. Data presented for uncased DRAMs do not include ***.

Note.--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.

U.S. Employment, Wages, and Productivity

Six U.S. DRAM producers supplied full employment information in response to the Commission's request for data. These data are presented in table 11.

The number of production and related workers producing DRAMs increased from 1989 to 1990, but fell in 1991, and the hours worked by production and related workers fell consistently from 1989 to 1991. An increase was reported for the number of workers and hours worked when comparing January-March 1992 to the same period in 1991. The production and related workers' wages and total compensation paid followed the same trends as the number of workers during the period. Hourly total compensation paid and hourly wages paid increased during every period, whereas productivity fell from 1989 to 1990, increased in 1991, and fell between January-March 1991 and January-March 1992. Unit labor costs increased from 1989 to 1990, fell in 1991, and rose between January-March 1991 and January-March 1992.

*** U.S. DRAM producers reported a reduction in the number of production and related workers of at least 5 percent or 50 workers.

* * * * * * *

Financial Experience of U.S. Producers

Five producers of DRAMs, Fujitsu, Hitachi, Micron, NEC, and TI, supplied financial data on overall establishment operations, operations on all DRAMs, and operations on 1 Meg and above DRAMs. These producers represented approximately *** percent of U.S. cased and uncased DRAM shipments in 1991. The U.S. operations of each firm varied, with some producers manufacturing *** in the United States, while the operations of others are widely scattered throughout the world. In addition, the firms produce ***. The financial data presented represent the aggregation of each diversified firm's U.S. operations. *** were unable to provide the requested financial data.

Table 11
Average number of production and related workers in U.S. establishments wherein all DRAMs are produced, hours worked,[1] wages and total compensation paid to such employees, hourly wages and hourly total compensation paid, productivity, and unit labor costs,[2] by products, 1989-91, January-March 1991, and January-March 1992[3]

Item	1989	1990	1991	January-March-- 1991	January-March-- 1992
	Number of production and related workers (PRWs)				
1 Meg and above DRAMs...	2,933	4,974	5,355	4,769	5,306
Under 1 Meg DRAMs.....	2,963	1,310	554	587	336
Total, all DRAMs....	5,896	6,284	5,909	5,356	5,642
All products.....	8,472	9,169	10,044	9,914	9,967
	Hours worked by PRWs (1,000 hours)				
1 Meg and above DRAMs...	5,701	9,199	10,047	2,303	2,462
Under 1 Meg DRAMs.....	5,978	2,446	1,077	282	159
Total, all DRAMs....	11,679	11,645	11,124	2,585	2,621
All products.....	16,335	16,857	18,430	4,487	4,587
	Wages paid to PRWs (1,000 dollars)				
1 Meg and above DRAMs...	70,959	150,791	172,048	37,670	43,373
Under 1 Meg DRAMs.....	90,737	38,442	15,989	3,984	2,527
Total, all DRAMs....	161,696	189,233	188,037	41,654	45,900
All products.....	222,802	270,737	318,832	75,739	80,724
	Total compensation paid to PRWs (1,000 dollars)				
1 Meg and above DRAMs...	93,904	190,979	217,512	48,125	53,420
Under 1 Meg DRAMs.....	116,764	45,496	17,457	4,579	2,749
Total, all DRAMs....	210,668	236,475	234,969	52,704	56,169
All products.....	293,791	338,844	399,637	95,265	99,037
	Hourly wages paid to PRWs				
1 Meg and above DRAMs...	$12.45	$16.39	$17.12	$16.36	$17.62
Under 1 Meg DRAMs.....	15.18	15.72	14.85	14.13	15.89
Average, all DRAMs..	13.85	16.25	16.90	16.11	17.51
All products.....	13.64	16.06	17.30	16.88	17.60
	Hourly total compensation paid to PRWs				
1 Meg and above DRAMs...	$16.47	$20.76	$21.65	$20.90	$21.70
Under 1 Meg DRAMs.....	19.53	18.60	16.21	16.24	17.29
Average, all DRAMs..	18.04	20.31	21.12	20.39	21.43
All products.....	17.99	20.10	21.68	21.23	21.59
	Productivity (DRAMs per hour)				
1 Meg and above DRAMs...	16.1	20.3	29.4	29.3	29.7
Under 1 Meg DRAMs.....	42.9	47.9	41.3	51.4	29.1
Average, all DRAMs..	29.8	25.9	29.1	31.0	27.9
	Unit labor costs				
1 Meg and above DRAMs...	$1.03	$1.03	$0.75	$0.72	$0.75
Under 1 Meg DRAMs.....	.46	.39	.39	.32	.60
Average, all DRAMs..	.61	.78	.73	.66	.77

[1] Includes hours worked plus hours of paid leave time.
[2] On the basis of total compensation paid.
[3] The *** firms providing employment data presented accounted for *** percent of total DRAM shipments in 1991.

Note.--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.

Of the responding producers, operations on all DRAMs represented about *** percent, and operations on 1 Meg and above DRAMs represented *** percent of overall establishment operations in 1991.

OVERALL ESTABLISHMENT OPERATIONS

Income-and-loss data on the overall establishment operations of the producers with U.S. operations are shown in table 12. A brief description of the financial results of the parent corporation of each producer is presented below to give some overview on the typical financial position of firms participating in this industry.

Fujitsu is a major global corporation, with headquarters in Tokyo, Japan. It produces computers and information-processing systems, communications systems, and electronic devices. The company's net sales in fiscal year 1991 were ***, with net income of ***, compared with U.S. DRAM establishment sales in 1991 of ***. In addition to DRAMs, Fujitsu produces application-specific integrated circuits and EPROMs/ECL RAMs ***.

Hitachi is a Japanese-based multinational corporation that produces a wide variety of consumer products, information and communication systems, electronic devices, and other products. Sales in fiscal year 1991 were *** and net income was ***, compared with U.S. DRAM establishment sales of ***. Hitachi produces DRAMs, microcomputers, and SRAMs ***. ***.

* * * * * * *

NEC is an international supplier of electronic products ranging from communications systems to computers and electronic devices. The Japanese-based company had 1991 fiscal year sales of *** and net income of ***. The company's 1991 U.S. DRAM establishment sales were ***, which included ***.

TI, headquartered in Dallas, TX, is a high-technology company that markets products such as semiconductors, computer systems, defense electronics, and consumer electronics. Net revenues for 1991 were *** and the company reported ***. DRAM establishment sales for 1991 totaled *** and included ***.

OPERATIONS ON DRAMS OF 1 MEG AND ABOVE

There are *** producers included in the 1 Meg and above DRAM operations, ***. ***.

The production costs and sources of the U.S. producers of 1 Meg and above DRAMs for their most current fiscal year are included in appendix D. For 1 Meg DRAMs, the total domestic value added as a share of total cost ranged from a high of approximately *** percent for *** to a low of *** percent for ***. For 4 Meg DRAMs, the total domestic value added as a share of total cost ranged from a high of approximately *** percent for *** to a low of *** percent for ***. These value-added percentages are just an indication of the cost and location of the production efforts of the producers, as the data do not cover all the sales of each producer.

Table 12
Income-and-loss experience of U.S. producers on the overall operations of their establishments wherein all DRAMs are produced, fiscal years 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
	*	*	*	*	*

[1] The producers are Fujitsu, Hitachi, Micron, NEC, and TI. All have fiscal years ending ***. The data of companies with a *** fiscal year end are aggregated in the previous fiscal year.

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

The 1 Meg and above DRAM operations of U.S. producers responding to Commission questionnaires are shown in table 13. Net sales increased *** from 1989 to 1990 as the production and marketing of DRAMS of 1 Meg and above accelerated. Sales increased again from 1990 to 1991, ***. As indicated in table 14, the per-unit average sales value dropped annually from 1989 to 1991, but aggregate sales revenue increased due to ***. This trend continued in the interim period, as net sales increased from January-March 1991 to the same period in 1992 based on ***.

Operating *** were incurred in all periods for the reporting companies in the aggregate, and *** companies experienced operating *** in each period. However, the operating *** ratio for the U.S. producers *** from *** percent in 1989 to *** percent in 1991 and to *** percent in interim 1992.

Selected income-and-loss data for DRAMs of 1 Meg and above, by firm, are presented in table 15. *** (appendix D).

ALL DRAMS

The operations of the reporting U.S. producers on DRAMs of all densities are shown in table 16. Sales reflect the changing composition of the product mix of the reporting producers, as sales were substantially comprised of 1 Meg and above DRAMs from 1990 through March 1992. The per-unit sales value (table 17) increased from 1989 to 1991, as more 1 Meg and above DRAMs were produced, and increased from January-March 1991 to 1992, again reflecting the impact of the larger density DRAMs, which offset the lower per-unit values of the under-1 Meg DRAMs. Total net sales values and quantities of all DRAMs declined in the January-March 1992 quarter compared with the same period in 1991. After 1989, operating *** and operating *** margins are dominated by the results of the 1 Meg and above DRAMs. ***.

Presented in table 18 is a summary of the difference between all DRAM operations (table 16) and operations on DRAMs of 1 Meg and above (table 13) for the responding producers; therefore, it represents operations on under-1 Meg DRAMs.

Table 13
Income-and-loss experience of U.S. producers on their operations producing DRAMs of 1 Meg and above, fiscal years 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

[1] The producers are ***.

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

Table 14
Income-and-loss experience (on a per-DRAM basis) of U.S. producers on their operations producing DRAMs of 1 Meg and above, fiscal years 1989-91, January-March 1991, and January-March 1992

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

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

Table 15
Income-and-loss experience of U.S. producers on their operations producing DRAMs of 1 Meg and above, by firms, fiscal years 1989-91, January-March 1991, and January-March 1992

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

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

Table 16
Income-and-loss experience of U.S. producers on their operations producing all DRAMs, fiscal years 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

[1] The producers are ***.

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

Table 17
Income-and-loss experience (on a per-DRAM basis) of U.S. producers on their operations producing all DRAMs, fiscal years 1989-91, January-March 1991, and January-March 1992

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

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

Table 18
Summary of the difference between all DRAM operations and operations on DRAMs of 1 Meg and above, 1989-91, January-March 1991, and January-March 1992

Item	1989	1990	1991	Jan.- March 1991	1992
*	*	*	*	*	*	*

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

Cash flow is an important financial indicator in this capital-intensive industry. Depreciation is a relatively high share of cost, due to the large capital investments in production facilities and equipment and the relatively short useful life of the equipment used in DRAM production. In both the operations on all DRAMs and on DRAMs of 1 Meg and above, capital expenditures ***.

Selected income and loss data for all DRAMS, by firm, are presented in table 19. The financial results of the operations of these firms are influenced by their specific products produced. All firms produced assembled or unassembled DRAMs, but they also produced items such as cut and uncut dice, SIPs, SIMMs, memory cards, and VRAMs.

Table 19
Income-and-loss experience of U.S. producers on their operations producing all DRAMs, by firms, fiscal years 1989-91, January-March 1991, and January-March 1992

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

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

INVESTMENT IN PRODUCTIVE FACILITIES AND RETURN ON ASSETS

Data on investment in productive facilities and return on assets are shown in table 20.

Table 20
Value of assets and return on assets of U.S. producers' establishments wherein all DRAMs are produced, fiscal years 1989-91, January-March 1991, and January-March 1992

Item	As of the end of fiscal year-- 1989	1990	1991	As of Mar. 31-- 1991	1992
*	*	*	*	*	*	*

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

CAPITAL EXPENDITURES

The capital expenditures of the producers are shown in table 21.

Table 21
Capital expenditures by U.S. producers of all DRAMs, by products, fiscal years 1989-91, January-March 1991, and January-March 1992

(In thousands of dollars)

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

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

RESEARCH AND DEVELOPMENT EXPENSES

The research and development expenditures of the responding producers are shown in table 22. The ability to fund continuing research and development in this industry is critical to continued profitability. All research and development for *** is provided by parent company research facilities. *** U.S. expenditures were ***. In addition, ***.

Table 22
Research and development expenses of U.S. producers of all DRAMs, by products, fiscal years 1989-91, January-March 1991, and January-March 1992[1]

(In thousands of dollars)

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*	*

[1] The producers are ***.

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

CAPITAL AND INVESTMENT

The Commission requested the U.S. producers to describe any actual or potential negative effects of imports of DRAMs of 1 Meg and above from Korea on their growth, development and production efforts, investment, and/or ability to raise capital (including efforts to develop a derivative or improved version of its product). Comments from the companies are presented in appendix E.

CONSIDERATION OF THE QUESTION OF THREAT OF MATERIAL INJURY

Section 771(7)(F)(i) of the Tariff Act of 1930 (19 U.S.C. § 1677(7)(F)(i)) provides that--

> In determining whether an industry in the United States is threatened with material injury by reason of imports (or sales for importation) of the merchandise, the Commission shall consider, among other relevant economic factors[25]--
>
> (I) If a subsidy is involved, such information as may be presented to it by the administering authority as to the nature of the subsidy (particularly as to whether the subsidy is an export subsidy inconsistent with the Agreement),
>
> (II) any increase in production capacity or existing unused capacity in the exporting country likely to result in a significant increase in imports of the merchandise to the United States,
>
> (III) any rapid increase in United States market penetration and the likelihood that the penetration will increase to an injurious level,
>
> (IV) the probability that imports of the merchandise will enter the United States at prices that will have a depressing or suppressing effect on domestic prices of the merchandise,
>
> (V) any substantial increase in inventories of the merchandise in the United States,
>
> (VI) the presence of underutilized capacity for producing the merchandise in the exporting country,
>
> (VII) any other demonstrable adverse trends that indicate the probability that the importation (or sale for importation) of the merchandise (whether or not it is actually being imported at the time) will be the cause of actual injury,

---

[25] Section 771(7)(F)(ii) of the act (19 U.S.C. § 1677(7)(F)(ii)) provides that "Any determination by the Commission under this title that an industry in the United States is threatened with material injury shall be made on the basis of evidence that the threat of material injury is real and that actual injury is imminent. Such a determination may not be made on the basis of mere conjecture or supposition."

> (VIII) the potential for product-shifting if production facilities owned or controlled by the foreign manufacturers, which can be used to produce products subject to investigation(s) under section 701 or 731 or to final orders under section 706 or 736, are also used to produce the merchandise under investigation,
>
> (IX) in any investigation under this title which involves imports of both a raw agricultural product (within the meaning of paragraph (4)(E)(iv)) and any product processed from such raw agricultural product, the likelihood that there will be increased imports, by reason of product shifting, if there is an affirmative determination by the Commission under section 705(b)(1) or 735(b)(1) with respect to either the raw agricultural product or the processed agricultural product (but not both), and
>
> (X) the actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the like product.[26]

Information on the volume, U.S. market penetration, and pricing of imports of the subject merchandise (items (III) and (IV) above) is presented in the section entitled "Consideration of the Causal Relationship Between Imports of the Subject Merchandise and the Alleged Material Injury" and information on the effects of imports of the subject merchandise on U.S. producers' existing development and production efforts (item (X)) is presented in the section entitled "Consideration of Alleged Material Injury." Available information on U.S. inventories of the subject products (item (V)); foreign producers' operations, including the potential for "product-shifting" (items (II), (VI), and (VIII) above); any other threat indicators, if applicable (item (VII) above); and any dumping in third-country markets, follows. Other threat indicators have not been alleged or are otherwise not applicable.

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

U.S. Inventories of DRAMs From Korea

Data for U.S. importers' inventories of cased DRAMs are presented in table 23. There were *** imports *** inventories of uncased DRAMs from Korea by importers during the period for which information was requested. See appendix C for a presentation of U.S. importers' inventories of Korean DRAMs by densities.

U.S. importers' inventories of cased DRAMs of 1 Meg and above, by quantity in units, fell from 1989 to 1991, but increased when comparing the period January-March 1992 with the same period in 1991. U.S. importers' inventories of all cased DRAMs, by quantity in units, fell during all periods for which data were requested. By quantity in bits, U.S. importers' inventories of cased DRAMS of 1 Meg and above and of all cased DRAMs increased during all periods.

Ability of Korean Producers to Generate Exports and the Availability of Export Markets Other Than the United States

The Commission requested information regarding Korean operations producing DRAMs. Responses to this request were provided by Goldstar, Hyundai, and Samsung. Data received by the Commission on Korean DRAM operations (uncased and cased) are presented in table 24. The data are believed to account for all Korean exports of DRAMs to the United States from 1989 to March 1992.

KOREAN DRAM OPERATIONS

Capacity was reported by the Korean producers in units of DRAMs based on either actual or intended production and yields of the products produced. The method by which each Korean producer calculated capacity is explained briefly below.

Goldstar reported capacity in each period for which information was requested based on the production of *** DRAMs at the rate of *** wafers per month, *** dice per wafer, and *** percent cumulative yield.

* * * * * * *

Hyundai reported capacity in each period for which information was requested based on the production of ***. The capacity of *** was reported based on the production, as of ***, of *** DRAMs at the rate of *** wafers per month, *** dice per wafer, *** percent yield at wafer sort, and *** percent yield after encapsulation and testing. The capacity of *** was reported based on the production, as of ***, of *** DRAMs at the rate of *** wafers per month, *** dice per wafer, *** percent yield at wafer sort, and *** percent yield after encapsulation and testing.

* * * * * * *

Table 23
DRAMs, cased: U.S. importers' end-of-period inventories of Korean DRAMs, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
	*	*	*	*	*

[1] Inventory data presented are from *** firms that reported cased DRAM imports from Korea and are estimated to account for *** percent of U.S. imports from Korea. Of the *** firms reporting imports of cased DRAMs from Korea, *** maintained inventories. ***.

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

Table 24
DRAMs: Korean capacity, production, capacity utilization, end-of-period inventories, exports to the United States, exports to all other markets, home-market shipments, and total shipments, 1989-91, January-March 1991, January-March 1992, and projections for 1992-93[1] [2]

(In thousands of units, except where noted)

Item	1989	1990	1991	January-March-- 1991	1992	Projections for-- 1992	1993
	*	*	*	*	*	*	*

[1] Data presented are believed to account for all Korean exports to the United States of DRAMs from 1989 to March 1992.

[2] Goldstar reported capacity based on operating *** hours per week and *** weeks per year. Hyundai reported capacity based on operating *** hours per week and *** weeks per year. Samsung reported capacity based on operating *** hours per week and *** weeks per year. Please refer to the section entitled "Korean DRAM Operations" for a more detailed explanation of the methods used by each firm in calculating capacity and their effect on capacity utilization.

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

Samsung reported capacity in each period for which information was requested based on the firm's actual production rate and yields.

* * * * * * *

In Goldstar's, Hyundai's, and Samsung's most recent fiscal years, cased DRAMs represented *** percent of total sales, respectively, and uncased DRAMs represented *** percent of total sales, respectively.

Total reported Korean capacity increased from 1989 to 1991 for both 1 Meg and above DRAMs and all DRAMs, although the increase was somewhat irregular for all DRAMs. Korean capacity fell in January-March 1992 when compared to January-March 1991. Korean production of 1 Meg and above DRAMs and of all DRAMs increased steadily from 1989 to 1991. January-March 1992 production data for 1 Meg and above DRAMs show an increase over the comparable period in 1991 and the production data for all DRAMs reveal a decline in the same period.

Shipments of 1 Meg and above DRAMs to the United States, which accounted for a declining share of Korean producers' total shipments of 1 Meg and above DRAMs, increased in all periods for which data were requested. Shipments of all DRAMs to the United States, which accounted for a declining share of Korean producers' total shipments of all DRAMs from 1989 to 1991, increased irregularly throughout the period for which data were requested. Exports of DRAMs of 1 Meg and above and exports of all DRAMs to all countries other than the United States and to the home market increased substantially from 1989 to 1991. Increases in exports of DRAMs of 1 Meg and above and in exports of all DRAMs to countries other the United States were also reported for January-March 1992 over the comparable period in 1991; however, January-March 1992 home-market shipment data for DRAMs of 1 Meg and above and for all DRAMs show a decline from the comparable period in 1991. Korean producers' total shipments of 1 Meg and above DRAMs increased in all periods for which data were requested, while Korean producers' shipments of all DRAMs increased from 1989 to 1991, but fell in January-March 1992 compared with January-March 1991.

Korean producers' end-of-period inventories of DRAMs of 1 Meg and above and of all DRAMs increased from 1989 to 1991, although the increase was irregular for all DRAMs. An increase was also reported for the comparable partial year periods in 1991 and 1992. The ratios of end-of-period inventories to total shipments of DRAMs of 1 Meg and above ranged from 6 percent to 8 percent during the period for which data were collected and the ratios of all DRAMs ranged from 7 percent to 11 percent during the same period.

Projections reported by Korean producers indicate that exports of 1 Meg and above DRAMs and of all DRAMs to the United States are expected to decline in terms of quantity and relative to the Korean producers' total DRAM shipments. All three producers indicated that total shipments of 1 Meg and above DRAMs and of all DRAMs are expected to fall in 1993.

EC INVESTIGATION

In response to a complaint filed in June 1990 on behalf of the European Electronic Manufacturers Association, the European Commission initiated on June 21, 1990, an antidumping investigation concerning imports of DRAMs above 64K, including VRAMs, from Korea. Responses have currently been filed with the EC and verifications have been conducted. The EC's Council of Ministers is scheduled to reach a preliminary decision on the level of dumping, if any, in June 1992.

CONSIDERATION OF THE CAUSAL RELATIONSHIP BETWEEN IMPORTS OF THE SUBJECT MERCHANDISE AND THE ALLEGED MATERIAL INJURY

U.S. Imports

Importers' questionnaires were sent to 30 firms identified as possible importers of DRAMs. Nineteen firms indicated that they imported DRAMs into the United States during the period for which information was requested; however, usable import data were received from only 13 companies.[27] Four companies responded that they did not import DRAMs and seven companies did not respond to the Commission's request for information.

Official import statistics collected by the U.S. Department of Commerce for products covered by HTS statistical reporting numbers enumerated in the section of this report entitled "Introduction" include products that are outside the scope of this investigation.[28] Since the import data collected by the U.S. Department of Commerce overstate U.S. imports of DRAMs during a portion of the period for which information was requested, for the purposes of presentation in this report, U.S. imports of DRAMs from all countries consist of data provided by U.S. importers in response to importers' questionnaires. As stated above, 13 firms provided usable import data. Data presented in this section of the report account for *** percent of U.S. DRAM imports from Korea and *** of total U.S. DRAM imports from countries other than Korea. *** imports of uncased DRAMs from Korea were reported.

Presented in tables 25 and 26 are U.S. imports of cased DRAMs of 1 Meg and above and all cased DRAMs from Korea and all other countries. See appendix C for a presentation of U.S. imports of cased DRAMs by densities. Included in tables 25 and 26 along with U.S. imports of cased DRAMs are ***. Not included in tables 25 and 26 are ***. These items are presented separately in the following tabulation, by quantity in units:

* * * * * * *

---

[27] Of the six importing firms not supplying data, *** are believed to import DRAMs from Korea. The firms are ***. ***.

[28] The method by which DRAMs were classified under the HTS changed during the period for which information was requested in this investigation. Prior to 1991, all DRAMs were classified under a number that also included SRAMs. Beginning in 1991, DRAMs and SRAMs were given separate classification numbers.

Table 25
DRAMs of 1 Meg and above, cased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
	Quantity (1,000 units)[2]				
Korea	***	***	***	***	***
Other sources[3]	***	***	***	***	***
Total	94,040	126,875	161,057	40,249	53,690
	Quantity (billion bits)				
Korea	***	***	***	***	***
Other sources[3]	***	***	***	***	***
Total	99,745	161,534	293,756	62,433	121,252
	Value (1,000 dollars)[4]				
Korea	***	***	***	***	***
Other sources[3]	***	***	***	***	***
Total	1,091,772	889,655	1,177,241	258,844	395,164
	Average bit value (millicents)[5]				
Korea	***	***	***	***	***
Other sources[3]	***	***	***	***	***
Average	1.09	.55	.40	.41	.33

[1] Data presented are reported by six U.S. importers of DRAMs from Korea and are believed to account for *** percent of U.S. imports of DRAMs from Korea during 1991. Nine firms reported U.S. imports of DRAMs from sources other than Korea. When compared to official statistics, these data appear to represent *** of total imported units of cased DRAMs from countries other than Korea. A total of 13 firms provided import data, *** of which maintain fabrication and/or assembly/test facilities in the United States. Data do not include all imports of cased DRAMs of 1 Meg and above. See the text accompanying this table for an explanation of the data not included.

[2] Imports do not reconcile with inventories and shipments. Firms cited "scrap, returns, estimates, rounding errors, physical and cycle count differences, and warehouse transfer adjustments" as reasons for the discrepancies.

[3] As presented, imports from countries other than Korea consist of imports from ***.

[4] Landed, duty-paid value.

[5] Average bit values are presented because these values are less affected by changes in product mix than are unit values. Bit values are calculated from unrounded figures.

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

Table 26
All DRAMs, cased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
	Quantity (1,000 units)[2]				
Korea	***	***	***	***	***
Other sources[3]	***	***	***	***	***
Total	184,573	202,355	199,947	51,687	60,138
	Quantity (billion bits)				
Korea	***	***	***	***	***
Other sources[3]	***	***	***	***	***
Total	120,622	180,071	303,752	65,412	122,870
	Value (1,000 dollars)[4]				
Korea	***	***	***	***	***
Other sources[3]	***	***	***	***	***
Total	1,346,418	996,243	1,226,779	273,931	402,963
	Average bit value (millicents)[5]				
Korea	***	***	***	***	***
Other sources[3]	***	***	***	***	***
Average	1.12	0.55	0.40	0.42	0.33

[1] Data presented are reported by six U.S. importers of DRAMs from Korea and are believed to account for *** percent of U.S. imports of DRAMs from Korea during 1991. Nine firms reported U.S. imports of DRAMs from sources other than Korea. When compared to official statistics, these data appear to represent *** of total imported units of cased DRAMs from countries other than Korea. A total of 13 firms provided import data, *** of which maintain fabrication and/or assembly/test facilities in the United States. Data do not include all imports of cased DRAMs of 1 Meg and above. See the text accompanying this table for an explanation of the data not included.

[2] Imports do not reconcile with inventories and shipments. Firms cited "scrap, returns, estimates, rounding errors, physical and cycle count differences, and warehouse transfer adjustments" as reasons for the discrepancies.

[3] As presented, imports from countries other than Korea consist of imports from ***.

[4] Landed, duty-paid value.

[5] Average bit values are presented because these values are less affected by changes in product mix than are unit values. Bit values are calculated from unrounded figures.

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

Also not included in the aggregate import presentations in this report are ***.

* * * * * * *

Other items not included in the data are ***.

U.S. imports of cased DRAMs of 1 Meg and above, which generally accounted for an increasing share of total U.S. imports, and of all cased DRAMs, increased in all periods for which information was requested, by quantity in units. The value of these imports fell from 1989 to 1990; however, cased DRAMs of 1 Meg and above increased in 1991 to a value higher than that in 1989, while all cased DRAMs increased in 1991 to a value lower than that in 1989. Increases in the value of imports of cased DRAMs of 1 Meg and above and all cased DRAMs were reported in January-March 1992 over the comparable period in 1991.

Presented in table 27 are U.S. imports of uncased DRAMs. *** imports of uncased DRAMs from Korea were reported by U.S. importers during the period for which data were requested. See appendix C for a presentation of U.S. imports of uncased DRAMs by densities.

U.S. imports of uncased DRAMs of 1 Meg and above and of all DRAMs, by quantity and value, declined from 1989 to 1990, whereas an increase was reported in the quantity and value of uncased DRAMs of 1 Meg and above and in the value of all uncased DRAMs from 1990 to 1991. The quantity in units of all uncased DRAM imports fell from 1990 to 1991. In comparing the periods January-March 1991 and January-March 1992, U.S. imports of uncased DRAMs of 1 Meg and above and of all uncased DRAMs fell, by quantity in units and by value.

*** U.S. importers of Korean DRAMs that provided import data reported imports of the product from Korea scheduled for delivery after March 31, 1992.[29] The *** firms reported *** DRAMs scheduled to be delivered after March 31, 1992, ***.

U.S. Producers' Imports

*** reported imports of DRAMs from Korea. *** data concerning *** imports of DRAMs from Korea are presented in table 28. See appendix C for the data presented by densities. *** imports of Korean DRAMs, ***, accounted for *** percent of the quantity in units of U.S. imports of DRAMs of 1 Meg and above from Korea in 1991 and *** percent of the quantity of U.S. imports of all Korean DRAMs.

* * * * * * *

[29] Not included in the six U.S. importers of Korean DRAMs is ***.

Table 27
DRAMs, uncased: U.S. imports, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Of the 13 firms providing import data, *** reported imports of uncased DRAMs. *** firms identified the country-of-origin of the uncased DRAMs as ***. The *** firms did not indicate the country-of-origin of the uncased DRAMs. There were *** reported U.S. imports of uncased DRAMs from Korea during the period for which information was requested. Based on official statistics, the data presented are estimated to account for *** of U.S. imports of uncased DRAMs.

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

Table 28
DRAMs, cased: U.S. producers' imports from Korea, by densities, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from ***. ***.

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

U.S. Market Penetration By the Subject Imports

Market penetration, as presented in table 29, is calculated using U.S. shipments of U.S.-produced and imported DRAMs as submitted in response to Commission's questionnaires.[30] See appendix C for market penetration by the subject imports by densities.

[30] The data presented in table 29 do not include certain import data. See the section of this report entitled "U.S. Imports" for an explanation of the data not included.

Table 29
DRAMs, cased: U.S. shipments of subject imports[1] as a share of apparent U.S. consumption of 1 Meg and above DRAMs and of all DRAMs, 1989-91, January-March 1991, and January-March 1992[2]

(In percent)

Item	1989	1990	1991	January-March-- 1991	1992
	U.S. shipments of subject imports as a share of the quantity (in units) of U.S. consumption				
1 Meg and above Korean DRAMs as a share of--					
1 Meg and above.....	19.2	17.8	26.1	20.4	23.9
All DRAMs.....	5.9	10.6	21.1	15.1	21.3
	U.S. shipments of subject imports as a share of the quantity (in bits) of U.S. consumption				
1 Meg and above Korean DRAMs as a share of--					
1 Meg and above.....	19.1	16.9	25.1	18.5	28.2
All DRAMs.....	12.5	14.7	24.1	17.3	27.7
	U.S. shipments of subject imports as a share of the value of U.S. consumption				
1 Meg and above Korean DRAMs as a share of--					
1 Meg and above.....	15.7	14.2	21.6	15.6	30.3
All DRAMs.....	9.9	12.0	20.4	14.3	29.4

[1] The subject imports are 1 Meg and above DRAMs from Korea.

[2] Shipments of DRAM imports from Korea, as presented, are from data submitted by 6 U.S. importers of Korean DRAMs. The data presented by these firms are estimated to account for *** percent of DRAM imports from Korea in 1991. Data concerning the share of apparent U.S. consumption held by nonsubject imports and by U.S.-produced DRAMs are not presented due to the inability to determine the products' country of origin.

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

The share of apparent U.S. consumption of DRAMs of 1 Meg and above held by the subject imports, based on quantity in units and bits and on value, fell from 1989 to 1990, increased in 1991 to a level above that in 1989, and increased in January-March 1992 over the comparable period in 1991. The share of apparent U.S. consumption of all DRAMs held by the subject imports, based on quantity in units and bits and on value, increased consistently during the period for which data were requested.

The U.S. producers' share of apparent U.S. consumption of DRAMs and the share held by imports from countries other than Korea are not presented in this report due to the inherent inaccuracies in the data. See the section of this report entitled "U.S. Capacity and Production" for an explanation of the data provided.

Pricing and Marketing Considerations

DRAMs are used in a variety of products that require high-density, random access memory, such as computers, office automation equipment, telecommunication equipment, and consumer electronic products; therefore the demand for DRAMs depends upon the demand for these products.[31] Overall, the demand for DRAMs is said to have increased during the past 3 years.[32] The majority of DRAMs, about 60 to 70 percent, are used in personal computers.[33] Several industry experts argue that changes in the personal computer market have affected the demand and price levels in the DRAM market. One industry expert indicated that DRAM price declines have been exacerbated by successive rounds of price cutting by personal computer manufacturers, who in turn are demanding price breaks on DRAMs.[34] While respondents agree that personal computer price decreases have exerted downward pressure on DRAM prices, Micron reported that it has not experienced this type of pressure.[35]

The DRAM industry follows a fairly predictable product life cycle that generally lasts between 3-1/2 and 4 years. This is demonstrated by figure 1, which shows the life cycle of six generations of DRAMs. As each new DRAM is introduced to the market, selling prices and costs tend to be high. However, as the product moves from the introduction phase into the growth phase of the cycle, unit production costs and prices tend to fall because volumes increase and the producer is moving along the learning curve and is able to lower defects and increase yields.[36] As the product enters the maturity stage, costs are generally at the lowest level and prices continue to fall. In the DRAM industry it has been common that a new generation of DRAM enters the market as the previous one is in the growth or maturity phase. The competition between the two generations of DRAMs can also contribute to the fall in the price of the mature DRAM.[37]

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[31] The demand for DRAMs is often measured in bits rather than units. The main use of DRAMs is in computers, thus, most of the demand for DRAMs is derived from the demand for computers. A computer maker cares about storing data and wants to do so in the most effective way it can; therefore, it wants to get the most memory that it can in the least amount of space. As a result, the demand for DRAMs is based on the number of bits.

[32] Most suppliers, of both domestic and imported product, believe that demand has generally increased. One purchaser stated that the DRAM industry has already had explosive growth, but it is ready to grow even more as new applications continue to increase (transcript of the conference, p. 120).

[33] Transcript of the conference, p. 93.

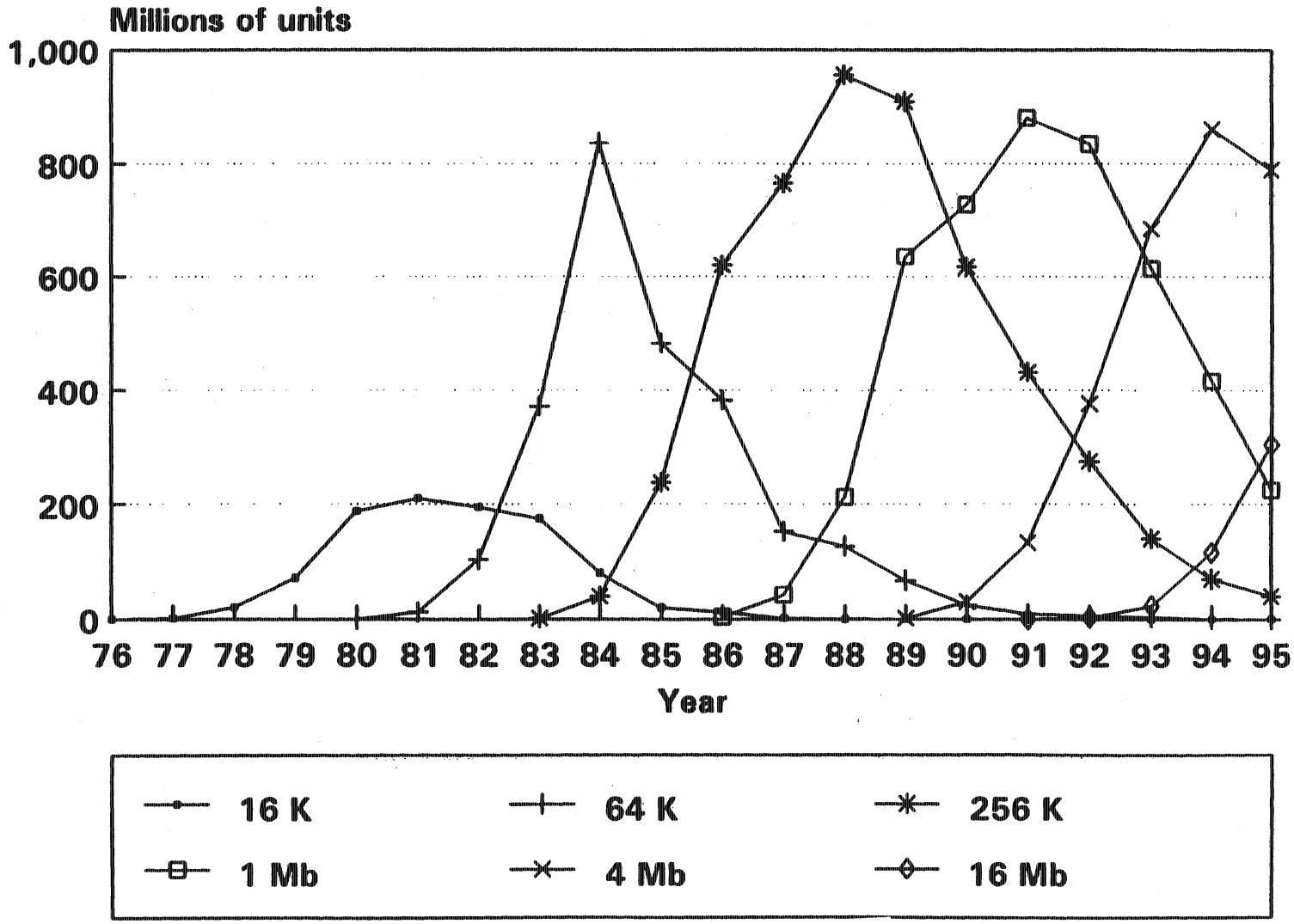
[34] Electronic News, Mar. 23, 1992, p. 8.

[35] Transcript of the conference, pp. 70 and 93.

[36] In the growth phase, competition increases as new firms enter the market. Often competitors that enter the market after the initial introduction phase do so at a lower price than the market leaders due to perceived risks and uncertainties in the newcomers' quality. Philip Kotler, Marketing Management, Analysis Planning, Implementation, and Control, Sixth Edition, p. 358.

[37] Respondents argue that Micron entered the 1 Meg DRAM market late and, as a result, was forced to accept a lower price than other suppliers. Price information obtained from questionnaires exhibit sales of Korean 1 Meg DRAMs prior to the introduction of U.S. 1 Meg DRAMs.

Figure 1 Worldwide shipments and forecasts of future shipments of DRAMs, by DRAM densities, 1976-95



Source: Dataquest

As mentioned in the "Channels of Distribution" section of this report, DRAMs are sold to a variety of customers including OEMs, franchise distributors, value-added or aftermarket resellers, and brokers or independent distributors. According to Micron, there are three main classes of customers. Tier one customers are the premium customers, most likely large OEM accounts. These customers are allegedly the most difficult to sell to because they are the most demanding with respect to quality. Because these firms often have relatively long qualification processes, suppliers are sometimes able to get a premium price in the marketplace for sales to these customers. Customers in the second tier are slightly less demanding. They tend to have shorter qualification processes but their prices tend to be lower. The third tier is the spot market, which has very few, if any, qualification procedures and relatively low prices.[38]

Qualification procedures and time required to qualify vary significantly among customer groups. In general, large OEM accounts (tier one customers) have the most sophisticated qualification processes, which can take anywhere from a few weeks to 9 months to complete. These customers require extensive component testing, system qualification utilizing a supplier's product, and inspection of the supplier's facility. Tier two customers, such as franchise distributors and value-added resellers, require a much less sophisticated qualification procedure; these customers generally test the product to verify operation. Tier three customers who purchase on a spot basis rarely have any type of formal qualification process.

While qualification requirements vary from firm to firm, all customers are generally concerned with the quality of the product.[39] There is disagreement as to whether domestic and Korean products are comparable in quality. In general, four of the five U.S. producers that responded to the questionnaire stated that differences in quality between the U.S. and Korean products were not a significant factor in the firm's sale of DRAMs. *** reported that the quality of its product is considered higher than that of the Koreans, particularly Goldstar and Hyundai. Another producer, ***, reported that the industry impression of the Korean product when it first entered the U.S. market was that the quality was inferior to that of the U.S. product; however, in recent months, the quality of the Korean product has improved and now rivals that of the domestic firms. Importers of Korean DRAMs reported more differences in the quality of the two products than the domestic firms did. All three major importers, Goldstar, Hyundai, and Samsung, reported that there were quality differences. Goldstar reported that ***. Hyundai stated that ***. Samsung also stated that ***. Finally, several purchasers appeared at the conference and reported that they did not purchase U.S.-produced DRAMs

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[38] The petitioner stated that these three markets were equivalent in size; however, the relative revenues and profits do not currently divide the market that way (transcript of the conference, pp. 33-34).

[39] The quality of DRAMs is often measured by the failure rate. Product failures can be particularly difficult for the smaller firms that purchase DRAMs to resell them. These firms often work on very small profit margins and product returns can often wipe out the small level of profit that they receive (transcript of the conference, pp. 108 and 117).

from Micron because of problems of compatibility, longer delivery times, less desirable credit terms, and defective product.[40]

In general, suppliers agreed that there are no substitute products for DRAMs. Several suppliers reported that in a limited number of applications SRAMs or VRAMs can be used in place of DRAMs; however, these firms also stated that this would not be cost effective because SRAMs and VRAMs are significantly more expensive than DRAMs of a comparable speed. One DRAM supplier, Goldstar, stated that there will be substantial infringement into the DRAM market by competing technologies such as flash EPROMs or SRAMs.[41] [42] According to Goldstar, this will occur because of increases in the amount of smaller personal computers, such as laptops, notebooks, and palmtops, in the marketplace; these computers require much lower power consumption and better data retention than a conventional DRAM provides.[43]

Within the DRAM market, many technological and marketing changes have occurred during the past 3 years. The product range of DRAMs has diversified significantly with the emergence of new packages, faster speeds, and an increased number of configurations. DRAMs are sold either as individual chips or as memory module packages (e.g., SIMMs). The price paid for a memory module, such as a SIMM, is higher than that of the DRAMs that it contains; the price of a SIMM includes not only the price for each DRAM in the module but also a charge for the additional assembly work to add the DRAMs to the substrate.[44] Prices for DRAMs of the same density also vary depending on the speed of the DRAM, with faster products generally commanding higher prices. According to Micron, although different customers have different uses for the different speeds, there is some substitutability between the speeds. Under normal circumstances, a faster product, i.e., a 70ns DRAM, could be used in an application that normally uses an 80 or 100ns DRAM.[45] DRAMs are also sold in several different configurations. For example, a 1 Meg DRAM is available either as a "1 Meg by 1" or "256K by 4" configuration.[46] These differ only in the way in which data move in and out of the DRAM; the overall memory of each is 1 Meg.[47] Prices of a given density DRAM may vary slightly depending on the type of configuration.

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[40] Transcript of the conference, pp. 110, 112-113, and 117.

[41] EPROMs are erasable programmable read only memory chips.

[42] Transcript of the conference, p. 170.

[43] Ibid, pp. 169-170.

[44] Previously, DRAM purchasers, particularly OEM accounts, assembled the single DRAMs into the SIMMs themselves; however, it has become increasingly common for the DRAM manufacturer to sell DRAMs as SIMM modules. In fact, a representative for Samsung reported that approximately 40 percent of its DRAM business is of module products. (transcript of the conference, p. 166).

[45] Transcript of the conference, p. 72.

[46] The common configurations for the 4 Meg DRAM are "1 Meg by 4" and "4 Meg by 1."

[47] *** stated that both configurations are important parts of the DRAM market; however, different end uses may be better suited to one or the other type of configuration.

Another change in the marketing of DRAMs is the increase in retail and corporate aftermarket sales of DRAMs.[48] This increase has been attributed to the desire of computer users to upgrade their existing machines and add extra memory. The slowdown in the overall economy during the past 2 years has spurred the growth in aftermarket sales of DRAMs; computer users have increasingly chosen to upgrade existing machines instead of spending money to purchase new machines. In addition, new software applications, such as Microsoft's Windows software package, require additional memory and, thus, are contributing to the increasing presence of aftermarket sales of DRAMs.

DRAMs are sold on both a spot and contract basis. The percentage of total sales made on a contract basis during 1991 by U.S. producers varied greatly from firm to firm. These suppliers reported using contracts for between *** percent of their sales.[49] All importers of Korean DRAMs reported that all of their sales are made on a spot basis.[50] In general, contract sales are made to the larger OEM accounts and the process of entering into agreements varies somewhat from supplier to supplier. *** reported that ***.

* * * * * * *

Suppliers are generally allowed more than one opportunity to quote on a particular order. All but one U.S. producer reported that while quoting is generally closed, they are often able to obtain information on competitive price levels. Within a given contract, producers reported that there are usually not any specific provisions for automatic price increases or decreases; however, price is often negotiable.

DRAMs are priced on a per-unit basis and are sold on an f.o.b. basis to all customers. Some suppliers reported having price lists for their sales of DRAMs. These suppliers stated that they adhere to their price lists, while others stated that prices fluctuate so rapidly that a published price list cannot be followed. *** reported that it publishes a minimum price list that is updated several times per month or as required by market conditions.

For sales to distributors, most DRAM suppliers use a policy that is known as "ship from stock and debit."[51] Suppliers generally have one price for all distributors; however, distributors often request discounts off this price in order to compete with other suppliers' offers to other distributors. A discount is usually requested after the distributor has already purchased the DRAMs for a given price. The distributor usually informs the DRAM supplier of the price at which it will be able to sell the product. If the

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[48] There has also been an increase in the number of computer manufacturers that sell on a mail-order basis. However, Micron does not believe that this has had an impact on demand and/or pricing in the DRAM market (transcript of the conference, pp. 49-50).

[49] Petitioner, Micron, reported that approximately *** percent of its sales are made on a spot basis and *** percent on a contract basis.

[50] Since all three major importers, Goldstar, Hyundai, and Samsung, reported that all of their sales are made on a spot basis, they did not provide any information on contract sales.

[51] This policy is also referred to as "meet comp" or "price protection" credits.

DRAM supplier agrees, the distributor then sells the DRAM for the specified price. The supplier will then credit the distributor's account, thus lowering the price that the distributor actually paid for the DRAMs. Since this price adjustment is made after the product has been shipped to the distributor, suppliers may not actually record the sale until the distributor ships the product to its customer.[52]

All but one supplier reported that transportation costs are not a significant factor in a customer's decision to purchase DRAMs. Although the supplier may sometimes arrange the transportation, the purchaser always pays for it. Freight costs account for less than 1 percent of the total delivered price of a DRAM. Because freight costs are not significant, DRAM suppliers can and do ship product throughout the entire United States. Leadtimes for delivery of DRAMs generally range from 1 day to 12 weeks. During the period for which information was requested, U.S. DRAM producers shipped their product as quickly as 1 day and as long as 26 weeks; importers of the Korean product reported that shipments were made within the range of 1 day to 16 weeks.

PRICE TRENDS

The Commission requested price and quantity data from U.S. producers and importers for their monthly spot and quarterly contract sales of DRAMs during January 1989-March 1992.[53] U.S. producers and importers were requested to submit separate pricing data for their sales to OEMs, franchise distributors, value-added resellers/aftermarket resellers, and brokers/independent distributors.[54] Product specifications for which pricing data were requested are as follows:

Product 1: 1 Meg x 1, 70ns 1 Meg DRAM, SOJ[55]
Product 2: 1 Meg x 1, 80ns 1 Meg DRAM, SOJ
Product 3: 1 Meg x 1, 100ns 1 Meg DRAM, SOJ
Product 4: 1 Meg x 4, 70ns 4 Meg DRAM, SOJ
Product 5: 1 Meg x 4, 80ns 4 Meg DRAM, SOJ
Product 6: 1 Meg x 4, 100ns 4 Meg DRAM, SOJ

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[52] Because of this policy, some of the monthly quantities may not correspond exactly with the prices within a given month.

[53] Only spot prices are discussed in this section; contract prices were only reported by U.S. producers and are presented in appendix F. Trends in contract sales prices to OEMs were similar to those of spot prices to OEMs.

Prices for DRAMs were requested on a monthly basis in order to capture the rapid changes in the market.

[54] In several instances, DRAM suppliers reported that the total quantity shipped in a given month was negative. This is due to DRAM suppliers accepting return merchandise from their customers either for defective product or exchanges for different product. For example, ***.

[55] SOJ ("small outline J-leaded" package) refers to a type of DRAM package. According to Micron this is one of the most common types of DRAM packaging.

Usable pricing data were received from three U.S. producers and seven importers of Korean DRAMs.[56] Reported pricing data accounted for approximately 31 and 22 percent of total shipments of U.S.-produced and Korean cased DRAMs, respectively, during 1991.

SPOT SALES OF DRAMS

Sales to OEMs

In general, weighted-average prices for both domestic and Korean DRAMs sold to OEMs declined during the period January 1989 to March 1992 (tables 30 and 31). Weighted-average f.o.b. prices for domestic 70ns, 1 Meg DRAMs (product 1) declined *** percent from January 1990 to March 1992. Similarly, prices for Korean product 1 also fell fairly steadily from July 1989 to March 1992, decreasing *** percent during that time.

Prices for domestic 80ns, 1 Meg DRAMs (product 2) fell sharply (i.e., by *** percent) from September 1989 to October 1989 and then continued to fall through March 1992; these prices were *** percent lower in March 1992 than they were in September 1989. Prices for product 2 imported from Korea declined from January 1989 to March 1992, falling *** percent during that time.

U.S. producers' prices for 100ns, 1 Meg DRAMs (product 3) decreased somewhat irregularly during the period May 1989 to March 1992, falling *** percent during that time. Prices for product 3 imported from Korea rose *** percent from January 1989 to March 1989 before falling *** percent by March 1992. Overall, these prices were *** percent lower in March 1992 than they were in January 1989.

Prices for domestic 70ns, 4 Meg DRAMs (product 4) increased *** percent from January 1991 to July 1991 before falling *** percent by March 1992. Overall, domestic prices for this product were *** percent lower in March 1992 than they were in January 1991. Prices for Korean product 4 generally decreased from January 1991 to March 1992, falling *** percent during that time.

U.S. producers' prices for 80ns, 4 Meg DRAMs (product 5) declined *** percent from February 1991 to March 1992. Prices for product 5 imported from Korea decreased steadily from August 1990 to March 1992, falling *** percent during that time.

Prices for product 6 (100ns, 4 Meg DRAM) were spotty. U.S. producers reported prices for product 6 for *** months for which data were requested. These prices *** during the period February 1991 to May 1991 but ***. Prices for Korean product 6 were only reported for ***.

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[56] IBM reportedly sells some domestically produced DRAMs on the open market (transcript of the conference, pp. 174-175). It reported ***.

Table 30
U.S. and Korean DRAMs: Weighted-average net f.o.b. selling prices and quantities of U.S.-produced and Korean products 1, 2, and 3[1] sold to OEMs, by months, January 1989-March 1992

Period	Product 1		Product 2		Product 3	
	United States	Korea	United States	Korea	United States	Korea
	*	*	*	*	*	*

[1] Product 1 is a 1 Meg by 1, 70ns, 1 Meg DRAM, SOJ. Product 2 is a 1 Meg by 1, 80ns, 1 Meg DRAM, SOJ. Product 3 is a 1 Meg by 1, 100ns, 1 Meg DRAM, SOJ.

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

Table 31
U.S. and Korean DRAMs: Weighted-average net f.o.b. selling prices and quantities of U.S.-produced and Korean products 4, 5, and 6[1] sold to OEMs, by months, January 1990-March 1992[2]

Period	Product 4		Product 5		Product 6	
	United States	Korea	United States	Korea	United States	Korea
	*	*	*	*	*	*

[1] Product 4 is a 1 Meg by 4, 70ns, 4 Meg DRAM, SOJ. Product 5 is a 1 Meg by 4, 80ns, 4 Meg DRAM, SOJ. Product 6 is a 1 Meg by 4, 100ns, 4 Meg DRAM, SOJ.
[2] No prices were reported for these products for 1989.

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

Sales to Franchise Distributors

As in the OEM market, prices for DRAMs sold to franchise distributors declined throughout the period January 1989 to March 1992 (tables 32 and 33).[57] Prices for domestic product 1 sold to franchise distributors declined *** percent from January 1990 to March 1992. Prices for product 1 imported from Korea increased *** percent from July 1989 to August 1989 before falling *** percent by March 1992. Overall, Korean prices for product 1 were *** percent lower in March 1992 than in July 1989.

Prices for U.S.-produced product 2 sold to this customer group declined from November 1989 to March 1992, falling *** percent during that time. Korean prices for product 2 decreased *** percent during January 1989 to March 1992.

[57] Because of the "ship from stock and debit" credit policies of the DRAM producers, prices for sales to distributors tend to fluctuate slightly more than those for sales to OEMs.

Table 32
U.S. and Korean DRAMs: Weighted-average net f.o.b. selling prices and quantities of U.S.-produced and Korean products 1, 2, and 3[1] sold to franchise distributors, by months, January 1989-March 1992

Period	Product 1		Product 2		Product 3	
	United States	Korea	United States	Korea	United States	Korea
	*	*	*	*	*	*

[1] Product 1 is a 1 Meg by 1, 70ns, 1 Meg DRAM, SOJ. Product 2 is a 1 Meg by 1, 80ns, 1 Meg DRAM, SOJ. Product 3 is a 1 Meg by 1, 100ns, 1 Meg DRAM, SOJ.

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

Table 33
U.S. and Korean DRAMs: Weighted-average net f.o.b. selling prices and quantities of U.S.-produced and Korean products 4 and 5[1] sold to franchise distributors, by months, January 1990-March 1992[2]

Period	Product 4		Product 5	
	United States	Korea	United States	Korea
	*	*	*	*

[1] Product 4 is a 1 Meg by 4, 70ns, 4 Meg DRAM, SOJ. Product 5 is a 1 Meg by 4, 80ns, 4 Meg DRAM, SOJ. No prices were reported for product 6.
[2] No prices were reported for these products during 1989.

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

U.S. producers' prices for product 3 sold to franchise distributors fluctuated downward from March 1989 to November 1991. Overall these prices were *** percent lower in November 1991 than in March 1989. Prices for product 3 imported from Korea also fluctuated with a downward trend from January 1989 to March 1992, falling *** percent during that time.

U.S. producers reported prices for product 4 for only *** months during the period July 1991 to March 1992. These prices were *** percent lower in ***. Prices reported for Korean product 4 declined steadily from January 1991 to March 1992, falling *** percent during that time.

Prices for product 5 sold by U.S. producers to franchise distributors generally declined from April 1991 to March 1992, falling *** percent in that period. Korean prices for product 5 also decreased during the period for which they were reported. These prices fell *** percent from August 1990 to February 1992.

Sales to Value-Added Resellers/Aftermarket Resellers

*** reported prices for sales to this customer group, and then only for product 2; importers reported prices for products 1 through 5. As in the other customer markets, prices for the various DRAMs declined during the period for which prices were reported (table 34). For product 1, Korean prices fell *** percent from May 1989 to March 1992.

For product 2, the U.S. producer's prices fell *** percent from September 1991 to March 1992. Korean prices for product 2 decreased relatively steadily from March 1989 to March 1992, falling *** percent during that period.

Prices for Korean product 3 declined *** percent from February 1989 to March 1992. Prices for product 4 imported from Korea fell *** percent from January 1991 to March 1992. Similarly, prices for Korean product 5 decreased fairly steadily from July 1990 to March 1992, falling *** percent during that period.

Sales to Brokers/Independent Distributors

Weighted average f.o.b. prices for sales to brokers or independent distributors were reported only by U.S. importers of the Korean product. In all cases, prices declined over the period (table 35). Korean prices for products 1, 2, and 3 decreased *** percent, respectively.[58] Prices for products 4 and 5 imported from Korea decreased *** percent, respectively.[59]

PRICE COMPARISONS

In the OEM market, 100 comparisons between U.S. prices and Korean prices were possible. In 47 of these comparisons, the Korean product undersold the domestic product, with margins ranging from 0.1 to 28.0 percent (table 36). In 48 instances, the Korean product was priced above the domestic product; margins ranged from 0.3 to 69.2 percent. In the remaining five instances, the two products had the same price.

In the franchise distributor market, 67 comparisons between U.S. prices and Korean prices were possible. In 23 of these comparisons, the Korean product undersold the domestic product, with margins ranging from 0.7 to 53.0 percent. In 42 instances, the Korean product was priced above the domestic product; margins ranged from 0.1 to 66.7 percent. In the remaining two instances, the two products had the same price.

In the value-added reseller/aftermarket reseller market, six price comparisons were possible. In one of these, the Korean product was priced *** percent lower than the domestic product. In four comparisons, the Korean product was priced between 0.1 and 7.4 percent above the domestic product. In the remaining instance, the two products had the same price.

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[58] Prices for products 1 and 2 were reported for the period January 1989 to March 1992. For product 3, prices were reported for the period January 1989 to September 1991.

[59] Prices for product 4 were reported for the period January 1991 to March 1992. Prices for product 5 were reported for July 1990 to March 1992.

Table 34
U.S. and Korean DRAMs: Weighted-average net f.o.b. selling prices and quantities of U.S.-produced and Korean products 1, 2, 3, 4, and 5[1] sold to value-added resellers/aftermarket resellers, by months, January 1989-March 1992

Period	Product 1	Product 2	Product 3	Product 4	Product 5
	*	*	*	*	*	*	*

[1] Product 1 is a 1 Meg by 1, 70ns, 1 Meg DRAM, SOJ. Product 2 is a 1 Meg by 1, 80ns, 1 Meg DRAM, SOJ. Product 3 is a 1 Meg by 1, 100ns, 1 Meg DRAM, SOJ. Product 4 is a 1 Meg by 4, 70ns, 4 Meg DRAM, SOJ. Product 5 is a 1 Meg by 4, 80ns, 4 Meg DRAM, SOJ.

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

Table 35
Korean DRAMs: Weighted-average net f.o.b. selling prices and quantities of products 1, 2, 3, 4, and 5[1] sold to brokers/independent distributors, by months, January 1989-March 1992

Period	Product 1	Product 2	Product 3	Product 4	Product 5
	*	*	*	*	*	*	*

[1] Product 1 is a 1 Meg by 1, 70 ns, 1 Meg DRAM, SOJ. Product 2 is a 1 Meg by 1, 80ns, 1 Meg DRAM, SOJ. Product 3 is a 1 Meg by 1, 100ns, 1 Meg DRAM, SOJ. Product 4 is a 1 Meg by 4, 70ns, 4 Meg DRAM, SOJ. Product 5 is a 1 Meg by 4, 80ns, 4 Meg DRAM, SOJ.

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

Table 36
U.S. and Korean DRAMs: Margins of under/(over)selling for sales of products 1, 2, 3, 4, 5, and 6 sold to original equipment manufacturers, franchise distributors, and value-added/aftermarket resellers, by months, January 1989-March 1992

(In percent)

Period	Sales to OEMs	Sales to franchise distributors	Sales to VAR[2]
	*	*	*	*	*	*	*

[1] Product 1 is a 1 Meg by 1, 70 ns, 1 Meg DRAM, SOJ. Product 2 is a 1 Meg by 1, 80 ns, 1 Meg DRAM, SOJ. Product 3 is a 1 Meg by 1, 100 ns, 1 Meg DRAM, SOJ. Product 4 is a 1 Meg by 4, 70ns, 4 Meg DRAM, SOJ. Product 5 is a 1 Meg by 4, 80ns, 4 Meg DRAM, SOJ. Product 6 is a 1 Meg by 4, 100ns, 4 Meg DRAM, SOJ.
[2] This column represents sales to value-added/aftermarket resellers.

Note.--Percentage margins are calculated from unrounded figures; thus, margins cannot always be directly calculated from the rounded figures in the table.

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

Exchange Rates

Quarterly data reported by the International Monetary Fund indicate that during January-March 1989 through January-March 1992 the nominal value of the Korean won fluctuated, depreciating overall by 11.6 percent relative to the U.S. dollar (table 37).[60] Adjusted for movements in producer price indexes in the United States and Korea, the real value of the Korean currency depreciated by 5.1 percent overall between January-March 1989 and the first quarter of 1992.

Table 37
Exchange rates:[1] Indexes of nominal and real exchange rates of the Korean won and indexes of producer prices in the United States and Korea,[2] by quarters, January 1989-March 1992

Period	U.S. producer price index	Korean producer price index	Nominal exchange rate index	Real exchange rate index[3]
1989:				
Jan.-Mar.....	100.0	100.0	100.0	100.0
Apr.-June.....	101.8	100.8	101.6	100.6
July-Sept.....	101.4	100.7	101.3	100.6
Oct.-Dec.....	101.8	101.2	100.7	100.1
1990:				
Jan.-Mar.....	103.3	101.8	98.1	96.7
Apr.-June.....	103.1	104.0	95.4	96.3
July-Sept.....	104.9	105.5	94.7	95.2
Oct.-Dec.....	108.1	108.2	94.7	94.8
1991:				
Jan.-Mar.....	105.9	109.8	93.9	97.3
Apr.-June.....	104.8	110.0	93.4	98.0
July-Sept.....	104.7	110.6	92.4	97.7
Oct.-Dec.....	104.8	111.5	89.9	95.7
1992:				
Jan.-Mar.....	104.6	112.3[4]	88.4	94.9[4]

[1] Exchange rates expressed in U.S. dollars per Korean won.
[2] Producer price indexes--intended to measure final product prices--are based on period-average quarterly indexes presented in line 63 of the International Financial Statistics.
[3] The real exchange rate is derived from the nominal rate adjusted for relative movements in producer prices in the United States and Korea.
[4] Derived from Korean price data reported for January-February only.

Note.--January-March 1989 = 100.

Source: International Monetary Fund, International Financial Statistics, May 1992.

[60] International Monetary Fund, International Financial Statistics, May 1992.

Lost Sales and Revenues

The Commission received lost-sale and lost-revenue allegations from *** U.S. DRAM producers, ***. The 32 lost-sale allegations totaled approximately *** and involved *** DRAMs allegedly purchased from Korean suppliers during the period January 1989 to March 1992. The 57 lost-revenue allegations totaled *** and involved *** DRAMs. Staff contacted *** purchasers who accounted for 18 of the allegations. A summary of the information obtained follows.

*** was named by *** in *** lost-revenue allegations that totaled *** and involved *** DRAMs. *** stated that he was not sure if the price decreases in the market were caused by Korean suppliers. *** reported that *** is a difficult company to deal with and *** tend to cater to the few big computer companies rather than pursuing the business of smaller companies such as ***. *** stated that *** purchases Korean DRAMs because of better availability and more consistent supply. For ***, delivery and availability are very important. *** also added that *** has been very aggressive on price, particularly in the 1 Meg DRAM market. According to ***, it is a well known fact that *** tends to have "fire sales" on its products at the end of the month. *** purchases shrink DRAMs; these products are generally faster and lower-priced.[61]

*** alleged that it lost revenues on *** separate sales to *** allegedly due to competition from Korean products; these allegations involved *** DRAMs and totaled ***. *** provided information on his firm's purchases of DRAMs. *** stated that *** previously purchased DRAMs from *** and that during that time frame did not ask *** to lower its prices. *** reported that *** prices for its DRAMs are currently higher than other suppliers in the market. In the past few years, *** prices for DRAMs were generally a couple of percentage points above Korean prices. *** stated that *** stopped buying from *** because the price differential had increased to 10-15 percent above Korean prices. According to ***, *** previously had a policy of cleaning out its inventory at the end of a month, usually at very low prices; however, in the past 4 or 5 months, *** has not followed this policy. *** also added that overall prices for DRAMs have dropped during the past few years but he did not feel that prices were dramatically lower than they normally would be.

*** named *** in *** lost-sales allegations and *** lost-revenue allegation. The *** lost-sales allegations totaled *** and involved *** DRAMs, while the lost-revenue allegation totaled *** and involved *** DRAMs. *** reported that ***; the majority of *** purchases are of *** DRAMs. *** stated that although *** has not purchased any Korean product, he is aware of the low prices that they offer in the marketplace. According to ***, all DRAM suppliers, ***, are reducing prices but U.S. and other suppliers are not keeping pace with the reductions in price of the Korean suppliers. *** also commented that *** has lost customers to Korean DRAM suppliers because of the low prices that they offer.

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[61] *** stated that companies are able to offer a faster product for a lower price because they are smaller and the producer can produce more of them on the same size silicon wafer.

*** alleged that it lost revenues of *** on *** separate sales of *** DRAMs to *** due to competition from Korean products. *** stated that he has asked for lower prices from both *** and the Korean suppliers at different times, using the firm with the lowest price as the bargaining tool. *** reported that *** purchases DRAMs from *** and that all of these firms have had the lowest price at different times.[62] According to ***, all DRAM suppliers generally try to get rid of any extra inventory at the end of the month; therefore, firms with high end-of-month inventories will tend to sell DRAMs at low prices. *** stated that he often waits until the end of the month to purchase DRAMs in order to get the lower prices. *** also stated that *** service and the quality of its product have always been acceptable to ***; the only complaint that *** has is with ***.

[62] *** also commented that *** tends to be higher-priced than the firms from whom he purchases DRAMs.

APPENDIX A

FEDERAL REGISTER NOTICES

INTERNATIONAL TRADE COMMISSION

[Investigation No. 731-TA-556 (Preliminary)]

Dynamic Random Access Memories of One Megabit and Above From the Republic of Korea

AGENCY: United States International Trade Commission.

ACTION: Institution and scheduling of a preliminary antidumping investigation.

SUMMARY: The Commission hereby gives notice of the institution of preliminary antidumping investigation No. 731-TA-556 (Preliminary) under section 733(a) of the Tariff Act of 1930 (19 U.S.C. 1673b(a)) to determine whether there is a reasonable indication that an industry in the United States is materially injured, or is threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of imports from the Republic of Korea (Korea) of dynamic random access memories (DRAMs) of one megabit (Meg) [1] and above,[2] which are currently provided for in statistical reporting numbers 8542.11.00.24, 8542.11.00.26, 8542.11.00.34, and 8542.11.00.01 of the Harmonized Tariff Schedule of the United States Annotated,[3] that are alleged to be sold in the United States at less than fair value. The Commission must complete preliminary antidumping investigations in 45 days, or in this case by June 8, 1992.

For further information concerning the conduct of this investigation 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 B (19 CFR part 207).

EFFECTIVE DATE: April 22, 1992.

[1] The petition states that 1 Meg equals approximately 1,045,376 bits. Technical references equate 1 Meg to 1,048,576 bits.

[2] The imported merchandise which is the subject of this petition is all 1 Meg and above DRAM semiconductors, whether assembled or unassembled. The products covered by this petition thus include processed wafers, uncut die, cut die, and assembled 1 Meg and above DRAMs produced in Korea and imported directly or indirectly into the United States. Processed wafers produced in Korea and further processed into finished or semi-finished 1 Meg and above DRAMs in a third country before exportation to the United States are included in the scope of this petition, as are finished or semi-finished DRAMs assembled in Korea from wafers produced in another country. The scope of this petition includes memory modules, such as Single In-Line Processing Modules (SIPs) and Single In-Line Memory Modules (SIMMs), containing more than one 1-Meg or above DRAMs mounted on their own small printed circuit board, as well as memory cards, which are memory modules about the size of a credit card which are designed to be easily inserted into portable computers, printers, and similar applications. The scope of this petition also includes so-called video random access memory (VRAM) which is DRAM designed to improve the video performance of computers. Finally, the scope of this petition also covers any future packaging and assembling of DRAMs.

[3] Prior to 1991, finished 1 Meg and above DRAMs (including SRAMs) were provided for in statistical reporting number 8542.11.00.35 of the HTS Annotated. Unassembled 1 Meg and above DRAMs, including unmounted chips, wafers, and dice were provided for in statistical reporting number 8542.11.00.02 of the HTS Annotated.

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

SUPPLEMENTARY INFORMATION:

Background

This investigation is being instituted in response to a petition filed on April 22, 1992, by counsel on behalf of Micron Technology, Inc., Boise, ID.

Participation in the Investigation and Public Service List

Persons (other than petitioners) wishing to participate in the investigation as parties must file an entry of appearance with the Secretary to the Commission, as provided in §§ 201.11 and 207.10 of the Commission's rules, not later than seven (7) days after publication of this notice in the **Federal Register**. The Secretary will prepare a public service list containing the names and addresses of all persons, or their representatives, who are parties to this investigation upon the expiration of the period for filing entries of appearance.

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 this preliminary investigation available to authorized applicants under the APO issued in the investigation, provided that the application is made not later than seven (7) days after the publication of this notice in the **Federal Register**. A separate service list will be maintained by the Secretary for those parties authorized to receive BPI under the APO.

Conference

The Commission's Director of Operations has scheduled a conference in connection with this investigation for 9:30 a.m. on May 13, 1992, at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC. Parties wishing to participate in the conference should contact Mary Trimble (202-205-3193) not later than May 11, 1992, to arrange for their appearance.

Parties in support of the imposition of antidumping duties in this investigation and parties in opposition to the imposition of such duties will each be collectively allocated one hour within which to make an oral presentation at the conference. A nonparty who has testimony that may aid the Commission's deliberations may request permission to present a short statement at the conference.

Written Submissions

As provided in §§ 201.8 and 207.15 of the Commission's rules, any person may submit to the Commission on or before May 18, 1992, a written brief containing information and arguments pertinent to the subject matter of the investigation. Parties may file written testimony in connection with their presentation at the conference no later than three (3) days before the conference. If briefs or written testimony contain BPI, they must conform with the requirements of §§ 201.6, 207.3, and 207.7 of the Commission's rules.

In accordance with §§ 201.16(c) and 207.3 of the 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 the Tariff Act of 1930, title VII. This notice is published pursuant to § 207.12 of the Commission's rules.

Issued: April 24, 1992.

By order of the Commission.

Kenneth R. Mason,

Secretary.

[FR Doc. 92-9978 Filed 4-28-92; 8:45 am]

BILLING CODE 7020-02-M

[A-580-812]

Initiation of Antidumping Duty Investigation: Dynamic Random Access Memory Semiconductors of One Megabit and Above From the Republic of Korea

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

EFFECTIVE DATE: May 19, 1992.

FOR FURTHER INFORMATION CONTACT: John Beck, Office of Antidumping Investigations, Import Administration, International Trade Administration, U.S. Department of Commerce, 14th Street and Constitution Avenue, NW., Washington, DC 20230; telephone (202) 377-3464.

INITIATION OF INVESTIGATION:

The Petition

On April 22, 1992, we received a petition filed in proper form by Micron Technology, Inc. (petitioner). A supplement to the petition was received on May 11, 1992. In accordance with 19 CFR 353.12, the petitioner alleges that dynamic random access memory semiconductors of one megabit and above (DRAMs) from the Republic of Korea (Korea) are being, or are likely to be, sold in the United States at less than fair value within the meaning of section 731 of the Tariff Act of 1930, as amended (the Act), the that these imports are materially injuring, or threaten material injury to, a U.S. industry.

The petitioner has stated that it has standing to file the petition because it is an interested party, as defined under section 771(9)(C) of the Act, and because the petition was filed on behalf of the U.S. industry producing the product subject to this investigation. If any interested party, as described under paragraphs (C), (D), (E), or (F) of section 771(9) of the Act, wishes to register support for, or opposition to, this petition, it should file a written notification with the Assistant Secretary for Import Administration.

Under the Department's regulations, any producer or reseller seeking exclusion from a potential antidumping duty order must submit its request for exclusion within 30 days of the date of the publication of this notice. The procedures and requirements are contained in 19 CFR 353.14.

Scope of Investigation

For purposes of this investigation, DRAMs are all one megabit and above dynamic random access memory semiconductors, whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut die and cut die. Processed wafers produced in Korea but packaged in a third country are included in the scope; however, wafers produced in a third country and assembled or packaged in Korea are not included in the scope. The scope includes memory modules, such as Single In-Line Processing Modules (SIPs) and Single In-Line Memory Modules (SIMMs), that contain one megabit or above dynamic random access memory semiconductors that are assembled together and function as memory. Modules that contain other parts that are needed to support the function of memory are considered to be covered memory modules. Only those modules which contain additional items which alter the function of the module to something other than memory are not-covered modules. The scope also includes video dynamic random access memory (VRAMs), as well as any future packaging and assembling of DRAMs. During this investigation, we will continue to consider this definition of the scope and will refine it if necessary. The DRAMs subject to this investigation are classifiable under subheadings 8473.30.4000, 8542.11.0001, 8542.11.0024, 8542.11.0026 and 8542.11.0034 of the Harmonized Tariff Schedule of the United States (HTS). Although the HTS subheadings are provided for convenience and customs purposes, our written description of the scope of this investigation is dispositive.

United States Price and Foreign Market Value

Petitioner based United States price (USP) on observed price quotes of DRAMs by distributors in the United States. Petitioner made deductions from USP for the distributors' markup and movement expenses.

To demonstrate home market price, petitioner supplied: (1) Average home market prices obtained by Dataquest; and (2) company-specific home market price quotes obtained by an unidentified firm. Petitioner also calculated the cost of production (COP) and constructed value (CV) of one megabit and four megabit DRAMs for each Korean manufacturer.

Petitioner alleges that Hyundai, Goldstar and Samsung, potential respondents in this investigation, are selling DRAMs in Korea at prices below their COP. Therefore, petitioner claims that such sales are inadequate bases for calculating the foreign market value (FMV). Petitioner thus calculated FMV on the basis of CV. COP and CV for each company was based on a cost model developed by VLSI Research using company-specific data for die size, number of masking steps, and yields. The cost model was correlated to petitioner's actual costs and determined to be reasonable. Petitioner was unable to include in its estimates of COP respondent-specific amounts for selling, general and administrative expenses (SG&A), because the cost model did not separately report such expenses. However, Samsung's financial statements report SG&A which is reasonable in comparison to petitioner's SG&A. Financial statements for Hyundai and Goldstar were not available. In developing CVs, petitioner added the statutory eight percent for profit.

Based on the information presented, we have reason to believe or suspect that the home market sales of Hyundai, Goldstar and Samsung are being made at less than COP. Accordingly, pursuant to section 773(b) of the Act,and 19 CFR 353.51, we are initiating COP investigations for the home market sales of Hyundai, Goldstar and Samsung.

The range of dumping margins of DRAMs based on a comparison of USP to CV alleged by petitioner is 94.29%—170.89% (one meg) and 278.63%—282.51% (four meg) for Hyundai, 132.11%—165.29% (one meg) and 273.25% (four meg) for Goldstar, and 0.62%—3.83% (one meg) and 93.18%—97.39% (four meg) for Samsung.

Initiation of Investigation

We have examined the petition on DRAMs from Korea and have found that the petition meets the requirements of section 732(b) of the Act. Therefore, we are initiating an antidumping duty investigation to determine whether imports of DRAMs from Korea are being, or are likely to be, sold in the United States at less than fair value.

Preliminary Determination by the International Trade Commission

The International Trade Commission (ITC) will determine by June 8, 1992, whether there is a reasonable indication that imports of DRAMs from Korea are materially injuring, or threaten material injury to, a U.S. industry. A negative ITC determination will result in the investigation being terminated; otherwise, the investigation will proceed according to statutory and regulatory time limits.

This notice is published pursuant to section 732(c)(2) of the Act and 19 CFR 353.13(b).

Dated: May 12, 1992.

Francis J. Sailer,

Acting Assistant Secretary for Import Administration.

[FR Doc. 92-11728 Filed 5-18-92; 8:45 am]

BILLING CODE 3510-DS-M

APPENDIX B

LIST OF WITNESSES

CALENDAR OF THE PUBLIC CONFERENCE

Investigation No. 731-TA-556 (Preliminary)

DYNAMIC RANDOM ACCESS MEMORIES OF ONE MEGABIT AND ABOVE
FROM THE REPUBLIC OF KOREA

Those listed below appeared at the United States International Trade Commission's conference held in connection with the subject investigation on May 13, 1992, in Hearing Room 101 of the USITC Building, 500 E Street, SW., Washington, DC.

In support of the imposition of antidumping duties

Hale & Dorr--Counsel
Washington, DC
on behalf of--

Micron Technology, Inc.

James W. Garrett, Vice Chairman, Micron Technology, Inc.

Reid N. Langrill, Vice President, Finance and Chief Financial Officer, Micron Technology, Inc.

William F. Finan, Technecon Analytic Research, Inc.

Gilbert B. Kaplan)
Paul W. Jameson) --OF COUNSEL

In opposition to the imposition of antidumping duties

Akin, Gump, Hauer & Feld--Counsel
Donovan, Leisure, Rogovin, Huge & Schiller--Counsel
Washington, DC
on behalf of--

Samsung Electronics Co. Ltd.; Samsung Semiconductors, Inc.; Goldstar Electron Co., Ltd.; Goldstar Electron of America, Inc.; Hyundai Electronics Industries Co., Ltd.; and Hyundai Electronics America, Inc.

Keith McDonald, Vice President, Samsung Semiconductors, Inc.

Stanley Katz, Vice President, Sales and Marketing, Hyundai Electronics America, Inc.

Alan Portnoy, Executive Vice President and General Manager, Goldstar Electron of America, Inc.

William H. Fearing, Sales Manager, Memory Products

Michael Freie, President, U.S. Modules

Chaz Haba, Chairman, Bell Computer

Seth Kaplan, Trade Resources Group

Sukhan Kim)
Spencer S. Griffith) --OF COUNSEL

Raymond Paretzky)
Michael P. House) --OF COUNSEL

Brian Turner, President, The Chip Merchant

Charles Duke, Counsel, The Chip Merchant

APPENDIX C

SUPPLEMENTAL DATA CONCERNING DRAMS BY DENSITY

Table C-1
DRAMs of less than 256K, cased: U.S. producers' U.S. shipments, U.S. shipments of imports, and apparent U.S. consumption, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] The U.S. producers' data presented are from *** and the U.S. importers' data presented are from ***, *** of which import cased DRAMs of less than 256K from Korea.

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

Table C-2
256K DRAMs, cased: U.S. producers' U.S. shipments, U.S. shipments of imports, and apparent U.S. consumption, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] The data presented are from *** U.S. producers of 256K DRAMs and from *** U.S. importers of cased 256K DRAMs, *** of which import from Korea.

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

Table C-3
1 Meg DRAMs, cased: U.S. producers' U.S. shipments, U.S. shipments of imports, and apparent U.S. consumption, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] The data presented are from *** U.S. producers of 1 Meg DRAMs and from *** U.S. importers of cased 1 Meg DRAMs, *** of which import from Korea.

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

Table C-4
4 Meg DRAMs, cased: U.S. producers' U.S. shipments, U.S. shipments of imports, and apparent U.S. consumption, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
	*	*	*	*	*

[1] The data presented are from *** U.S. producers of 4 Meg DRAMs and from *** U.S. importers of cased 4 Meg DRAMs, *** of which import from Korea.

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

Table C-5
DRAMs, cased and uncased: U.S. production, by densities and by firms, 1989-91, January-March 1991, and January-March 1992

(1,000 units)

Item	1989	1990	1991	January-March-- 1991	1992
	*	*	*	*	*

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

Table C-6
DRAMs of less than 256K, cased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
	*	*	*	*	*

[1] Data presented are from ***.

Note.--Because of rounding, bit 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 C-7
256K DRAMs, cased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

Note.--Because of rounding, bit 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 C-8
1 Meg DRAMs, cased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

Note.--Because of rounding, bit 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 C-9
4 Meg DRAMs, cased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

Note.--Because of rounding, bit 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 C-10
DRAMs of less than 256K, uncased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

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

Table C-11
256K DRAMs, uncased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

Note.--Because of rounding, bit 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 C-12
1 Meg DRAMs, uncased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

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

Table C-13
4 Meg DRAMs, uncased: U.S. producers' shipments, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

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

Table C-14
DRAMs, cased: End-of-period inventories of U.S. producers, by densities, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

Note.--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.

Table C-15
DRAMs, uncased: End-of-period inventories of U.S. producers, by densities, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. producers of DRAMs.

Note.--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.

Table C-16
DRAMs, cased: U.S. importers' end-of-period inventories of Korean product, by densities, 1989-91, January-March 1991, and January-March 1992[1]

(In thousands of units)

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are from *** U.S. importers of cased DRAMs from Korea.

Note.--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.

Table C-17
DRAMs of less than 256K, cased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importers of cased DRAMs of less than 256K, *** of which import from Korea.

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

Table C-18
256K DRAMs, cased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importers of 256K cased DRAMs, *** of which import from Korea.

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

Table C-19
1 Meg DRAMs, cased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importers of 1 Meg cased DRAMs, *** of which import from Korea.

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

Table C-20
4 Meg DRAMs, cased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importers of 4 Meg cased DRAMs, *** of which import from Korea.

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

Table C-21
16 Meg DRAMs, cased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importers of 16 Meg cased DRAMs, *** of which imports from Korea.

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

Table C-22
DRAMs of less than 256K, uncased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importers of uncased DRAMs of less than 256K. *** imports of uncased DRAMs from Korea were reported.

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

Table C-23
256K DRAMs, uncased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importer of 256K uncased DRAMs. *** imports of uncased DRAMs from Korea were reported.

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

Table C-24
1 Meg DRAMs, uncased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importers of 1 Meg uncased DRAMs. *** imports of uncased DRAMs from Korea were reported.

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

Table C-25
4 Meg DRAMs, uncased: U.S. imports, by sources, 1989-91, January-March 1991, and January-March 1992[1]

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] Data presented are reported by *** U.S. importers of 4 Meg uncased DRAMs. *** imports of uncased DRAMs from Korea were reported.

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

Table C-26
DRAMs, cased: U.S. shipments of Korean imports[1] as a share of apparent U.S. consumption, by densities, 1989-91, January-March 1991, and January-March 1992[2]

(In percent)

Item	1989	1990	1991	January-March-- 1991	1992
*	*	*	*	*	*

[1] The subject imports are 1 Meg and above DRAMs from Korea.
[2] Data concerning DRAMs produced in countries other than the United States and Korea are not presented due to the inability to determine the country of origin of the wafer fabrication.

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

APPENDIX D

UNIT PRODUCTION COSTS AND SOURCES

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APPENDIX E

COMMENTS RECEIVED FROM U.S. PRODUCERS ON THE IMPACT OF IMPORTS OF 1 MEG AND ABOVE DRAMS FROM KOREA ON THEIR GROWTH, INVESTMENT, ABILITY TO RAISE CAPITAL, AND/OR EXISTING DEVELOPMENT AND PRODUCTION EFFORTS

COMMENTS RECEIVED FROM U.S. PRODUCERS ON THE IMPACT OF IMPORTS OF 1 MEG AND ABOVE DRAMS FROM KOREA ON THEIR GROWTH, INVESTMENT, ABILITY TO RAISE CAPITAL, AND/OR EXISTING DEVELOPMENT AND PRODUCTION EFFORTS

The Commission requested U.S. producers to describe any actual or anticipated negative effects of imports of 1 Meg and above DRAMs from Korea on their growth, investment, ability to raise capital, and/or existing development and production efforts, including efforts to develop a derivative or more advanced version of the product. ***. The remaining responses are as follows:

Actual Negative Effects

* * * * * * *

Anticipated Negative Effects

* * * * * * *

Influence of Imports on Capital Investment

* * * * * * *

APPENDIX F

CONTRACT PRICES FOR SALES TO ORIGINAL EQUIPMENT MANUFACTURERS

Table F-1
DRAMs: U.S. producers' weighted-average net f.o.b. selling contract prices and quantities of products 1, 2, 3, 4, 5, and 6[1] sold to original equipment manufacturers, by months, January 1989-March 1992

Period	Product 1	Product 2	Product 3	Product 4	Product 5	Product 6
	*	*	*	*	*	*

[1] Product 1 is a 1 Meg by 1, 70ns, 1 Meg DRAM, SOJ. Product 2 is a 1 Meg by 1, 80ns, 1 Meg DRAM, SOJ. Product 3 is a 1 Meg by 1, 100ns, 1 Meg DRAM, SOJ. Product 4 is a 1 Meg by 4, 70ns, 4 Meg DRAM, SOJ. Product 5 is a 1 Meg by 4, 80ns, 4 Meg DRAM SOJ. Product 6 is a 1 Meg by 4, 100ns, 4 Meg DRAM SOJ.

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