

UNITED STATES INTERNATIONAL TRADE COMMISSION

DRAMS OF ONE MEGABIT AND ABOVE FROM TAIWAN

Investigation No. 731-TA-811 (Final)

DETERMINATION AND VIEWS OF THE COMMISSION

(USITC Publication No. 3256, December 1999)

## VIEWS OF THE COMMISSION

Based on the record in this investigation, we find that an industry in the United States is not materially injured or threatened with material injury by reason of imports of dynamic random access memory semiconductors (“DRAMs”) from Taiwan that the Department of Commerce (“Commerce”) has found are sold in the United States at less than fair value (“LTFV”).<sup>1</sup>

### **I. DOMESTIC LIKE PRODUCT AND INDUSTRY**

#### **A. In General**

To determine whether an industry in the United States is materially injured or threatened with material injury by reason of imports of the subject merchandise, the Commission first defines the “domestic like product” and the “industry.”<sup>2</sup> Section 771(4)(A) of the Tariff Act of 1930, as amended (“the Act”), defines the relevant domestic industry as the “producers as a [w]hole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product.”<sup>3</sup> In turn, the Act defines “domestic like product” as: “a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation . . . .”<sup>4</sup>

The decision regarding the appropriate domestic like product(s) in an investigation is a factual determination, and the Commission has applied the statutory standard of “like” or “most similar in characteristics and uses” on a case-by-case basis.<sup>5</sup> No single factor is dispositive, and the Commission may consider other factors it deems relevant based on the facts of a particular investigation.<sup>6</sup> The Commission looks for clear dividing lines among possible like products, and disregards minor variations.<sup>7</sup>

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<sup>1</sup> Chairman Bragg dissenting. *See* her Dissenting Views. Commissioners Crawford and Askey did not participate in this determination.

<sup>2</sup> 19 U.S.C. § 1677(4)(A).

<sup>3</sup> 19 U.S.C. § 1677(4)(A).

<sup>4</sup> 19 U.S.C. § 1677(10).

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

<sup>6</sup> *See, e.g., S. Rep. No. 96-249*, at 90-91 (1979).

<sup>7</sup> *Nippon Steel*, 19 CIT at 455; *Torrington*, 747 F. Supp. at 748-49. *See also S. Rep. No. 96-249* at 90-91 (1979) (Congress has indicated that the like product standard should not be interpreted in “such a narrow fashion as to permit minor differences in physical characteristics or uses to lead to the conclusion that the product and article are not ‘like’ each other, nor should the definition of ‘like product’ be interpreted in such a fashion as to

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Although the Commission must accept the determination of Commerce as to the scope of the imported merchandise allegedly sold at LTFV, the Commission determines what domestic product is like the imported articles Commerce has identified.<sup>8</sup>

## **B. Product Description**

In its final determination, Commerce defined the imported merchandise within the scope of this investigation as follows:

DRAMs from Taiwan, whether assembled or unassembled. Assembled DRAMs include all package types. Unassembled DRAMs include processed wafers, uncut die, and cut die. Processed wafers fabricated in Taiwan, but packaged or assembled into finished semiconductors in a third country are included in the scope. Wafers fabricated in a third country and assembled or packaged in Taiwan are not included in the scope.

The scope of this investigation includes memory modules. A memory module is a collection of DRAMs the sole function of which is memory. Modules include single in-line processing modules (“SIPS”), single in-line memory modules (“SIMMs”), dual in-line memory modules (“DIMMS”), memory cards or other collections of DRAMs whether mounted or unmounted on a circuit board. Modules that contain other parts that are needed to support the function of memory are covered. Only those modules that contain additional items that alter the function of the module to something other than memory, such as video graphics adapter (“VGA”) boards and cards, are not included in the scope. Modules containing DRAMs made from wafers fabricated in Taiwan, but either assembled or packaged into finished semiconductors in a third country, are also included in the scope.

The scope also includes, but is not limited to, video RAM (“VRAM”), Windows RAM (“WRAM”), synchronous graphics RAM (“SGRAM”), as well as various types of DRAMs, including fast pagemode (“FPM”), extended data-out (“EDO”), burst extended data-out (“BEDO”), synchronous dynamic RAM (“SDRAMs”), and “Rambus” DRAMs (“RDRAMs”). The scope of this investigation also includes any future density, packaging or assembling of DRAMs. Also included in the scope of this investigation are removable memory modules placed on motherboards, with or without a central processing unit (CPU), unless the importer of the motherboards certifies with Customs that neither it, nor a party related to it or under contract to it, will remove the modules from the motherboards after importation. The scope of this investigation does not include DRAMs or memory modules that are reimported for repair or replacement.

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<sup>7</sup> (...continued)

prevent consideration of an industry adversely affected by the imports under consideration.”).

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

The DRAMs subject to this investigation are currently classifiable under subheadings 8542.13.80.05, 8542.13.80.24 through 8542.13.80.34 of the Harmonized Tariff Schedule of the United States (“HTSUS”). Also included in the scope are Taiwanese DRAM modules, described above, entered into the United States under subheading 8473.30.10 of the HTSUS or possibly other HTSUS numbers. Although the subheadings are provided for convenience and customs purposes, the written description of the scope of this investigation is dispositive.<sup>9</sup>

DRAM is a class of volatile semiconductor memory that allows data to be both read from and written to the device’s storage locations in a non-linear fashion.<sup>10</sup> DRAMs and DRAM modules (collections of DRAMs mounted on a printed circuit board) are used as the main memory in a variety of electronic products including computers and computer peripherals, telecommunications equipment, networking equipment, and consumer electronics devices. By far, the largest use for DRAMs and DRAM modules is as the main memory in computer equipment.<sup>11</sup> DRAMs vary in their memory capacity or “density” (*e.g.*, 4 megabit (“Mb”), 16 Mb, 64 Mb) and addressing technology (*e.g.*, FPM, EDO, synchronous).<sup>12</sup> There are also certain specialty DRAM products, such as video RAM (VRAM), Windows RAM (WRAM), and synchronous graphics RAM (SGRAM) whose functions have been optimized for use in particular applications, but which account for a relatively small share of the total DRAM market.<sup>13</sup>

During the design phase of the DRAM manufacturing process, circuit patterns are transferred to glass photomasks, one for each layer of the DRAM.<sup>14</sup> The fabrication phase of the DRAM production process entails the repeated use of photomasks and photolithographic and etching equipment to “expose” multiple layers of microscopic circuit patterns onto the surface of a wafer of highly-purified silicon.<sup>15</sup> The assembly and test stage includes the separation of the wafer into individual dice or chips, wire bonding metal leadframes to the chips, solder plating the metal leads, trimming and forming the leads into a desired shape, encapsulating (casing) the chips in either plastic or ceramic, final testing, and marking for identification purposes.<sup>16</sup> While some cased DRAMs are sold individually, others are incorporated into modules. Module production involves the attachment of DRAMs and other components to a printed circuit board, which can then be attached to a PC motherboard.<sup>17</sup>

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<sup>9</sup> 64 Fed. Reg. 56308, 56309 (Oct. 19, 1999).

<sup>10</sup> Confidential Report (“CR”) at I-5, Public Report (“PR”) at I-4.

<sup>11</sup> CR at I-8, PR at I-6. It is estimated that between 75 and 90 percent of DRAMs consumed in the United States are ultimately incorporated into computer systems. CR at I-8 n.20, PR at I-6 n.20.

<sup>12</sup> Addressing technology controls the speed at which DRAM memory is accessed by a microprocessor. CR at I-6-I-7, PR at I-5-I-6.

<sup>13</sup> CR at I-7, PR at I-5-I-6.

<sup>14</sup> CR at I-8, PR at I-7.

<sup>15</sup> CR at I-8-I-9, PR at I-7.

<sup>16</sup> CR at I-9, PR at I-7.

<sup>17</sup> CR at I-11, PR at I-8.

### C. Like Product Issues in This Investigation

In its preliminary determination in this investigation, the Commission found a single domestic like product consisting of all DRAMs regardless of density, including cased or uncased DRAMs, DRAMs assembled into memory modules, and specialty DRAMs.<sup>18</sup> In this final phase, petitioner<sup>19</sup> and respondents<sup>20</sup> all support the Commission's preliminary like product determination.<sup>21</sup> In the absence of evidence or argument to the contrary in the final phase, we readopt the domestic like product analysis from the Commission's preliminary determination and find a single domestic like product consisting of all DRAMs, regardless of density, including cased or uncased DRAMs, DRAMs assembled into memory modules, and specialty DRAMs.

### D. Domestic Industry

The domestic industry is defined as "the producers as a [w]hole of a domestic like product . . . ."<sup>22</sup> In defining the domestic industry, the Commission's general practice has been to include in the industry all of the domestic production of the like product, whether toll-produced, captively consumed, or sold in the domestic merchant market.<sup>23</sup>

In its preliminary determination, the Commission found that the domestic industry producing DRAMs consists of fabricators and assemblers of DRAMs, but not module assemblers or fabless design houses.<sup>24</sup> In the final phase, petitioner argues that assembly constitutes domestic production only when performed by a domestic fabricator on domestic dice, and that neither module assemblers nor fabless design

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<sup>18</sup> DRAMs of One Megabit and Above from Taiwan, Inv. No. 731-TA-811 (Preliminary), USITC Pub. 3149 at 5-7 (Dec. 1998) ("Prelim. Det."). Although we are not bound by prior like product determinations, we note that this was consistent with prior Commission determinations concerning DRAMs. *See* DRAMs of One Megabit and Above from the Republic of Korea, Inv. No. 731-TA-556 (Preliminary), USITC Pub. 2529 (June 1992), (Final) USITC Pub. 2629 (May 1993), (Remand) USITC Pub. 2997 (Oct. 1996); DRAMs of 256 Kilobits and Above from Japan, Inv. No. 731-TA-300 (Preliminary), USITC Pub. 1803 (Jan. 1986); 64K DRAMs from Japan, Inv. No. 731-TA-270 (Preliminary), USITC Pub. 1735 (Aug. 1985), and (Final) USITC Pub. 1862 (July 1986).

<sup>19</sup> The petitioner in this investigation is Micron Technology, Inc. ("Micron").

<sup>20</sup> Respondents who submitted briefs and hearing testimony in the final phase of this investigation are the Taiwan Semiconductor Industry Association ("TSIA") and Taiwan producers Vanguard International Semiconductor Corp. ("Vanguard") and Mosel-Vitec (collectively "respondents" or "TSIA"). Additional foreign producers and importers, as well as one domestic design house, entered notices of appearance but did not submit briefs or participate in the hearing in this phase of the investigation.

<sup>21</sup> Petitioner's Prehearing Brief at 5-8; TSIA Prehearing Brief at 2.

<sup>22</sup> 19 U.S.C. § 1677(4)(A).

<sup>23</sup> *See* United States Steel Group v. United States, 873 F. Supp. 673, 681-84 (Ct. Int'l Trade 1994), *aff'd*, 96 F. 3d 1352 (Fed. Cir. 1996).

<sup>24</sup> Prelim. Det. at 7-10. Consistent with the scope, however, the Commission did not include U.S.-assembled DRAMs containing dice fabricated in Taiwan in its definition of domestic production, because Commerce considers such DRAMs to be subject merchandise.

houses are part of the domestic industry.<sup>25</sup> Respondents argue that the domestic industry should be defined to include DRAM fabricators, assemblers of DRAMs, module assemblers, and fabless design houses.<sup>26</sup>

In light of additional evidence obtained during the final phase and because the parties have raised new arguments in support of their positions, we have reconsidered whether, in addition to fabrication of uncased DRAMs, any of the following processes, if performed in the United States, also constitutes domestic production of DRAMs: (1) assembly (casing) of either imported or domestically fabricated uncased DRAMs into cased DRAMs (DRAM “assembly” or “assembly/test” operations); (2) assembly of DRAMs onto memory modules (“module assembly”); and (3) the design of DRAMs that are actually fabricated outside the United States (*i.e.*, the activities of “fabless design houses”). In each instance, the question before us is whether the operation in question involves sufficient U.S. production-related activity to constitute domestic production of the like product.<sup>27</sup> For the reasons discussed below, we reaffirm our preliminary determination that the domestic industry producing DRAMs consists of those producers that fabricate and/or assemble DRAMs in the United States, but does not include module assemblers or fabless design houses

### **1. Whether Assembly of Uncased DRAMs Into Cased DRAMs Constitutes Domestic Production**

The Commission’s preliminary definition of domestic production included assembly of both domestically fabricated uncased DRAMs and uncased DRAMs imported from nonsubject countries.<sup>28</sup> In the final phase, respondents support the Commission’s preliminary determination to treat DRAM assembly as domestic production.<sup>29</sup> Petitioner continues to argue, as it did in the preliminary phase, that the domestic industry consists of companies that fabricate DRAMs in the United States, including their assembly operations, but should not include the assembly of imported nonsubject DRAMs or the activities of independent or contract assemblers, regardless of the origin of the dice assembled.<sup>30</sup> For the reasons

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<sup>25</sup> Petitioner’s Prehearing Brief at 8-11; Petitioner’s Posthearing Brief at Exhibit 16.

<sup>26</sup> TSIA Prehearing Brief at Exhibit 1.

<sup>27</sup> In assessing the nature and extent of production-related activities in the United States associated with a particular operation, the Commission generally considers six factors: (1) source and extent of the firm’s capital investment; (2) technical expertise involved in U.S. production activities; (3) value added to the product in the United States; (4) employment levels; (5) quantity and type of parts sourced in the United States; and (6) any other costs and activities in the United States directly leading to production of the like product. *See, e.g., Certain Seamless Carbon and Alloy Steel Standard, Line, and Pressure Pipe from the Czech Republic, Japan, Mexico, Romania, and South Africa*, Inv. Nos. 731-TA-846-850 (Preliminary), USITC Pub. 3221 at 12 n.49 (Aug. 1999).

<sup>28</sup> Prelim. Det. at 8-9. During the period of investigation, 7 of the 12 domestic companies that fabricated uncased DRAMs in the United States also assembled uncased DRAMs in the United States. In addition, two companies without U.S. fabrication facilities assembled imported nonsubject DRAMs in the United States. Domestic producer \*\*\* performs assembly on \*\*\*. Table III-1, CR at III-3, PR at III-2.

<sup>29</sup> TSIA Prehearing Brief, Exhibit 1 at 1-3.

<sup>30</sup> In a somewhat inconsistent position, petitioner also contends that the “like product” consists only of DRAMs fabricated in the United States, and therefore only assembly of such DRAMs (which would technically include assembly of domestically fabricated DRAMs by non-integrated assemblers) should be considered domestic  
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discussed below, we find that DRAM assembly operations constitute domestic production, regardless of whether the producer is integrated and regardless of the origin (domestic or imported nonsubject) of the uncased DRAMs assembled in the United States.

*Source and extent of capital investment.* The capital investment associated with building a new chip assembly/test facility is currently somewhere in the range of \$20-\$50 million.<sup>31</sup> By contrast, constructing and equipping a new fabrication facility (“fab”) costs more than \$1 billion.<sup>32</sup> Four domestic producers reported capital expenditures separately for the various stages of production. While fabrication accounted for between \*\*\* and \*\*\* percent of total capital expenditures by these producers during the period of investigation, capital expenditures for assembly/test operations were the second largest, ranging from \*\*\* to \*\*\* percent of the total. The shares of reported capital expenditures devoted to the design and module assembly stages were much smaller.<sup>33</sup>

*Technical expertise involved in U.S. production activities.* While somewhat more labor intensive than fabrication, DRAM assembly is nevertheless a highly automated and technologically sophisticated process.<sup>34</sup> Several domestic producers engaged in assembly of uncased DRAMs indicated that assembly requires a “medium” level of technical expertise.<sup>35</sup>

*Value added to the product in the United States.* Three producers provided value added data broken out for the design, fabrication, and assembly/test production stages. For 64 Mb DRAMs, the domestic value added through fabrication ranged from \*\*\* to \*\*\* percent, while value added by the assembly/test stage ranged from \*\*\* to \*\*\* percent.<sup>36</sup>

*Employment levels.* Assembly of uncased DRAMs is more labor intensive than fabrication.<sup>37</sup> For the interim period (Jan.-June 1999), U.S. assemblers reported employing 4,449 production related workers (PRWs), while domestic fabricators reported average employment of 9,112 PRWs.<sup>38</sup>

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<sup>30</sup> (...continued)  
production. Petitioner’s Prehearing Brief at 8-10; Petitioner’s Posthearing Brief at Exhibit 16.

<sup>31</sup> TSIA Prehearing Brief, Exhibit 1-A; Transcript of Commission Hearing (“Hearing Tr.”) at 78-80 (Oct. 19, 1999).

<sup>32</sup> Hearing Tr. at 20, 78-80.

<sup>33</sup> CR at VI-10, PR at VI-5; Table L-1, CR at L-4-L-5, PR at L-3.

<sup>34</sup> CR at I-9, PR at I-7; TSIA Prehearing Brief, Exhibit 1 at 2, 10-16 (discussing the technological issues facing assemblers in the near future).

<sup>35</sup> See Preliminary Producer Questionnaire Responses of \*\*\* at Question II-13.a and \*\*\* at Question II-12.

<sup>36</sup> Table VI-4, CR at VI-9, PR at VI-4. We note, however, that the reporting producers include \*\*\*, which \*\*\*. If that company’s data are excluded, the lower end of the range is \*\*\* percent.

<sup>37</sup> CR at I-9, PR at I-7.

<sup>38</sup> Table III-7, CR at III-18, PR at III-11. This reflects the fact that more fabrication than assembly takes place in the United States.

*Quantity and type of parts sourced in the United States.* The percentage of domestically cased DRAMs incorporating U.S. fabricated dice was \*\*\* percent in 1996, \*\*\* percent in 1997, \*\*\* percent in 1998, and \*\*\* percent in interim 1999.<sup>39</sup>

Overall, we find that DRAM assembly is not as sophisticated a process as fabrication, but does involve a moderate degree of technological sophistication, warranting continuing R & D and capital spending to keep up with the latest product and process developments. The amount of capital spending associated with domestic DRAM assembly operations is considerably less than that spent on fabrication operations, but is nevertheless not insubstantial. Similarly, while fabrication involves greater value added than assembly, the total value added by the assembly process is more than minimal in absolute terms. Assembly operations also employ a significant number of domestic PRWs and source domestically the large majority of uncased DRAMs used. For all these reasons, we include operations that assemble domestically fabricated and imported nonsubject DRAMs in the domestic industry.<sup>40</sup>

## **2. Whether Assembly of Cased DRAMs Into Memory Modules Constitutes Domestic Production**

Module assembly involves attaching cased DRAMs and other components to a printed circuit board.<sup>41</sup> In the first stage of the process, the printed circuit board is put through a screen printer and then a glue machine which places an adhesive on the board. An automated pick and place machine selects the appropriate DRAM components, plus associated logic components and capacitors, and places them in the correct positions on the board. Modules are then placed in a reflow oven, which causes the solder of the leads on the DRAMs and other components to adhere to the printed circuit board. Finally, the modules are

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<sup>39</sup> Table III-4 n.1, CR at III-17, PR at III-9.

<sup>40</sup> We reject petitioner's argument that domestic production should be defined to include assembly operations of integrated domestic producers when performed on domestically fabricated dice, but should not include assembly of domestic dice by independent domestic assemblers or assembly of third country dice by domestic assemblers. Petitioner's Posthearing Brief, Exhibit 16. While the percentage of domestic inputs used in a product or production process is one of the factors typically considered by the Commission in determining whether an activity constitutes domestic production, it is not generally treated as dispositive. *See, e.g., Certain All Terrain Vehicles from Japan*, Inv. No. 731-TA-388 (Final), USITC Pub. 2163 at 13-14 (Mar. 1989) (finding that a "modest percentage of domestically-sourced parts or raw materials as a percentage of cost does not necessarily mean that a firm is not a domestic producer"). Moreover, the Commission generally considers this factor (and the other factors) on an industry-wide basis, rather than on a company-by-company basis, as petitioner appears to propose. Finally, even if one could arguably find that one company's assembly operation constitutes domestic production while another's does not, based on the origin of the dice, this would not provide a basis for making the second distinction that petitioner advocates: that is, a distinction between assembly of domestic dice by integrated domestic producers versus assembly of domestic dice by independent or contract domestic assemblers. Petitioner offers no legal or factual justification for this latter distinction, and we do not adopt it.

<sup>41</sup> Of the twelve domestic fabricators, five also assembled DRAM modules in the United States (either in their own facilities or using a contractor) during the period of investigation, as did one domestic DRAM assembler without a U.S. fabrication facility. Table III-1, CR at III-3, PR at III-2. There are reported to be a total of over 50 domestic module manufacturers, including companies performing contract module assembly as well as companies that design, build and sell their own modules. TSIA Prehearing Brief, Exhibit 1-B.

put through a wash cycle that removes any excess residue of flux or paste, and are tested in module testing machines.<sup>42</sup>

In the preliminary determination, the Commission concluded that DRAM module assembly does not constitute domestic production.<sup>43</sup> In the final phase, petitioner supports the Commission's preliminary determination, while respondents continue to argue that module assembly should be considered domestic production.<sup>44</sup> For the reasons discussed below, we reaffirm our preliminary determination that module assembly involves insufficient domestic production-related activity to be considered domestic production.

*Source and extent of capital investment.* Although we lack precise information on the capital investment needed to establish or sustain a module assembly facility, the parties agree that module assembly involves a lesser capital investment than DRAM assembly.<sup>45</sup> Integrated domestic producers reported that module assembly accounted for between \*\*\* and \*\*\* percent of their total annual capital expenses during the period of investigation.<sup>46</sup>

*Technical expertise involved in U.S. production activities.* The parties are in general agreement that the degree of technical expertise involved in module production is less than that involved in either fabrication or assembly of DRAMs.<sup>47</sup>

*Value added to the product in the United States.* One module assembler reported that its value added for all DRAMs is \*\*\* percent.<sup>48</sup> This is consistent with the fact that the DRAM chips on a module account for about 90-95 percent of the module's value, from which it can be inferred that module assembly involves limited value added.<sup>49</sup>

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<sup>42</sup> CR at I-11, PR at I-8-I-9.

<sup>43</sup> Prelim. Det. at 9.

<sup>44</sup> Petitioner's Prehearing Brief at 8, 10; TSIA Prehearing Brief, Exhibit 1 at 4-7.

<sup>45</sup> See TSIA Prehearing Brief at Exhibit 1 (mistakenly citing information about chip assembly costs rather than module assembly); Hearing Tr. at 78-80; Petitioner's Posthearing Brief at Exhibit 9 (unsubstantiated estimate that a module assembly facility could be constructed for about \$1 million). We note that \*\*\*, the largest independent domestic module manufacturer, reported capital expenditures of between \*\*\* and \*\*\* each year from 1996 through 1998, for total capital expenditures over the entire period of investigation of \*\*\*. During the same period, it reported a book value of fixed assets ranging from \*\*\* to \*\*\* and an original cost of fixed assets ranging from \*\*\* to \*\*\*. Table J-3, CR at J-5, PR at J-3. Because \*\*\* is the largest independent module assembler in an industry of mostly much smaller producers, we do not believe that its data are necessarily representative of all independent module assemblers.

<sup>46</sup> Table L-1, CR at L-4-L-5, PR at L-3.

<sup>47</sup> TSIA Prehearing Brief at Exhibit 1; Hearing Tr. at 78-80; Petitioner's Posthearing Brief at Exhibit 9.

<sup>48</sup> CR at VI-8, PR at VI-3.

<sup>49</sup> Transcript of Commission Conference (Nov. 13, 1998) at 37, 80 ("Conf. Tr."); CR at I-7-I-8 n.18, PR at I-6 n.18.

*Employment levels.* Responding domestic DRAM fabricators and assemblers reported employing \*\*\* PRWs in the production of DRAM modules in interim 1999.<sup>50</sup> These numbers are likely to significantly understate employment in module assembly, however, since they account only for integrated producers.

*Quantity and type of parts sourced in the United States.* The percentage of domestically produced modules made with domestically fabricated dice or third source dice assembled in the United States was \*\*\* percent in 1996, \*\*\* percent in 1997, \*\*\* percent in 1998, and \*\*\* percent in interim 1999.<sup>51</sup>

Overall, aside from the fact that most DRAMs assembled into modules in the United States were also fabricated here, the record evidence supports our preliminary determination that module assembly does not constitute domestic production of DRAMs. Because module assembly appears to add little value to cased DRAMs, and given the relatively unsophisticated nature of the production process and the much smaller amount of capital investment involved relative to either DRAM fabrication or assembly, we again find that module assembly does not constitute domestic production.

### **3. Whether Fabless Design Houses Are Part of the Domestic Industry**

“Fabless” design companies focus on the design stage of DRAM production. Using skilled technical employees, computer hardware, and computer-aided design software, they create the design of the circuit layout for a DRAM chip, which is then placed on a mask set (by the design house or by a subcontractor). Unlike DRAM fabricators, which both design and fabricate DRAMs, fabless design houses own no fabrication facilities. Instead, they contract out the production of DRAMs bearing their designs to “foundry” producers, many of which are located in Taiwan.<sup>52</sup>

Both in the preliminary phase of this investigation and in the recent SRAMs investigation, the Commission determined that fabless design houses located in the United States are not part of the domestic industry because they do not actually engage in production of a domestic like product.<sup>53</sup> The Commission reasoned that SRAM (and DRAM) designs, although necessary to SRAM (or DRAM) production, did not come within the definition of the like product, reflecting, in turn, the fact that Commerce did not define the subject merchandise to include SRAM (or DRAM) designs or mask sets. To the contrary, the Commission found that the designs are incorporated into SRAMs (or DRAMs) that Commerce had included in the definition of the subject merchandise.

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<sup>50</sup> Table III-7, CR at III-18, PR at III-11. The \*\*\* responding non-integrated module manufacturers that provided usable questionnaire responses reported additional employment of \*\*\* PRWs, respectively, for interim 1999. See Producer Questionnaire Responses of \*\*\*.

<sup>51</sup> Table III-4 n.2, CR at III-17, PR at III-9.

<sup>52</sup> Foundry producers are companies that have capacity to produce DRAMs and/or other semiconductor products which they use to produce to other companies’ designs under contract. The design house also contracts out the assembly stage either to the foundry or to another assembler, then generally markets the finished DRAMs under its own brand name. CR at I-8 n.23, PR at I-7 n.23; Alliance Postconference Brief at 2-3.

<sup>53</sup> Prelim. Det. at 9-10; Static Random Access Memory Semiconductors from Korea and Taiwan, Inv. Nos. 731-TA-761-762 (Final), USITC Pub. 3098 at 9-10 (Apr. 1998) (“SRAMs”).

In this final phase, respondents do not repeat the legal arguments made in the preliminary phase, in which they criticized the legal reasoning underlying the Commission's SRAMs decision. Instead, their arguments are now focused solely on demonstrating that the facts of record support defining design as domestic production under the six factor test.<sup>54</sup> For the reasons stated in the Commission's preliminary determination and in SRAMs, we find that the activities of fabless design houses do not constitute domestic production as a matter of law. So long as fabless design house resources are being used in the production of a product that Commerce has defined as subject merchandise, rather than a U.S. product, the extent of their capital investment, value added, and employment in the United States is irrelevant to the definition of the domestic industry. Accordingly, we do not need to reach respondents' factual arguments on the extent of fabless design houses' production-related activities in the United States and we continue to exclude fabless design houses from our definition of the domestic industry.

#### **E. Related Parties**

We must further determine whether any producer of the domestic like product should be excluded from the domestic industry pursuant to 19 U.S.C. § 1677(4)(B). That provision of the statute allows the Commission, if appropriate circumstances exist, to exclude from the domestic industry producers that are related to an exporter or importer of subject merchandise, or which are themselves importers.<sup>55</sup> Exclusion of such a producer is within the Commission's discretion based upon the facts presented in each case.<sup>56</sup>

In the preliminary determination, the Commission found that U.S. producer Mitsubishi Electronics America ("Mitsubishi") is an importer of subject merchandise and that appropriate circumstances existed to exclude it from the domestic industry.<sup>57</sup> None of the parties challenged that decision, and the information collected in the final phase of the investigation reinforces our decision on this point in the preliminary determination.<sup>58</sup> In light of Mitsubishi's progression from domestic producer to importer over the

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<sup>54</sup> TSIA Prehearing Brief, Exhibit 1 at 8-9. Petitioner supports the Commission's preliminary determination not to include fabless design houses in the domestic industry. Petitioner's Prehearing Brief at 10-11.

<sup>55</sup> 19 U.S.C. § 1677(4)(B).

<sup>56</sup> Sandvik AB v. United States, 721 F. Supp. 1322, 1331-32 (Ct. Int'l Trade 1989), *aff'd without opinion*, 904 F.2d 46 (Fed. Cir. 1990); Empire Plow Co. v. United States, 675 F. Supp. 1348, 1352 (Ct. Int'l Trade 1987). The primary factors the Commission has examined in deciding whether appropriate circumstances exist to exclude the related parties include: (1) the percentage of domestic production attributable to the importing producer; (2) the reason the U.S. producer has decided to import the product subject to investigation, *i.e.*, whether the firm benefits from the LTFV sales or subsidies or whether the firm must import in order to enable it to continue production and compete in the U.S. market, and (3) the position of the related producers vis-a-vis the rest of the industry, *i.e.*, whether inclusion or exclusion of the related party will skew the data for the rest of the industry. *See, e.g., Torrington Co. v. United States*, 790 F. Supp. 1161, 1168 (Ct. Int'l Trade 1992), *aff'd without opinion*, 991 F.2d 809 (Fed. Cir. 1993). The Commission has also considered the ratio of import shipments to U.S. production for related producers and whether the primary interests of the related producers lie in domestic production or in importation. *See, e.g., Melamine Institutional Dinnerware from China, Indonesia, and Taiwan*, Inv. Nos. 731-TA-741-743 (Final), USITC Pub. 3016 at 14, n.81 (Feb. 1997).

<sup>57</sup> Prelim. Det. at 10-12.

<sup>58</sup> *See* Table III-1, CR at III-3, PR at III-2; Table III-2, CR at III-13, PR at III-6; Table III-4, CR at III-16, (continued...)

investigation period, the improvement of Mitsubishi's financial performance after its U.S. fab was closed, and its \*\*\*, we find that Mitsubishi's interests lie principally in importing rather than in domestic production. Accordingly, for the reasons stated in the preliminary determination, we continue to find that appropriate circumstances exist to exclude Mitsubishi from the domestic industry.

In the preliminary phase, the Commission also identified several other domestic producers that are or may be related parties, either by virtue of having imported subject merchandise or through corporate or contractual relationships with Taiwan producers, and stated that it would reconsider which domestic producers might be related parties and whether appropriate circumstances might exist to exclude such producers in any final phase of the investigation.<sup>59</sup> In this final phase, none of the parties has addressed the issue of related parties.

We find that \*\*\* and \*\*\* are related parties because they imported subject merchandise from Taiwan during the investigation period.<sup>60</sup> We also find that Toshiba America Electronic Components, Inc. ("Toshiba") and TwinStar/Texas Instruments ("TwinStar/TI") are related parties because of corporate or contractual relationships with Taiwan producers involving direct or indirect control.<sup>61</sup> Toshiba's corporate grandparent, Toshiba Corp. of Japan ("Toshiba Japan"), transferred technology and training to Taiwan producer Winbond pursuant to an agreement that requires Winbond to supply Toshiba Japan with DRAMs on an OEM basis.<sup>62</sup> Based on the comprehensiveness of the arrangement between Toshiba Japan and Winbond and Toshiba Japan's corporate control of its subsidiary Toshiba, we find that Toshiba and Winbond are under common control and, therefore, that Toshiba is a related party. We also find that TwinStar/TI was a related party up until its June 1998 acquisition by Micron, because \*\*\*.<sup>63</sup>

Based on the available information, we do not find evidence of direct or indirect control in any of the other corporate or contractual relationships between domestic producers and producers or importers of the subject merchandise. For the reasons discussed below we do not find appropriate circumstances to exclude any domestic producers other than Mitsubishi from the domestic industry.

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<sup>58</sup> (...continued)

PR at III-9; and Table VI-3, CR at VI-7, PR at VI-3.

<sup>59</sup> Prelim. Det. at 12.

<sup>60</sup> Table III-2, CR at III-13, PR at III-6. There is insufficient information to determine whether \*\*\* were imported from Taiwan during or before the investigation period. This issue is largely moot, however, because none of \*\*\* financial data is available for inclusion in the industry-wide performance tables. Table VI-3, CR at VI-5-VI-7, PR at VI-3.

<sup>61</sup> Direct or indirect control exists when "the party is legally or operationally in a position to exercise restraint or direction over the other party." 19 U.S.C. § 1677(4)(B)(ii).

<sup>62</sup> Petitioner's Prehearing Brief at Exhibit 14. \*\*\*. TSIA Posthearing Brief at Q-6.

<sup>63</sup> Table III-2, CR at III-13, PR at III-6.

\*\*\*. Although \*\*\* imports rose between 1996 and 1997, they fell in 1998 and returned to zero by interim 1999.<sup>64</sup> Even though \*\*\*, it does not appear to have benefitted financially from its imports.<sup>65</sup> In addition, because of \*\*\*,<sup>66</sup> we find that \*\*\* primary interest lies in domestic production rather than in importing the subject merchandise. We therefore find that appropriate circumstances do not exist to exclude \*\*\* from the domestic industry.

\*\*\*. \*\*\*, imported subject merchandise from Taiwan during the period of investigation.<sup>67</sup> Nevertheless, \*\*\* U.S. DRAMs producer.<sup>68</sup> Moreover, \*\*\* imports were small relative to its domestic production, and, as a consequence, its \*\*\* financial condition cannot be attributed to its decision to import subject merchandise.<sup>69</sup> Accordingly, we find that appropriate circumstances do not exist to exclude \*\*\* from the domestic industry.

*Toshiba.* Notwithstanding Toshiba's corporate grandparent's relationships with various Taiwan producers, Toshiba's commitment to domestic production is evidenced by its large investment in and recent takeover of Dominion.<sup>70</sup> In any event, Toshiba \*\*\*, so including Toshiba in the domestic industry is not likely to affect industry-wide trends. We therefore find that appropriate circumstances do not exist to exclude Toshiba from the domestic industry.

*TwinStar/TI.* During the investigation period, \*\*\* as a percentage of domestic production as TwinStar/TI's domestic facility moved into commercial operation, indicating a continuing commitment to domestic production. TwinStar/TI did not benefit from \*\*\*; its financial performance was \*\*\*.<sup>71</sup> Accordingly, we find that appropriate circumstances do not exist to exclude TwinStar/TI from the domestic industry.

## II. NO MATERIAL INJURY BY REASON OF THE SUBJECT IMPORTS

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<sup>64</sup> Table III-2, CR at III-13, PR at III-6.

<sup>65</sup> \*\*\* financial performance was \*\*\*, when its imports declined. Table III-1, CR at III-3, PR at III-2; Table VI-3, CR at VI-7, PR at VI-3.

<sup>66</sup> Table III-4, CR at III-16, PR at III-9; CR at III-5, PR at III-3.

<sup>67</sup> Table III-2, CR at III-13, PR at III-6; CR at III-2 n.6, PR at III-2. \*\*\*.

<sup>68</sup> Table III-4, CR at III-16, PR at III-9.

<sup>69</sup> Table III-2, CR at III-13, PR at III-6; Table VI-3, CR at VI-7, PR at VI-3.

<sup>70</sup> CR at III-4-III-5, PR at III-5; *see also* Petitioner's Prehearing Brief at Exhibit 1 ("IBM Sells Its Dominion DRAM Stake to Toshiba," Electronics Times (Jul. 12, 1999); "IBM to Exit Chip Venture with Toshiba," located on Oct. 13, 1999, at <http://www.techweb.com/wire/story/TWB19990707S000>).

<sup>71</sup> Table III-2, CR at III-13, PR at III-6; Table IV-1, CR at IV-3, PR at IV-1; Table VI-3, CR at VI-7, PR at VI-3.

In the final phase of antidumping or countervailing duty investigations, the Commission determines whether an industry in the United States is materially injured by reason of the imports under investigation.<sup>72</sup> In making this determination, the Commission must consider the volume of imports, their effect on prices for the domestic like product, and their impact on domestic producers of the domestic like product, but only in the context of U.S. production operations.<sup>73</sup> The statute defines “material injury” as “harm which is not inconsequential, immaterial or unimportant.”<sup>74</sup> In assessing whether there is a reasonable indication that the domestic industry is materially injured by reason of subject imports, we consider all relevant economic factors that bear on the state of the industry in the United States.<sup>75</sup> No single factor is dispositive, and all relevant factors are considered “within the context of the business cycle and conditions of competition that are distinctive to the affected industry.”<sup>76</sup>

For the reasons discussed below, we determine that the industry producing DRAMs is not materially injured by reason of the subject imports.

#### **A. Conditions of Competition**

A number of conditions of competition are pertinent to our analysis in this investigation. First, the DRAM market is characterized by rapid technological advancements in terms of density (the amount of memory contained in a chip), die shrinks (the number of chips that can be produced on a wafer of a certain size), and addressing technology (which affects interface speed -- the speed with which a DRAM can be accessed by other elements of a computer).<sup>77</sup> Each time a producer moves to a new density, die shrink, or addressing technology, it starts a new “learning curve” or product life cycle. At the beginning of the product life cycle, production costs initially rise and yields (the percentage of usable dice obtained from a single wafer) decline. As each product moves through its life cycle, experience is gained and production volume increases, resulting in declining costs and rising yields. Price trends are generally correlated with the product life cycle. They start high for a new, state-of-the-art product, decline rapidly as the product becomes a commodity, and continue to decline until the product is replaced by the next generation of technology.<sup>78</sup>

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<sup>72</sup> 19 U.S.C. §§ 1671d(b) and 1673d(b).

<sup>73</sup> 19 U.S.C. § 1677(7)(B)(i). The Commission “may consider such other economic factors as are relevant to the determination” but shall “identify each {such} factor . . . and explain in full its relevance to the determination.” 19 U.S.C. § 1677(7)(B). *See also* Angus Chemical Co. v. United States, 140 F.3d 1478 (Fed. Cir. 1998).

<sup>74</sup> 19 U.S.C. § 1677(7)(A).

<sup>75</sup> 19 U.S.C. § 1677(7)(C)(iii).

<sup>76</sup> 19 U.S.C. § 1677(7)(C)(iii).

<sup>77</sup> CR at I-6-I-7, I-10-I-11, PR at I-5-I-6, I-7-I-8.

<sup>78</sup> CR at I-10, I-17, II-1-II-3, PR at I-8, I-12, II-1-II-3; Hearing Tr. at 46; Petitioner’s Prehearing Brief at 31; TSIA Prehearing Brief at 11; TSIA Posthearing Brief at 7-8. Thus, per bit DRAM prices always decline over the long term. As discussed below, however, there is typically a seasonal spike in DRAM demand in the fall, which can halt or even reverse this declining price trend in the short term, depending on supply conditions.

At present, the pace of advances in chip density and die shrinks appears to be accelerating, at least for many computer applications, which account for the majority of consumption. This results in shorter life cycles both for a particular density generation or die shrink and, to some extent, the equipment used to produce DRAMs.<sup>79</sup> By contrast, some other applications, such as telecommunications equipment and consumer electronics, have not followed the computer industry in switching to each new density. Thus, there is a continuing market in these applications for lower density (“legacy”) chips.<sup>80</sup>

To keep developing new technology, DRAM producers must invest constantly in new capital equipment as well as R & D. Historically, that capital equipment has a productive life cycle of about three years, although, as noted above, it may be getting shorter.<sup>81</sup> The cost of constructing a new fab presently exceeds \$1 billion, of which half to \*\*\* represents equipment costs. Equipment costs continue to rise as the production technology needed to produce smaller circuitry becomes more sophisticated.<sup>82</sup>

The industry’s need to innovate is driven, in part, by continually rising demand for more and faster memory. During the period of investigation, apparent consumption, in terms of bits, increased by approximately 370 percent between 1996 and 1998, and by an additional \*\*\* percent between interim 1998 and interim 1999.<sup>83</sup>

To meet rising demand, both in the United States and worldwide, world capacity to produce DRAMs has increased significantly over the period of investigation.<sup>84</sup> Production capacity can be increased in several ways: increasing wafer starts (*i.e.*, by constructing a new fab), moving to a higher density chip, or shrinking die sizes.<sup>85</sup> As discussed further below, domestic and worldwide capacity has increased in all three ways during the period of investigation. The scale on which DRAM production must take place assures that the opening of a new fab or the introduction of a new die shrink results in a large

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<sup>79</sup> CR at II-3, PR at II-2; Hearing Tr. at 173-74; Credit Suisse/First Boston, Taiwan DRAM Industry: A Global Perspective (July 16, 1999) at 9 (“Credit Suisse Report”).

<sup>80</sup> CR at II-3, PR at II-2; Tables E-18 and E-19, CR at E-38-E-39, PR at E-5; Hearing Tr. at 60-61, 115.

<sup>81</sup> Conf. Tr. at 16-17; Petitioner’s Prehearing Brief at 12-14; Hearing Tr. at 20-21, 23-24.

<sup>82</sup> Hearing Tr. at 20-21, 78; Petitioner’s Posthearing Brief at Exhibit 15; Staff Field Trip Notes (Aug. 10, 1999) at 1-2.

<sup>83</sup> Table IV-3, CR at IV-7, PR at IV-5.

<sup>84</sup> Petitioner’s Prehearing Brief at 39-40; Petitioner’s Posthearing Brief at Exhibit 5.

<sup>85</sup> A new fab generally incorporates the latest technology and thus may contribute to capacity increases through fabrication of the newest density generations and utilization of equipment capable of producing the smallest device geometries as well as added wafer starts. Petitioner’s Prehearing Brief at 14-16; Petitioner’s Posthearing Brief at Exhibit 4; TSIA Posthearing Brief at 9. Capacity can also be increased by increasing the size of the wafer used in the production process. During the period of investigation, most remaining 6-inch wafer lines were abandoned or converted to 8-inch wafers, which are now standard. Although an industry-wide switch to 12-inch (300 mm) wafers is anticipated at some point in the future, it did not occur during the period of investigation. CR at VII-5, PR at VII-3; Petitioner’s Prehearing Brief at 38; Hearing Tr. at 64-65; Petitioner’s Posthearing Brief at Exhibit 5; TSIA Posthearing Brief, Exhibit 8 at 2, 5; Credit Suisse Report at 20.

immediate increase in production capacity. Because growth in demand for DRAMs has been linear, however, supply and demand in the DRAM market tend to be chronically out of equilibrium.<sup>86</sup>

Because of the stark product life cycles and the chronic disequilibrium between supply and demand, the DRAM market has, since its inception in the 1970s, been characterized by repeated boom and bust cycles. In the course of the normal business cycle, the industry will typically experience several years of short supply and high profitability, followed by about a year of oversupply and poor profitability.<sup>87</sup> During most of the period of investigation, worldwide DRAM supply exceeded demand, resulting in significant worldwide price declines and declining profitability for the domestic industry.<sup>88</sup> Thus, that portion of the period of investigation was somewhat atypical, in that the bust cycle was more prolonged (approximately three years) than industry participants and analysts had reason to expect based on past experience.<sup>89</sup> Beginning at some point in 1999, however, the balance shifted markedly, with rising demand overtaking the growth in supply. Since as early as July 1999, domestic producers began placing their regular customers on allocation, while reducing spot market participation.<sup>90</sup>

Also relevant to our analysis is the existence of some degree of segmentation in the domestic DRAM market. Throughout this investigation, respondents have argued that the domestic DRAM market is served by both “Tier 1” or “brand name” producers and so-called “Tier 2” or “own brand” producers, and that there is little direct competition between the two tiers. The brand name producers are U.S., Japanese, Korean, and European producers with recognized brand names and leading edge technology. These producers tend to have production facilities in several countries and may contract for production with Taiwan producers, but generally sell under a single brand name regardless of the country where the DRAM was produced.<sup>91</sup> The own brand producers are Taiwan producers that produce DRAMs based on their own technology (or sometimes using a brand name partner’s technology) and market them under their own brand names.<sup>92</sup> We find that overall competition in the U.S. market between the subject merchandise and the domestic like product during the period of investigation has been somewhat attenuated in several

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<sup>86</sup> Conf. Tr. at 62; Hearing Tr. at 121-22, 152; Petitioner’s Posthearing Brief, Exhibit 4 at 6-7; Credit Suisse Report at 7.

<sup>87</sup> Associated Press, “Micron Finances in Good Shape Despite Freefall of Chip Prices” (Jan. 15, 1999); Hearing Tr. at 6, 22, 67-68, 76, 121-22. As noted above, per bit DRAM prices always decline over the long term. Although prices might increase in a market upturn, the boom cycle in this industry is not necessarily defined by rising prices and can occur even as prices continue to decline in a manner consistent with the product life cycle.

<sup>88</sup> Hearing Tr. at 71-72, 121-22; TSIA Prehearing Brief at Exhibit 3; Petitioner’s Posthearing Brief at Exhibit 3 and Exhibit 4 at 10.

<sup>89</sup> Hearing Tr. at 6, 22, 121-22; Credit Suisse Report at 4, 8.

<sup>90</sup> Hearing Tr. at 87-88, 90, 96, 102; Petitioner’s Posthearing Brief, Exhibit 13 (“Sold Out: DRAM Vendors Place OEMs on Allocation,” Electronic Buyers’ News (Oct. 8, 1999)).

<sup>91</sup> CR at I-13, I-15-I-16, VII-2, PR at I-10, I-11-I-12, VII-1-VII-2; TSIA Prehearing Brief at 6, 8-9, and Exhibit 4; Hearing Tr. at 153-54; TSIA Posthearing Brief at Q4-Q9.

<sup>92</sup> CR at I-13, PR at I-10; TSIA Prehearing Brief at 10; Hearing Tr. at 160, 165-66; TSIA Posthearing Brief at Q4-Q-9. The own brand Taiwan producers are Nan Ya, Vanguard, and Mosel-Vitellic. There is some record information to suggest that Nan Ya and Vanguard may \*\*\*. Compare Foreign Producer Questionnaire Response of \*\*\* at 8 with those of \*\*\*.

respects, although not to the extent argued by respondents. First, during the period of investigation, own brand Taiwan producers generally lagged behind leading domestic and third country producers by a year or more in the adoption of new densities and process technologies.<sup>93</sup> Second, DRAMs from own brand Taiwan producers sell overwhelmingly in the U.S. spot market and in the form of cased DRAMs, while a large majority of domestically produced DRAMs sell under contract and in the form of modules.<sup>94</sup>

On the purchaser side, the market can be divided into name brand PC OEMs (such as Compaq, Dell, IBM, Hewlett-Packard, and Gateway), other OEMs (PC “clone” manufacturers, as well as producers of telecommunications equipment and consumer electronics), module makers, and distributor/resellers.<sup>95</sup> The record indicates that name brand PC OEMs have stricter supplier qualification requirements than other categories of DRAM purchasers.<sup>96</sup> During the period of investigation, own brand Taiwan producers have generally not been qualified to supply name brand PC OEMs, which account for about 60 percent of domestic DRAM consumption.<sup>97</sup> While petitioners point to evidence that at least one name brand PC OEM, \*\*\*, lists \*\*\* own brand Taiwan producers on its list of qualified suppliers, one of those producers denies that it is qualified at that purchaser.<sup>98</sup>

Another condition of competition is the significant presence of nonsubject imports, principally from Korea and Japan, in the U.S. market. During the period of investigation, the U.S. market share held by

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<sup>93</sup> CR at I-14, II-15-II-18, PR at I-10, II-10-II-13. We recognize that this “technology gap” between name brand and own brand producers may be in the process of closing as own brand Taiwan producers acquire U.S. and third country technology partners. This is a fairly recent phenomenon, however, and is only beginning to become meaningful in the market. CR at II-18, VII-2-VII-3, PR at II-12-II-13, VII-1-VII-2; Credit Suisse Report at 26-27 (Vanguard) and 28 (Nan Ya).

<sup>94</sup> CR at I-16-I-17, II-5-II-6, PR at I-12, II-3-II-4; Petitioner’s Posthearing Brief at Exhibit 1.

<sup>95</sup> CR at I-15, II-1, II-3, PR at I-11.

<sup>96</sup> CR at II-12-II-13, PR at II-8-II-9; Hearing Tr. at 121, 127-28; TSIA Posthearing Brief, Exhibit 13 at 18-23.

<sup>97</sup> CR at II-1, II-5, II-18, PR at II-1, II-3-II-4, II-12; Conf. Tr. at 23; Hearing Tr. at 144-45, 212; TSIA Posthearing Brief, Exhibit 13 at 2; Purchaser Questionnaire Responses of \*\*\* at 17.

<sup>98</sup> Petitioner’s Prehearing Brief at 35; Petitioner’s Posthearing Brief at 7; Hearing Tr. at 127-28, 142-46; CR at II-18, PR at II-12-II-13. In a follow-up telephone call after our hearing, \*\*\* clarified that \*\*\*. CR at II-5 n.13, PR at II-3 n.13. Since \*\*\* is not yet marketing a 64 Mb DRAM in the United States because it has not yet completed its internal qualification on that product, any product it was qualified to supply to \*\*\* would have to be a legacy product rather than the industry standard 64 Mb SDRAM. Hearing Tr. at 143. Similarly, \*\*\*. Importer and Foreign Producer Questionnaire Responses of \*\*\*. Some of the confusion on whether particular Taiwan producers are in fact currently qualified to supply name brand PC OEMs may stem from the fact that the term “qualified supplier” seems to have more than one meaning in this industry. The PC OEM qualification process can involve multiple steps, including an overall corporate qualification, qualification of each specific fab, and qualification of specific products for specific applications. TSIA Prehearing Brief at Exhibit 2; Hearing Tr. at 127-28. While some market participants might refer to a supplier as “qualified” when it has passed the first or second step of the process, it still might not be qualified to supply any specific product to that customer and therefore would not be making any sales to the customer pending further qualification steps.

nonsubject imports in terms of volume ranged from approximately \*\*\* to \*\*\* percent.<sup>99</sup> A number of nonsubject producers have production facilities in several countries, including joint ventures or technology partnerships with Taiwan producers. These companies may have the option of sourcing DRAMs for any particular customer or market from manufacturing facilities in several countries.<sup>100</sup>

Finally, we note that, because conditions in the DRAM market in terms of technology, capacity, pricing, and other factors change so rapidly, we have placed particular reliance in this investigation on the most recent information available to us concerning the volume, price effects and impact on the domestic industry of the subject imports. Such information includes both questionnaire data for the first six months of 1999 and secondary source materials covering most of 1999 (up until the closing of the record in this investigation on November 15, 1999).<sup>101 102</sup>

## **B. Volume of the Subject Imports**

Section 771(7)(C)(i) of the Act provides that the “Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States, is significant.”<sup>103</sup>

As in the preliminary determination, we have focused on bits for purposes of assessing the volume and market share of imports, because total bits are a uniform measure of the quantity of DRAMs.<sup>104</sup> The use of bits as a unit of measurement presents difficulties for our analysis, however, as total bits are a function of chip density and product mix, both of which have changed substantially over the period of investigation.<sup>105</sup> Accordingly, we do not view the increase in subject imports in the DRAM market measured in terms of bits the same way we might view an increase of such magnitude in the volume of

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<sup>99</sup> Table IV-4, CR at IV-10, PR at IV-7.

<sup>100</sup> CR at II-10, II-13-II-14, PR at II-6, II-8-II-9; TSIA Prehearing Brief at 3-6; Hearing Tr. at 120, 122.

<sup>101</sup> We find that the court’s admonition in Saarstahl, AG v. United States, 858 F. Supp. 196, 200 (Ct. Int’l Trade 1994), that the Commission should use “information concerning the domestic industry in as contemporaneous a time frame as possible,” has particular relevance under the circumstances of this investigation.

<sup>102</sup> In the final phase, none of the parties challenges our preliminary determination that the captive production provision does not apply in this investigation. *See* 19 U.S.C. § 1677(7)(C)(iv). Because the record indicates that in 1998 the domestic industry captively consumed approximately 5 percent of its production of the domestic like product in the manufacture of downstream products, CR at III-22, PR at III-14, we again find that the threshold requirement of significant captive consumption is not satisfied and that the captive production provision does not apply in this investigation.

<sup>103</sup> 19 U.S.C. § 1677(7)(C)(i).

<sup>104</sup> Petitioner’s Posthearing Brief, Exhibit 1 at 3-4.

<sup>105</sup> In 1995, the first year for which we collected questionnaire data in the preliminary phase, the industry standard was moving from the 4 Mb DRAM to the 16 Mb DRAM. In 1998, the 64 Mb DRAM became the industry standard. Each of these changes quadrupled the number of bits of memory contained on a single chip. The presently ongoing switch to 128 Mb DRAMs will double the bit content of a single chip over that of a 64 Mb DRAM. CR at I-6, PR at I-5.

imports of another product.<sup>106</sup> For this reason, we have focused our analysis on subject import market shares.

Throughout the period of investigation, subject imports held a relatively small share of the domestic DRAM market and increased that share by less than \*\*\* percentage points. Subject imports' market share by quantity increased from 4.67 percent in 1996 to 5.58 percent in 1997 and 6.43 percent in 1998, and was \*\*\* percent in interim 1999, compared with 5.32 percent in interim 1998.<sup>107</sup> The domestic industry's market share in terms of bits remained relatively constant between 1996 and 1998, falling from 30.61 percent in 1996 to 30.23 percent in 1998. However, the domestic industry's market share rose by \*\*\* percentage points between the interim periods, from 28.95 percent in interim 1998 to \*\*\* percent in interim 1999.<sup>108</sup> Thus, while subject imports have gained market share, their gain has been primarily at the expense of nonsubject imports rather than the domestic like product.<sup>109</sup>

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<sup>106</sup> The quantity of subject imports, measured in bits, increased markedly during the period of investigation, rising from 356,921 billion in 1996 to 982,946 billion in 1997 and 2,464,169 billion in 1998. Subject imports were 1,904,392 billion bits in interim 1999, compared with 904,530 billion bits in interim 1998. Table IV-2, CR at IV-4, PR at IV-2. This rise in subject import volume is largely tempered, however, by the fact that apparent consumption, in terms of bits, also grew rapidly over the period of investigation, increasing by 24,478,017 billion bits, or approximately 370 percent, between 1996 and 1998 and by \*\*\* billion bits, or \*\*\* percent, between interim 1998 and interim 1999. Table IV-3, CR at IV-7, PR at IV-5.

In terms of value, subject imports followed a more gradual trend, rising from \$376.4 million in 1996 to \$440.1 million in 1997 and \$449.9 million in 1998. Subject imports by value were \$281.2 million in interim 1999, compared with \$216.8 million in interim 1998. Table IV-2, CR at IV-4, PR at IV-2. Analyzing the volume of subject imports in value terms is somewhat misleading, however, because of the large price declines that occurred over much of the period of investigation, which we discuss at length below in the context of price effects. Accordingly, we have also given these value data relatively little weight.

<sup>107</sup> Table IV-4, CR at IV-10, PR at IV-7. In value terms, the market share of subject imports rose from 4.25 percent in 1996 to 6.16 percent in 1997 and 7.10 percent in 1998, and was \*\*\* percent in interim 1999, compared with 6.48 percent in interim 1998. Subject imports have a higher market share in value terms than in terms of quantity because they are concentrated in lower density chips that cost more per bit.

<sup>108</sup> Table IV-4, CR at IV-10, PR at IV-7. In value terms, the domestic industry's market share declined slightly from 30.32 percent in 1996 to 27.85 percent in 1998, and was \*\*\* percent in interim 1999, compared with 26.34 percent in interim 1998. *Id.*

<sup>109</sup> Petitioner contends that our data understate the volume of subject imports because a number of smaller importers did not respond to questionnaires and urges us to draw an adverse inference against importers as a group and rely on official statistics as the facts available. Petitioner's Prehearing Brief at 24-28. We agree that our data may understate the volume of subject imports, but note that for the same reason the data also understate the volume of nonsubject imports. Because a significant number of importers, including most of the largest importers of the subject merchandise, did respond to the questionnaire, we do not believe it would be appropriate to draw an adverse inference against importers as a group. CR at IV-1, PR at IV-1. Moreover, because official statistics do not define DRAMs in a manner consistent with the scope of this investigation, we find that the questionnaire data are the best information available to us reflecting the volume of subject and nonsubject imports. CR at I-3, IV-1, PR at I-2-I-3, IV-1. Finally, although complete import data might increase the market shares of subject and nonsubject imports relative to that of the domestic industry in each period for which data were collected, we have no reason to believe that additional data would have changed the trends, which appear consistent with trends reported by other sources. *See, e.g.*, TSIA Posthearing Brief, Exhibit 7 at 2, 4, 8-10.

We find that even this modest market share overstates the effects of subject imports in the U.S. market, since U.S. shipments of subject DRAMs contained a much higher share of lower density legacy products than did shipments of the domestic like product throughout the period examined.<sup>110</sup> As discussed above, these differences in product mix reflect the fact that some, although not all, Taiwan producers have lagged behind the domestic industry technologically during much, if not all, of the period of investigation.<sup>111</sup> While the record indicates that DRAMs one density generation apart can technically be used interchangeably in a memory module, such interchangeability has practical limits, including space constraints within higher density modules and technological factors that can lead to sub-optimal performance.<sup>112</sup> Moreover, for other applications (such as some telecommunications equipment), purchasers are not willing to pay for a higher-priced higher-density chip for an application that can be satisfied by a lower density chip.<sup>113</sup> Thus, Taiwan producers are, in part, serving domestic demand for legacy products that the domestic industry is no longer making in significant volumes.<sup>114</sup>

Based on the relatively small absolute volume and market share of the subject imports, the less than \*\*\* percentage point gain in market share made by such imports over the period examined, the fact that any gains in subject import market share were largely not at the expense of the domestic industry (which increased its share over the period), the growth in apparent consumption during the period, the differences between the product mix of domestic and subject producers' U.S. sales, and our finding (discussed below) that subject imports have not caused significant adverse price effects, we find that neither the volume of subject imports nor the increase in that volume is significant, either in absolute terms or relative to production or consumption in the United States.

### **C. Price Effects of the Subject Imports**

Section 771(C)(ii) of the Act provides that, in evaluating the price effects of the subject imports, the Commission shall consider whether -- (I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States,

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<sup>110</sup> For example, in interim 1999, 16 Mb DRAMs accounted for \*\*\* percent of the value of U.S. commercial shipments of subject DRAMs, but only \*\*\* percent of the value of U.S. commercial shipments of domestic DRAMs. During the same period, 64 Mb DRAMs accounted for \*\*\* percent of the value of U.S. commercial shipments of Taiwan DRAMs and \*\*\* percent of the value of shipments of domestic DRAMs. However, the domestic industry shipped another \*\*\* percent by value in the form of modules, most of which were likely made up of 64 Mb DRAMs, which are currently the industry standard. Table E-18, CR at E-38, PR at E-5. *See also* TSIA Prehearing Brief at Exhibits 18 and 19.

<sup>111</sup> CR at I-14, II-15-II-18, PR at I-10, II-10-II-13.

<sup>112</sup> CR at I-12-I-13, PR at I-9; Hearing Tr. at 130; TSIA Posthearing Brief, Exhibit 13 at 4-6. Some substitutions, while technically possible, must be made at the design stage of the downstream product. CR at I-12, PR at I-9. Thus, we find that the record does not support petitioner's assertion (Hearing Tr. at 83-84, 97) that DRAM users are completely indifferent as to the density of the chips used so long as the total amount of memory is the same.

<sup>113</sup> CR at II-3, PR at II-2; TSIA Posthearing Brief, Exhibit 13 at 14-15.

<sup>114</sup> *See* TSIA Prehearing Brief at Exhibit 5 (Micron Obsolete Data Sheets). We note in particular that while petitioner continues to sell out of inventory certain legacy products that it no longer produces, it sells those products "as is" with no guarantee that they will work in purchasers' applications.

and (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.<sup>115</sup>

The parties agree that the product life cycle generally causes prices to decline by about 20 percent per year (or more) and that per bit DRAM prices, in general, decline constantly over the long term.<sup>116</sup> In fact, domestic producers' prices for all 7 DRAM products<sup>117</sup> for which we obtained usable monthly data fell precipitously from 1996 through early 1999, with a short interruption for some products in early 1997.<sup>118</sup> Public reports indicate, however, that DRAM prices in the U.S. market have been increasing significantly since July 1999 and that spot prices now exceed contract prices.<sup>119</sup>

While petitioner argues that the current supply shortage and associated allocations and price increases reflect only a seasonal peak in demand that occurs every year in the fourth quarter,<sup>120</sup> the record indicates that supply began tightening several months earlier in 1999 than it does in the normal seasonal peak. Moreover, while previous years' seasonal peaks have been associated with some product allocations and price stabilization, they have not generally resulted in sustained increases in DRAM prices over 4 or 5 months, as is occurring this year.<sup>121</sup> Nor do we accept petitioner's claim that the recent price increases are the result of one-time events like the recent Taiwan earthquake (Sept. 21, 1999) and Japanese nuclear accident (Sept. 30, 1999).<sup>122</sup> In particular, although the Taiwan earthquake caused a short period of panic buying, resulting in a price spike, the record indicates that the interruption to domestic and world supply caused by the earthquake was minimal and that the market quickly recovered. After declining from the price spike that occurred immediately after the earthquake, however, prices continued on their rising

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<sup>115</sup> 19 U.S.C. § 1677(7)(C)(ii).

<sup>116</sup> Hearing Tr. at 46; TSIA Posthearing Brief at 7-8.

<sup>117</sup> The products for which we collected pricing data include 4 Mb, 16 Mb, and 64 Mb DRAMs as well as an 8 Mb SGRAM, a specialty DRAM product. There was only one reported sale of Taiwan-fabricated product 8 (a 16 megabyte SIMM). CR at V-4, PR at V-3.

<sup>118</sup> See Tables V-8-V-14, CR at V-12-V-24, PR at V-9-V-10. Reported prices bottomed out and/or hit their lowest prices during the period for which data were collected in February 1999 (product 1), June/July 1998 (product 2), October 1998 (product 3), between January and June 1999 (products 4 and 5), June 1999 (product 6), and January 1999 (product 7).

<sup>119</sup> See, e.g., "Chip Industry Says It Will Post Strong Gains Through 2003," Wall Street Journal (Oct. 28, 1999) (noting price increases beginning in July 1999); Associated Press, "Micron Makes Chip Deal With Gateway," Yahoo! News (Oct. 28, 1999) (current 64 Mb DRAM price about \$12); "Sold Out: DRAM Vendors place OEMs on allocation," Electronic Buyers' News Online (Oct. 8, 1999) (contract OEM prices for 64 Mb DRAMs above \$10, up from \$4.50 in July); "Micron Technology says memory chip demand 'overwhelming,'" AFX News (Oct. 5, 1999) (petitioner Micron reports that its contract price for 64 Mb DRAMs rose to \$10 in early October 1999, from a low point of \$4 in the fourth quarter of 1998); TSIA Posthearing Brief, Exhibits 15 and 16; Petitioner's Posthearing Brief at 11.

<sup>120</sup> Hearing Tr. at 47, 87-88, 89, 96, 103; Petitioner's Posthearing Brief at Exhibit 13.

<sup>121</sup> Hearing Tr. at 132, 174-75; Petitioner's Posthearing Brief, Exhibit 13 (\*\*\*; news articles). See also note 119 *supra*.

<sup>122</sup> Petitioner's Posthearing Brief, Exhibit 13 at 3.

trend.<sup>123</sup> Thus, recent price increases, which are not consistent with either the product life cycle or the typical seasonal demand pattern, are generally understood to be the result of tightening supply.<sup>124</sup>

Indeed, the October 1999 announcements of three major DRAM multi-year supply agreements between petitioner Micron and PC OEMs Compaq and Gateway and between domestic/Korean producer Samsung and PC OEM Dell are strong evidence that the current price increases and supply shortages in the domestic DRAM market are more significant and of longer duration than can be accounted for by seasonal or one-time factors. Each of these agreements, which are unprecedented in this industry, guarantees the respective DRAM producer a nearly 50 percent share of the purchaser's DRAM requirements, while guaranteeing the purchaser a stable source of supply.<sup>125</sup> These unprecedented supply arrangements are a strong signal that major participants in the domestic DRAM market consider the current short supply conditions in the market to be more pervasive and of longer likely duration than seasonal or one-time factors would suggest.

Finally, we reject for several reasons petitioner's contention that the reported price increases in the second half of 1999 are the result of the pendency of this investigation. First, as discussed above, Taiwan has been a small volume participant in the U.S. market during the period of investigation, with limited overlap between subject product mix and domestic producers' product mix, lessening the likelihood that the prospect of antidumping duties on subject imports would cause price increases of the magnitude that have occurred. Second, as discussed further below, purchasers in the U.S. market source globally from worldwide supply. In fact, third country producers that sell DRAMs manufactured for them by technology partners in Taiwan can supply their U.S. customers with nonsubject DRAMs in the event that antidumping duties are imposed, further lessening the price impact that the prospect of such duties could have. Third, we note that the price increases began in July 1999, many months after the filing of the petition in October

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<sup>123</sup> TSIA Posthearing Brief at Q-28-Q-29 and Exhibit 16. Another one-time factor cited by petitioner is the delayed roll-out of a new Intel product requiring the new Rambus DRAM addressing technology. Petitioner's Posthearing Brief, Exhibit 13 at 4; Hearing Tr. at 53. While Rambus delays may have contributed in a small way to the current DRAM undersupply, there is no evidence that total wafer starts committed to Rambus in recent months account for a large percentage of total production. Moreover, even if fabricators temporarily switch back from Rambus DRAM to SDRAM, petitioner admits that market demand for Rambus is merely delayed, not canceled. Petitioner's Posthearing Brief, Exhibit 15 at 1.

<sup>124</sup> See note 119, *supra*.

<sup>125</sup> See Micron Press Release (Oct. 27, 1999) (Gateway); Micron Press Release (Oct. 25, 1999) (Compaq); "Compaq, Micron in \$20 Bln Chip Deal," Yahoo! News (Oct. 25, 1999) (Compaq/Micron and Dell/Samsung); "Compaq and Micron Technology Announce Strategic Alliance for Memory Supply," located on November 4, 1999 at <http://www.micron.com>; "Compaq, Micron in Chip Deal Worth up to \$20 Billion," New York Times (Oct. 25, 1999); "Compaq Signs Multi-Billion-Dollar DRAM Supply Deal with Micron," Electronic Buyer's News Online (Oct. 25, 1999); "Micron Makes Chip Deal with Gateway," located on Oct. 28, 1999 at <http://dailynews.yahoo.com>; "Gateway and Micron Technology Announce Strategic Memory Supply Agreement," located on Nov. 4, 1999 at <http://www.micron.com>; "Micron Strikes 5-Year Deal with Gateway," located on Nov. 9, 1999 at <http://www.techweb.com>. By contrast, the typical contract in this industry covers a much smaller percentage of the purchaser's requirements and is of much shorter duration. Hearing Tr. at 28-29, 36-37 (share of purchaser requirements allocated quarterly or yearly); Purchaser Questionnaire Responses of \*\*\* at 17 (\*\*\*); Purchaser Questionnaire Response of \*\*\* at Question IV-8 (\*\*\*).

1998 and well after the suspension of liquidation in this investigation on May 28, 1999.<sup>126</sup> Thus, the price trend is not correlated in time with the events which petitioner contends are responsible for it.<sup>127</sup>

Comparisons obtained for the seven pricing products do show a preponderance of underselling by subject imports.<sup>128</sup> We do not find this underselling to be significant, however, for several reasons. First, purchasers reported that price is not always the most important consideration guiding DRAM purchases. Most responding purchasers ranked quality/reliability, availability/delivery, or vendor relationship as more important than price.<sup>129</sup> Equally important for our underselling analysis, most purchasers reported that they seldom change suppliers.<sup>130</sup> In such circumstances, the effects of any underselling are further muted.

Second, about \*\*\* percent of subject imports are produced pursuant to technology partnership agreements and sold by the domestic or third country technology partner under the partner's brand name.<sup>131</sup> The parties agree that these name brand Taiwan products are identical to those sold in the United States by the domestic or third country partner companies sourced from their U.S. or third country fabs.<sup>132</sup> There is no reason why a global producer that serves the United States market with identical DRAMs fabricated in two or more countries would price its Taiwan-fabricated product to undersell its own domestic or nonsubject product in the U.S. market.<sup>133</sup> Thus, we conclude that the underselling is largely accounted for

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<sup>126</sup> "Chip Industry Says It Will Post Strong Gains Through 2003," Wall Street Journal (Oct. 28, 1999); "Chip Industry Experts Predict Strong Demand Will Lift Prices," Wall Street Journal (Nov. 5, 1999).

<sup>127</sup> Petitioner's Posthearing Brief at 3-6. Since even contract prices in the domestic DRAM market can change weekly or even daily, this delay cannot be due to a lag in the market's ability to reflect the effect of the investigation on prices. Hearing Tr. at 27-28, 42-43; Staff Field Trip Notes (Aug. 10, 1999) at 3.

<sup>128</sup> Tables V-1-V-7, CR at V-8-V-11, PR at V-5-V-8.

<sup>129</sup> Tables II-1 and II-2, CR at II-14-II-15, PR at II-9-II-10; TSIA Posthearing Brief, Exhibit 13 at 1 and 7-9; Staff Field Trip Notes (Aug. 10, 1999) at 1, 4 (\*\*\*). Reliability can mean several things in this market. For example, some purchasers require that a vendor be able to supply at least 10-15 percent of the customer's needs for a particular product and/or that the customer not represent more than 50 percent of the vendor's production before the vendor can be qualified. TSIA Prehearing Brief at Exhibit 2. Because some Taiwan producers were still ramping up their DRAM fabs during the period of investigation, not all could meet this standard of reliability for all products. Tables VII-2 and VII-3, CR at VII-4 and VII-6, PR at VII-4 and VII-6. Alternatively, as OEMs have moved to just-in-time inventory systems, they have required vendors to inventory product on the vendor's books but at the customer's location. Petitioner's Posthearing Brief, Exhibit 9 at 2; Staff Field Trip Notes (Aug. 10, 1999) at 3-4. It is not clear that all importers of subject merchandise are able to satisfy these kinds of inventory needs. Vendor relationships would tend to be more important to purchasers that have strict or lengthy qualification requirements, require special inventory arrangements, purchase advanced or specialty product, or require other unusual vendor support.

<sup>130</sup> TSIA Posthearing Brief, Exhibit 13 at 11-12.

<sup>131</sup> Staff Worksheet (Nov. 3, 1999) (Doc. No. 199911045019) (data for interim 1999 for \*\*\*); Table IV-3, CR at IV-7, PR at IV-5; Hearing Tr. at 153-54, 160; TSIA Posthearing Brief at Q4-Q9 and Exhibit 7 at 1; Conf. Tr. at 19-20.

<sup>132</sup> Conf. Tr. at 19-20, 54-56; Petitioner's Prehearing Brief at 18.

<sup>133</sup> This inference is consistent with purchasers' tendency to identify the origin of DRAMs by the

(continued...)

by U.S. sales from own brand Taiwan producers, which accounted for more than half of total subject imports in 1998.<sup>134</sup>

For a variety of reasons, we would expect these own brand Taiwan products to sell for less than name brand DRAMs. First, as discussed above, the overwhelming majority of domestic sales by own brand Taiwan producers take place in the spot market, while the majority of sales by domestic producers are contract sales. It is generally agreed that, in periods of DRAM oversupply such as existed until the last portion of the period of investigation, the spot market price of DRAMs is lower than the contract price by as much as 20 percent.<sup>135</sup> Thus, we would expect domestic prices of DRAMs fabricated by own brand Taiwan producers to be lower than those for the approximately 60-70 percent of domestic DRAMs sold under contract during that period.<sup>136</sup>

In addition, as discussed above, because of the own brand Taiwan producers' technology lag, a significant portion of U.S. sales of DRAMs fabricated by own brand Taiwan producers made during the period of investigation were a density generation or more behind the U.S. producers' principal volume product at any given time. Thus, the underselling on the record is largely in lower density products that are not as important in volume terms to the domestic industry, reducing the significance of the underselling. The significance of the underselling is further reduced because, due to this technology lag, own brand Taiwan product does not enter the United States until new generation products have already exited the introduction phase of the product life cycle when they reap the highest profits for the first producers to market them. Similarly, as discussed above, during the period of investigation own brand Taiwan producers were generally not qualified to supply name brand PC OEMs in the United States. This too lessens the significance of the underselling because it restricts or even eliminates the access of own brand Taiwan product to the domestic industry's major customers. This diminished effect is borne out by the recent supply arrangements concluded by name brand PC OEMs, all of which are with domestic or nonsubject producers.

For the foregoing reasons, we find that there has not been significant underselling by the imported merchandise as compared with the domestic like product in the United States. This conclusion is supported

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<sup>133</sup> (...continued)

nationality of the corporation whose name it bears rather than by the location at which the particular DRAM was fabricated. CR at II-13-II-14, PR at II-8-II-9.

<sup>134</sup> Combined imports from the three own brand Taiwan producers were \*\*\* percent of total imports in 1998. Table IV-1, CR at IV-2, PR at IV-1. Any subject product produced by own brand Taiwan producers and imported by other importers would increase the percentage.

<sup>135</sup> Hearing Tr. at 44-45, 131; Importer Questionnaire Response of \*\*\*, Attachment A at 1.

<sup>136</sup> We do not dispute petitioner's contention that spot and contract prices in the DRAM market affect each other. *See, e.g.*, Petitioner's Posthearing Brief at 7-8; Hearing Tr. at 43-45. Despite the facts that spot and contract prices follow similar trends over the long term and that contract purchasers have access to relatively good information on spot prices on a daily or weekly basis, the record is clear that spot and contract prices are usually not the same, with contract prices exceeding spot prices when DRAM supply exceeds demand and vice versa. In fact, there is some evidence in the record to suggest that, even comparing prices within the spot market, prices for name brand product exceed those for own brand DRAMs from Taiwan. *See* Petitioner's Posthearing Brief, Exhibit 13 (Donaldson, Lufkin & Jenrette, Tech Daily (Oct. 4, 7, and 13, 1999)).

by our inability to confirm any of petitioner's lost sales or lost revenues allegations.<sup>137</sup> Similarly, purchasers almost unanimously reported that they do not consider Taiwan producers to be downward price leaders.<sup>138</sup>

Overall, the evidence of record indicates that subject imports did not lead or contribute to the unusual steepness of the price declines experienced by the domestic industry during most of the period of investigation in any significant way and that the recovery in prices that began late in the period is not the result of the pendency of this investigation. Rather, the price declines and subsequent recovery are accounted for by other factors, including worldwide DRAM supply conditions and the product life cycle. Moreover, the limited extent of competition between domestic and subject merchandise indicates that subject imports could have no more than a *de minimis* effect on overall domestic prices. We also find that any price increases by the domestic industry would be severely constrained in the period of oversupply by the significant domestic market presence of nonsubject imports, which compete more directly on price with the domestic like product than do the bulk of the subject imports.<sup>139</sup> Accordingly, we find that subject imports have not depressed or suppressed prices for the domestic like product to a significant degree.

#### **D. Impact of the Subject Imports on the Domestic Industry**

Section 771(7)(C)(iii) provides that the Commission, in examining the impact of the subject imports on the domestic industry, "shall evaluate all relevant economic factors which have a bearing on the state of the industry." These factors include output, sales, inventories, capacity utilization, market share, employment, wages, productivity, profits, cash flow, return on investment, ability to raise capital, and research and development. No single factor is dispositive and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."<sup>140 141</sup>

Between 1996 and 1998, the domestic industry experienced price declines that exceeded the rate of cost reduction the industry was able to achieve through density increases, die shrinks, and other process improvements. As a consequence, the industry suffered increasing financial losses in each full year of the

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<sup>137</sup> CR at V-25-V-28, PR at V-10-V-11.

<sup>138</sup> TSIA Posthearing Brief, Exhibit 13 at 13. Of the two purchasers that identified one or more Taiwan producers as price leaders, \*\*\* indicated that other reasons, such as quality and reliability, caused it not to consider these producers as suppliers.

<sup>139</sup> CR at II-18-II-19, PR at II-13.

<sup>140</sup> 19 U.S.C. § 1677(7)(C)(iii). *See also* SAA at 851 and 885 and Live Cattle from Canada and Mexico, Inv. Nos. 701-TA-386 and 731-TA-812-813 (Preliminary), USITC Pub. 3155 at 25 n.148 (Feb. 1999).

<sup>141</sup> As part of its consideration of the impact of imports, the statute specifies that the Commission is to consider "the magnitude of the margin of dumping" in an antidumping proceeding. 19 U.S.C. § 1677(7)(C)(iii)(V). In its final determination, Commerce found the following dumping margins: Etron Technology, 69.00 percent; Mosel-Vitelic, 35.58 percent; Nan Ya, 14.18 percent; Vanguard, 8.21 percent; and all others, 21.35 percent. 64 Fed. Reg. 56308, 56327 (Oct. 19, 1999).

period.<sup>142</sup> Because we have found no causal connection between subject import volumes or prices and the decline in domestic DRAM prices in 1996-1998, however, we cannot conclude that the domestic industry's financial troubles are attributable to the subject imports. Moreover, by the first half of 1999, much of the domestic industry reported favorable operating returns and the industry's financial losses overall were beginning to decline significantly, even before the substantial price increases that started later in the year.<sup>143</sup>

We also note that trends in most of the indicators that we generally examine in considering the impact of subject imports on the domestic industry were strongly positive throughout the period of investigation. In particular, the domestic industry experienced rising fabrication capacity, production, shipment quantities, and employment throughout the period.<sup>144</sup>

In the preliminary determination, the Commission expressed concern that declining prices and profits might eventually force the domestic industry to reduce its capital spending and R&D, jeopardizing its ability to develop new DRAM technologies.<sup>145</sup> The record in the final phase indicates that, in fact, capital spending and R&D spending remained strong throughout the period<sup>146</sup> and the domestic industry continues to develop and market leading edge products and technologies.<sup>147</sup>

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<sup>142</sup> Table VI-1, CR at VI-2, PR at VI-2; Memorandum INV-W-260 (Nov. 18, 1999) (Table C-1 revised to exclude Mitsubishi). The industry's operating income margin declined from negative 2.4 percent in 1996 to negative 20.2 percent in 1997 and negative 67.0 percent in 1998.

<sup>143</sup> Table VI-1, CR at VI-2, PR at VI-2; Table IV-4, CR at IV-10, PR at IV-7; Memorandum INV-W-260 (Table C-1 revised to exclude Mitsubishi). The industry's operating income margin was negative 8.4 percent in interim 1999, compared with negative 86.5 percent in interim 1998.

<sup>144</sup> Memorandum INV-W-260 (Table C-1 revised to exclude Mitsubishi). The industry's fabrication capacity utilization was 93 percent or above in all periods except interim 1998, while capacity to produce cased DRAMs and modules was also high throughout the period. *Id.* Because a high level of capacity utilization is a necessity for DRAM fabrication, however, we give limited weight to this factor. Conf. Tr. at 28.

<sup>145</sup> Prelim. Det. at 20-21.

<sup>146</sup> The domestic industry's capital expenditures rose from \$2.07 billion in 1996 to \$2.49 billion in 1997 and \$2.59 billion in 1998. Capital expenditures did decline between the interim periods, from \$1.43 billion in interim 1998 to \$0.71 billion in interim 1999, but we find no record basis to conclude that this represents a reversal of the overall trend in light of the ongoing recovery in the DRAM market. Memorandum INV-W-260 (Table C-1 revised to exclude Mitsubishi). The domestic industry's R&D expenses rose from \$\*\*\* million in 1996 to \$\*\*\* million in 1997 and leveled off at \$\*\*\* million in 1998. R&D expenses were \$\*\*\* million in interim 1999, compared with \$\*\*\* million in interim 1998. Table VI-5, CR at VI-10, PR at VI-4. During the period of investigation, the domestic industry opened multiple new fabs, including two greenfield facilities, and increased its capacity both in terms of wafer starts and in terms of bits. Table III-3, CR at III-15, PR at III-8. Moreover, as petitioner notes, there is partially completed capacity available (including the unfinished Lehi facility \*\*\*) that could be in production in 6 months to a year if demand warrants. Staff Field Trip Notes (Aug. 10, 1999) at 1-2; "Micron Shareholders Keep Eye on Future," Idaho Statesman (Jan. 15, 1999).

<sup>147</sup> See, e.g., "Micron Claims DDR SDRAM Shines in Benchmark Tests," Electronic Buyers' News (Nov. 9, 1999); "Hyundai Samples 256-Mbit SDRAM Using 0.15-Micron Process," Electronic Buyers' News (Nov. 9, 1999); Dominion Field Trip Notes (Nov. 12, 1999); Hearing Tr. at 60-61; Petitioner's Prehearing Brief, Exhibit 1 at 1-2 ("Toshiba to Buy IBM's Stake in Dominion," Electronic News (July 12, 1999) (IBM/Toshiba/Infineon have agreement for joint development of process technology below 0.15 micron through March 2000)).

We find that the domestic industry as a whole has emerged from the downturn in its business cycle well-positioned to compete with subject imports and reject petitioner's contention that the industry's improving financial situation in interim 1999 is a result of the exit of the most injured producers. While petitioner Micron attempts to characterize its purchase of Texas Instruments' ("TI") worldwide DRAM assets as a "fire sale,"<sup>148</sup> we view the petitioner's ability to attract significant amounts of capital investment from TI and Intel as evidence of strength.<sup>149</sup> Indeed, petitioner Micron is now one of the world's three largest DRAM producers and is widely viewed as a global leader in DRAM technology and production. Dominion and White Oak, both greenfield fabs using state-of-the-art technology, opened during the period of investigation. Despite \*\*\* operations during their respective ramp up phases, \*\*\* is now \*\*\* and both are \*\*\* domestic market share.<sup>150</sup> Korean producers Hyundai and Samsung also both opened state-of-the-art production facilities in the United States during the period.<sup>151</sup> Of the six U.S. production facilities closed during the period of investigation, two were assembly facilities, and the others either used 6-inch wafers, which are no longer the industry standard, had wafer start capacities below the level that is currently considered the minimum for economic operation, or both.<sup>152</sup> Although IBM has been \*\*\* domestic producers during the period of investigation, its \*\*\*.<sup>153</sup> Similarly, the financial results of Fujitsu, also \*\*\*.<sup>154</sup>

Overall, the industry had already begun a financial recovery in interim 1999. Price increases in the second half of the year could only have contributed to further improvements in the industry's financial condition through our record-closing date in November. All other indicators are positive and the industry

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<sup>148</sup> Conf. Tr. at 13-14.

<sup>149</sup> In 1998, petitioner Micron experienced \*\*\* during the period of investigation. Table VI-3, CR at VI-5, PR at VI-3. In that same year, Micron acquired Texas Instruments' worldwide DRAMs assets, and received equity infusions from both Texas Instruments and Intel. While petitioner argues that the change in its business practices from financing all operations and growth out of cash flow to selling equity and issuing debt is evidence of injury by reason of subject imports, Hearing Tr. at 21-22, the company has publicly characterized the terms of these deals as favorable to Micron. See, e.g., TSIA Prehearing Brief, Exhibit 4 ("Micron's Appleton Loves His DRAM Deal with Texas Instruments," Semiconductor Business News (July 1, 1998)). Cf., TSIA Posthearing Brief, Exhibit 2 (Merrill Lynch reviews of Micron stock dated Oct. 1 and Oct. 5, 1999).

<sup>150</sup> CR at III-4-III-5, III-11-III-12, PR at III-2-III-4; Table VI-3, CR at VI-7, PR at VI-3. \*\*\* did not report financial data.

<sup>151</sup> CR at III-6, III-10, PR at III-3, III-5.

<sup>152</sup> Some also produced legacy products. CR at III-5-III-11, PR at III-3-III-6; Petitioner's Posthearing Brief at Exhibit 7; TSIA Posthearing Brief at Exhibit 8. Petitioner refers to the closure of domestic fabs by \*\*\*, but \*\*\* and therefore do not reflect exits from the industry. Although Motorola is exiting the industry, the domestic fab that it helped to create (White Oak) continues to operate \*\*\* under other ownership. In any event, Motorola was using its share of the fab to produce SRAMs, not DRAMs. Petitioner's Prehearing Brief, Exhibit 10. The TwinStar facility, which Micron closed after acquiring it from TI in 1998, has been maintained as a research facility and could be reopened as a fab under appropriate demand conditions.

<sup>153</sup> CR at III-6-III-7, PR at III-3-III-4; Table VI-3, CR at VI-7, PR at VI-3; Table III-4, CR at III-16, PR at III-9 (\*\*\* in interim 1999). \*\*\*. Producer Questionnaire Response of \*\*\*.

<sup>154</sup> Table VI-3, CR at VI-7, PR at VI-3; Petitioner's Posthearing Brief, Exhibit 7 at 1; Tables E-1 and E-2, CR at E-3-E-8, PR at E-3. Fujitsu \*\*\* and has stated that it is \*\*\*. Table III-1, CR at III-3, PR at III-2; CR at M-3, PR at M-3.

has maintained its technological leadership. In light of the lack of significant volumes of subject imports and significant price effects, the high level of investments by the domestic industry, and the improving trend in the industry's financial condition, we do not find that the subject imports are presently having an adverse impact on the domestic industry.

### III. NO THREAT OF MATERIAL INJURY BY REASON OF SUBJECT IMPORTS

Section 771(7)(F) of the Act directs the Commission to determine whether the U.S. industry is threatened with material injury by reason of the subject imports by analyzing whether "further dumped or subsidized imports are imminent and whether material injury by reason of imports would occur unless an order is issued . . . ." <sup>155</sup> The Commission may not make such a determination "on the basis of mere conjecture or supposition," and considers the threat factors "as a whole" in making its determination whether dumped imports are imminent and whether material injury by reason of imports would occur unless an order is issued. <sup>156</sup> In making our determination, we have considered all statutory factors that are relevant to this investigation. <sup>157</sup> For the reasons discussed below, we find that the domestic DRAMs industry is not threatened with material injury by reason of subject imports.

Over the period examined, domestic consumption of DRAMs and imports of subject merchandise have both increased in roughly the same proportion. <sup>158</sup> Subject imports' share of domestic consumption has been low throughout the investigation period and increased by less than \*\*\* percentage points, as discussed in our analysis of no present material injury. <sup>159</sup> We anticipate that Taiwan's share of the U.S. market will continue to be small, particularly compared to the shares of U.S. producers and nonsubject imports, which have been substantially larger than Taiwan's throughout the investigation period. <sup>160</sup> The new supply arrangements with Compaq, Gateway, and Dell guarantee domestic and nonsubject producers a large share of future name brand PC OEM demand for DRAMs. <sup>161</sup> These new supply arrangements reduce the likelihood that own brand Taiwan producers (who accounted for a majority of subject imports during the investigation period) will be able to significantly increase the volume of their imports to the United States or their U.S. market share in the imminent future. Moreover, we note that Taiwan is a large consumer and a net importer of DRAMs, and is the world's largest producer of motherboards. <sup>162</sup> The share of Taiwan's production of subject merchandise that is exported to the United States has been small in comparison to the share sold in the home- and third-country markets throughout the investigation period, and there is no information on the record indicating that demand from those markets is decreasing or that

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<sup>155</sup> 19 U.S.C. §§ 1673d(b)(1) and 1677(7)(F)(ii).

<sup>156</sup> 19 U.S.C. § 1677(7)(F)(ii).

<sup>157</sup> 19 U.S.C. § 1677(7)(F)(i). Factor I is inapplicable because no subsidies are alleged. Factor VII is inapplicable because this investigation does not involve imports of a raw agricultural product.

<sup>158</sup> Table IV-3, CR at IV-7, PR at IV-5.

<sup>159</sup> *See supra* § II.B.

<sup>160</sup> Table C-1, at CR C-3, PR at C-3.

<sup>161</sup> *See supra* note 125.

<sup>162</sup> *See, e.g.*, TSIA Prehearing Brief at 48; Hearing Tr. at 135-36.

Taiwan will abandon those markets in the imminent future.<sup>163</sup> Accordingly, we conclude that the volume and market penetration of imports of the subject merchandise is not likely to increase substantially in the imminent future.

Furthermore, there is no indication of increased capacity or excess production capacity in Taiwan that would suggest the likelihood of substantially increased imports. Although the Taiwan industry brought more new wafer start capacity on line during the investigation period than did producers in any other country, Taiwan began at a low base.<sup>164</sup> Moreover, as the new wafer start capacity comes on line in Taiwan, Taiwan producers' capacity utilization has been and is projected to remain at high levels in 1999 and 2000 (above 85 percent) for both cased and uncased DRAMs.<sup>165</sup> This increased DRAMs capacity during the investigation period has not resulted in a flood of subject imports to the United States because of the significance of Taiwan's home and third-country markets.<sup>166</sup> Although petitioner pointed to press reports suggesting very large planned capacity increases in Taiwan, we note that many of the more ambitious plans for expansion announced in the press failed to materialize when the market experienced an extended downturn in prices, and that a number of the semiconductor capacity increases to which petitioner refers are not specific to DRAMs.<sup>167</sup> Thus, we find that any capacity increases have not been, and are not likely in the imminent future to be, at nearly the level that petitioner indicated. Based on this evidence we do not conclude that the existence of additional or unused production capacity, or imminent increases in capacity, indicate a likelihood of substantially increased imports of subject merchandise into the United States.

Petitioner argues that Taiwan producers, particularly foundries, are likely to shift production from non-DRAM products to DRAMs.<sup>168</sup> We agree that it is technically possible for foundries and some other semiconductor producers to shift capacity to DRAM production. We find, however, that the record does not support the conclusion that product shifting to DRAMs is likely because worldwide demand for semiconductor products in general, not just for DRAMs, is projected to outweigh supply in the imminent future, and industry reports indicate that semiconductor producers have not expanded capacity in pace with demand.<sup>169</sup> Indeed, record evidence indicates that some Taiwan producers have shifted production away

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<sup>163</sup> Tables O-1, O-2, and O-3, CR at O-3 to O-8, PR at O-3 to O-6 (according to foreign producer questionnaire responses the percentage of subject uncased DRAMs, cased DRAMs, and DRAM modules shipped to home- and third-country markets was \*\*\* in 1998, and is projected to be \*\*\*, respectively in 1999 and 2000). We note that Taiwan producers are not subject to antidumping or countervailing duty orders elsewhere in the world, so production is not likely to be diverted from other markets to the United States.

<sup>164</sup> Tables O-1 and O-2, CR at O-3, O-5, PR at O-3 to O-6.

<sup>165</sup> Tables O-1 to O-2, CR at O-3 to O-6, PR at O-3 to O-6.

<sup>166</sup> Tables O-1, O-2, and O-3, CR at O-3 to O-8, PR at O-3 to O-6.

<sup>167</sup> Appendix N, CR at N-2 to N-6, PR at N-3 to N-7; TSIA Posthearing Brief at Exhibit 10.

<sup>168</sup> Petitioner's Prehearing Brief at 76-78.

<sup>169</sup> See, e.g., Dean Takahashi, "Chip Industry Says It Will Post Strong Gains Through 2003," Wall Street Journal (Oct. 28, 1999); "Dataquest Warns Capital Spending Won't Keep Up With Chip Demand," Electronic Buyers' News, located on Nov. 2, 1999, at <http://www.ebnonline.com>; "Dataquest: Chip Industry Will Hit \$250B by 2002," Electronic Buyers' News, located on Nov. 2, 1999, at <http://www.ebnonline.com>; Dean Takahashi, "Chip  
(continued...)

from DRAMs to other semiconductor products.<sup>170</sup> Under these market conditions, we see no reason why Taiwan producers would abandon other profitable semiconductor markets to convert facilities to DRAM production. Accordingly, we conclude that there is little threat that Taiwan producers will engage in product shifting to DRAMs in the imminent future.

U.S. importer and foreign producer inventories increased slightly during the period as reflected by the questionnaire data, but given the widespread reports of producers putting customers on allocation, we expect that inventories have largely, if not entirely, disappeared in the intervening months.<sup>171</sup> In any event, the parties have not argued that inventories play a significant role in this case,<sup>172</sup> and we attributed little weight to this factor in our threat analysis.

As stated above, subject imports at current volumes and prices have not had any significant adverse effects on prices for the domestic like product in the United States.<sup>173</sup> We find no record basis for concluding that adverse price effects are likely to occur in the imminent future, particularly in light of record evidence indicating that stable or rising prices and a shortage in DRAMs supply world-wide are likely to continue into 2000 and perhaps beyond.<sup>174</sup> The effect of any underselling by subject imports during the investigation period has been greatly attenuated by differences in product mix, pricing practices, and ability to satisfy PC OEM qualification requirements, as well as by the small market share of subject imports.<sup>175</sup> Petitioner argues that, as the technology gap between Taiwan and other producers lessens, Taiwan producers increasingly will become qualified to supply the major consumers of DRAMs, thereby reducing attenuating factors.<sup>176</sup> While we decline to speculate how quickly own brand Taiwan producers might become qualified suppliers to name brand PC OEMs, we find that in a market characterized by short supply and stable or rising prices, own brand Taiwan producers that are able to qualify for PC OEM sales

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<sup>169</sup> (...continued)

Industry Expected to Thrive for Years,” Wall Street Journal (Oct. 28, 1999).

<sup>170</sup> CR at N-4 to N-6, PR at N-5 to N-7.

<sup>171</sup> Table VII-4, CR at VII-8, PR at VII-7; Table VII-5, CR at VII-9, PR at VII-8.

<sup>172</sup> TSIA Prehearing Brief at 55, Exhibit 15; Petitioner’s Posthearing Brief Exhibit 6 at 2-3.

<sup>173</sup> *See supra* § II.C.

<sup>174</sup> *See, e.g.*, “Micron Technology Says Memory Chip Demand Overwhelming,” AFX News (Oct. 5, 1999) (citing Petitioner’s Chief Executive Officer, Steve Appleton’s observations that demand for the company’s memory chips is “overwhelming” and all of the company’s product lines are on allocation, and that given the “amount of volume of business we are turning away, I don’t see any downward pressure on prices.”); Brian Fuller, “Double-digit Chip Growth Forecast for Next Three Years,” Semiconductor News, located on Nov. 2, 1999, at <http://www.eetimes.com>; Jonathan Cassell, “DRAM Market Back in Gear,” Electronic News (Mar. 29, 1999), a copy of which is provided in Respondent’s Prehearing Brief, Exhibit 7; Dean Takahashi, “Chip Industry Says It Will Post Strong Gains Through 2003,” Wall Street Journal (Oct. 28, 1999); “Dataquest Warns Capital Spending Won’t Keep up with Chip Demand,” Electronic Buyers’ News, located on November 2, 1999, at <http://www.ebnonline.com>; “Dataquest: Chip Industry Will Hit \$250B by 2002,” Electronic Buyers’ News, located on Nov. 2, 1999, at <http://www.ebnonline.com>; Dean Takahashi, “Chip Industry Expected to Thrive for Years,” Wall Street Journal (Oct. 28, 1999).

<sup>175</sup> *See supra* § II.A.

<sup>176</sup> Petitioner’s Prehearing Brief at 73-75.

would have little incentive to significantly undersell the domestic industry and, given their relative size, little ability to lead prices down in any event. Accordingly, we do not find that subject imports are entering at prices that are likely to have a significant depressing or suppressing effect on domestic prices or are likely to increase demand for further subject imports.

In light of the foregoing,<sup>177</sup> we do not find that subject imports are having or are likely to have negative effects on the development and production efforts of the domestic industry. Rather, as discussed above in our analysis of no present material injury, the domestic industry emerged from the downturn in its business cycle well-positioned to compete with subject imports.<sup>178</sup> Improving trends in prices that began in July 1999 are expected to continue in the imminent future.<sup>179</sup> Moreover, throughout the investigation period, the industry continued to increase capacity and invest in capital improvements and research and development.<sup>180</sup>

As noted earlier, three of the largest domestic name brand PC OEMs have recently entered into multi-year, multi-billion dollar supply agreements with domestic producers Micron and Samsung.<sup>181</sup> The willingness of these major consumers of DRAMs to enter into such agreements, which are unprecedented in this industry, lends credence to industry analysts' forecasts<sup>182</sup> of a continued tight supply of DRAMs and higher prices in the near future.<sup>183</sup>

Finally, there are no other demonstrable adverse trends that indicate the probability the domestic industry is likely to be materially injured by reason of subject imports.

Evaluating all of the relevant statutory threat factors, we find that the record indicates neither that substantially increased volumes of subject DRAMs are imminent nor that material injury by reason of subject imports would occur absent issuance of an antidumping duty order. Accordingly, we determine that the domestic DRAMs industry is not threatened with material injury by reason of subject imports from Taiwan.

## CONCLUSION

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<sup>177</sup> *See also supra* § II.D.

<sup>178</sup> *See id.*

<sup>179</sup> *See, e.g.*, Jonathan Cassell, "DRAM Market Back in Gear," Electronic News (Mar. 29, 1999), a copy of which is provided in TSIA Prehearing Brief at Exhibit 7.

<sup>180</sup> *See supra* § II.D.

<sup>181</sup> *See supra* note 125.

<sup>182</sup> *See supra* note 170.

<sup>183</sup> The emergence of five-year, guaranteed supply agreements covering nearly a majority of a consumer's requirements, distinguishes the present situation from earlier unrealized optimistic forecasts referenced by petitioner. *See, e.g.*, Hearing Tr. at 96.

For the foregoing reasons, we determine that the domestic DRAMs industry is neither materially injured nor threatened with material injury by reason of imports of DRAMs from Taiwan that were found to be sold in the United States at less than fair value.



## DISSENTING VIEWS OF CHAIRMAN LYNN M. BRAGG

I find that the domestic industry producing dynamic random access memory semiconductors (DRAMs) is materially injured by reason of imports of the subject merchandise from Taiwan which are sold in the United States at less-than-fair-value.

### OVERVIEW

The record indicates that over the period of investigation (“POI”), subject imports entered the United States in increasingly significant volumes as prices for both domestic and subject merchandise dropped precipitously and financial losses in the domestic industry mounted. While there were several factors which contributed to the industry’s financial losses, such as the Asian economic crisis and the presence of non-subject imports, I find that the volume of subject imports was significant, and that this volume had significant adverse price effects, particularly in the key 16 megabit product category, which resulted in a significant adverse impact on the domestic industry.

My determination is based primarily upon my finding that subject imports competed in all segments of the U.S. market, impacting both contract prices and prices in the spot market, and thereby significantly impeding the domestic industry’s ability to generate adequate revenue streams. As a result, a majority of the domestic industry was forced to finance capital expenditures and research and development through debt accumulation rather than from cash flow accruing from operations, thereby adversely impacting credit ratings as well as the costs and availability of future funding.

### ANALYSIS

#### I. LIKE PRODUCT

As I did in the preliminary determination, I define the domestic like product<sup>1</sup> consistent with the scope of the investigation as determined by the Department of Commerce, namely: all DRAMs, regardless of density, including cased and uncased DRAMs; DRAMs assembled into modules; and speciality DRAMs. I note that all parties support this like product definition.

#### II. DOMESTIC INDUSTRY

In the preliminary investigation, the Commission found that the domestic industry corresponded to producers of only a subset of the domestic like product. Specifically, the Commission included in the domestic industry companies that produce DRAM chips and/or assemble uncased DRAMs into cased DRAMs. Excluded from the domestic industry were companies that assemble cased DRAMs into memory modules (products which were included in the domestic like product definition) and “fabless” design houses.<sup>2</sup>

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<sup>1</sup> 19 U.S.C. § 1677(10). In analyzing domestic like product issues, the Commission generally considers a number of factors including: (1) physical characteristics and uses; (2) interchangeability; (3) channels of distribution; and (4) customer and producer perceptions of the products.

<sup>2</sup> Fabless design houses focus on the design stage of DRAM production and then contract out the production of DRAMs to foundry producers. A facility that fabricates DRAMs is called a “fab.”

The Commission excluded module producers because these entities appeared to add little value to cased DRAMs and were relatively unsophisticated operations, in contrast to the extremely sophisticated fabrication facilities. Fabless design houses were excluded because the Commission determined that they did not manufacture the like product.

Based on the record in this final phase investigation, I determine that there is no new information which warrants deviating from the Commission's preliminary determination regarding the definition of the domestic industry. I therefore find that the domestic industry includes companies that fabricate and/or assemble DRAMs in the United States, but does not include module assemblers and/or fabless design houses.

### III. RELATED PARTIES

Having defined the domestic industry, I next consider whether to exclude any domestic producers from the industry as related parties.<sup>3</sup> In the preliminary determination, the Commission excluded the domestic producer Mitsubishi from the domestic industry as a related party, finding that Mitsubishi's primary interests lie principally in importation rather than in domestic production.<sup>4</sup> Neither party addressed the issue of related parties in this final phase investigation.

Consistent with the Commission's preliminary determination, I find that the record in this final phase investigation supports the exclusion of Mitsubishi from the domestic industry as a related party based upon my finding that Mitsubishi's primary interests lie in importation of the subject merchandise.

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<sup>3</sup> Domestic producers are "related parties" if they import subject merchandise, or if they directly or indirectly control or are controlled by a subject foreign producer or exporter. 19 U.S.C. § 1677(4)(B). In appropriate circumstances, such related parties may be excluded from the domestic industry. The primary factors the Commission examines in deciding whether appropriate circumstances exist to exclude the related parties include:

- (1) the percentage of domestic production attributable to the importing producer;
- (2) the reason the U.S. producer has decided to import the product subject to investigation, i.e., whether the firm benefits from the LTFV sales or subsidies or whether the firm must import in order to enable it to continue production and compete in the U.S. market; and
- (3) the position of the related producers vis-a-vis the rest of the industry, i.e., whether inclusion or exclusion of the related party will skew the data for the rest of the industry.

19 U.S.C. § 1677(4)(B).

<sup>4</sup> Mitsubishi's imports of subject merchandise rose from \*\*\* in 1995 and 1996 to \*\*\* percent of its domestic production in 1997 and \*\*\* percent of its domestic production in 1998. Table III-2, CR at III-13.

My review of the record further indicates that several other domestic producers may also be related parties.<sup>5</sup> I find, however, that the primary interests of each of these domestic producers lie in domestic production, not importation. I therefore determine that appropriate circumstances do not exist to exclude these producers from the domestic industry.

#### IV. **CAPTIVE PRODUCTION**

Data collected in this final phase investigation indicate that the domestic industry consumed approximately five percent of production (by volume) internally in 1998. I therefore considered whether the captive production provision applies to this final phase investigation.<sup>6 7</sup> Upon review of the record, I determine that the volume of captive production evidenced in this investigation does not rise to the level of “significant,” as required by statute.<sup>8</sup> Finding that the threshold criterion of “significant” captive production is not met, I determine that the captive production provision does not apply.<sup>9</sup>

#### V. **MATERIAL INJURY BY REASON OF THE SUBJECT IMPORTS**

For the reasons discussed below, I find that the domestic industry producing DRAMs is materially injured “by reason of” subject imports from Taiwan which are sold in the United States at less-than-fair-value.<sup>10</sup> In making this determination, as directed by statute, I have considered the volume of imports, their effect on prices for the domestic like product, and their impact on domestic producers of the domestic like product, but only in the context of U.S. production operations.<sup>11</sup> I have also evaluated all relevant economic factors within the context of the business cycle and other conditions of competition distinctive to the DRAMs industry.<sup>12</sup>

##### A. **Conditions of competition**

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<sup>5</sup> In addition to Mitsubishi, the following domestic producers may be considered related parties by virtue of their having: (1) imported subject merchandise during the POI; or (2) corporate or contractual relationships with Taiwan producers that involved direct or indirect control: \*\*\*.

<sup>6</sup> CR at III-19.

<sup>7</sup> 19 U.S.C. § 1677(7)(C)(iv).

<sup>8</sup> Neither the statute nor legislative history define what level of production is “significant.” The SAA does state, however, that the Commission should determine “significance” on a case-by-case basis and that “[c]aptive production and merchant sales are significant if they are of such magnitude that a more focused analysis of market share and financial performance is needed for the Commission to obtain a complete picture of the competitive impact of imports on the domestic industry.” SAA at 852.

<sup>9</sup> 19 U.S.C. § 1677(C)(iv).

<sup>10</sup> 19 U.S.C. § 1673d(b).

<sup>11</sup> 19 U.S.C. § 1677(7)(B)(i). The Commission “may consider such other factors as are relevant to the determination” but shall “explain in full its relevance to the determination.” 19 U.S.C. § 1677(7)(B)(ii).

<sup>12</sup> 19 U.S.C. § 1677(7)(C)(iii).

A key condition of competition in the domestic DRAM industry is the DRAM life cycle (which lasts approximately three years). As each new succeeding generation of DRAM is introduced to the market, costs of production and, accordingly, 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 the incidence of defects and improving yields. In the mature phase of the product cycle, costs and prices are generally lowest. Thus, prices for each new generation of DRAMs are expected to decline sharply at the beginning of the cycle, followed by flatter trends as the generation matures.

As a result of the rapid technological advances associated with the DRAM life cycle, domestic producers must constantly make large investments in capital equipment and research and development to develop higher density DRAMs, increase production yields, and develop faster interface technologies. It is generally expected that as a result of these investments and subsequent production advances, domestic producers will generate the significant cash flow necessary to fund the ongoing investments. However, this can only occur if domestic producers are able to maximize profits in the early stage of a given cycle. If domestic producers are unable to maximize profits, for example as a result of unfair price competition in the early stage of the cycle, then domestic producers must seek alternate sources of funding for the development of succeeding products, likely at the cost of reduced credit ratings and higher interest payments.

During the preliminary phase, the Commission found that the period of investigation coincided roughly with the life cycle of the 16 megabit DRAM, with production switching from 4 to 16 megabit DRAMs early in the period, and from 16 to 64 megabit DRAMs at the end of the period. In this final phase of the investigation, domestic producers and importers continued to shift their focus from 16 megabit to 64 megabit DRAM production.

The next key condition of competition is the high degree of substitutability of subject imports with the domestic like product. The vast majority of questionnaire responses indicated that there are no perceived differences between subject imports and the domestic like product, and no perceived advantages for either category.<sup>13</sup>

DRAMs fabricated in Taiwan generally fall into two categories, which roughly define respective technology levels: (1) DRAMs produced in cooperation with a technology partner (tier one); and (2) DRAMs produced by fabricators using their own designs (tier two). Importantly, any distinguishing technology gap between tier-one and tier-two producers decreased significantly over the POI, as nearly all Taiwanese DRAM producers entered production and/or technology partnerships with leading global DRAM producers.<sup>14</sup> Tier-one producers sell a majority of their products to PC OEMs while tier-two producers sell mainly into the aftermarket (to customers with less stringent requirements, and those buying DRAMs incorporating older technologies).<sup>15</sup>

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<sup>13</sup> CR at II-15.

<sup>14</sup> CR at VII-2.

<sup>15</sup> CR at II-17-18. The non-PC OEM market is primarily comprised of memory board producers, small PC clone producers, manufacturers of equipment other than PCs, and value-added resellers.

There are four main types of DRAM purchasers: brokers/distributors of cased or uncased DRAMs; module manufacturers; brokers/distributors of memory modules; and OEMs. According to responses to the Commission's questionnaires, sales of U.S.-produced DRAMs to OEMs accounted for at least \*\*\* percent of the total sales of three U.S. producers in 1999.<sup>16</sup> Each of these companies also made roughly \*\*\* percent of their sales to brokers or distributors, and their remaining sales to value-added resellers, module makers, and the aftermarket.<sup>17</sup> In contrast, responses from eight companies that imported DRAMs from Taiwan indicated that roughly 20 percent of their U.S. sales by volume went to OEMs, 55 percent of U.S. sales to value-added resellers/module manufacturers, and 25 percent to brokers or distributors.<sup>18</sup>

In addition, the record indicates that a majority of the firms that sold subject imports in the United States during the POI either sold subject imports to tier-one purchasers or are qualified suppliers to tier-one purchasers, directly contradicting respondents' claim that Taiwanese DRAM producers are not competitive in the U.S. tier-one market.<sup>19</sup>

Another important condition of competition in this investigation is that contract sales are often tied to prices in the spot market, where a majority of subject imports are sold. Any negative price effects in the spot market resulting from unfairly traded imports will directly impact contract prices. Consequently, domestic producers' contract sales tied to the spot market are directly affected by adverse price effects of unfairly traded subject imports sold into the spot market.

Finally, I note the recent supply agreements between Micron and Compaq and Micron and Gateway. The record does not establish that these supply agreements guarantee Micron a set price for its DRAMs sold to either Compaq or Gateway. Thus, these agreements cannot be relied upon to obviate adverse price affects resulting from the unfairly traded subject imports, particularly if these agreements are tied to spot market prices.

## B. Volume

On a megabit basis, imports from Taiwan increased from 356,921 billion bits in 1996 to 2,464,169 billion bits in 1998, a 590 percent increase.<sup>20</sup> In addition, the market share in terms of quantity of subject imports increased from 4.7 percent in 1996 to 6.4 percent in 1998, before dropping to \*\*\* percent in interim 1999, compared to 5.3 percent in interim 1998, likely the result of the filing of the petition.<sup>21</sup>

As a share of value of total domestic DRAM sales, subject imports increased from 4.3 percent in 1996, to 6.2 percent in 1997, and then to 7.1 percent in 1998.<sup>22</sup> Between the interim periods, subject imports' share of value increased from 6.5 percent in interim 1998 to \*\*\* percent in interim 1999.<sup>23</sup> In

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<sup>16</sup> CR at II-1.

<sup>17</sup> CR at I-6.

<sup>18</sup> CR at I-6.

<sup>19</sup> See Table IV-3, CR at IV-7; CR at I-16, II-4, and II-5.

<sup>20</sup> Table IV-2, CR at IV-4; CR at IV-6.

<sup>21</sup> CR at IV-9.

<sup>22</sup> CR at IV-9.

<sup>23</sup> CR at IV-9.

addition, Taiwan's share of U.S. imports on a quantity basis rose during the period from roughly \*\*\* percent in 1996 to nearly \*\*\* percent in interim (January-June) 1999.<sup>24</sup>

The record also shows that the market share of non-subject imports was relatively steady during the POI. On a quantity basis, non-subject import penetration moved only slightly, from 64.7 percent in 1996 to 63.3 percent in 1998.<sup>25</sup> Between the interim periods, non-subject import market share declined from 65.7 in interim 1998 to \*\*\* percent in interim 1999.<sup>26</sup> I note, however, that the decline in non-subject market share between the interim periods is largely attributable to a reduction in the volume of DRAM imports from Korea. Accordingly, subject imports increased their market share at the expense of U.S. producers' market share and not non-subject import market share.

Based upon the foregoing, I determine that volume of subject imports is significant.

### C. Price

The pricing information gathered by the Commission shows a pattern of substantial underselling for all Taiwanese products, extending across all product densities and including both the OEM and non-OEM markets.

Upon review of the full record in this final phase, I determine that given the coincidence of the POI with the 16 megabit product life cycle, the 16 megabit category is the clearest and most relevant indicator of the impact of subjects imports on domestic industry pricing. In 1996, as Taiwan was just beginning to ship 16 megabit DRAMs, subject imports of this product entered at average prices \*\*\* imports from Korea and Japan, and \*\*\* domestic prices.<sup>27</sup> As prices for this product from all sources continued to fall in 1997, Taiwan remained the \*\*\*.<sup>28</sup> By 1998, all prices had funneled together, reaching a low point before rising slightly in the first half of 1999, when Taiwan had the \*\*\* for this product.

Average unit values for subject merchandise product 2 (16 Megabit EDO DRAMs) sold to OEMs were priced below the average unit values for the domestic like product in every month in which comparisons could be made.<sup>29</sup> In addition, subject merchandise product 3 (16 Megabit Synchronous DRAMs) sold to OEM customers was priced below the price for the equivalent domestic like product in 18 of 20 months for which prices could be compared.<sup>30</sup>

I also note that with respect to products 2 and 3 sold to non-OEM purchasers, margins were either mixed or indicated overselling by the subject imports. This finding is qualified, however, by the fact that the U.S. importer \*\*\*.<sup>31</sup>

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<sup>24</sup> CR at IV-5.

<sup>25</sup> CR at IV-10.

<sup>26</sup> CR at IV-10.

<sup>27</sup> See Table V-1-14, CR at V-8-24.

<sup>28</sup> See Table V-1-14, CR at V-8-24.

<sup>29</sup> CR at V-6.

<sup>30</sup> CR at V-6.

<sup>31</sup> CR at V-6-7.

There were also limited reported sales of Taiwan-fabricated products 4 and 5 (64 Megabit DRAMs) to OEM customers in the POI.<sup>32</sup> Taiwan-fabricated products 4 and 5 sold to OEM customers undersold domestic products in every month for which comparisons could be made.<sup>33</sup> Taiwan sales to non-OEMs of product 4 merchandise undersold the domestic product in 12 of 15 months in which comparisons could be made. Taiwan product 5 undersold the domestic product in 6 of 12 months.<sup>34</sup>

As a result of the pervasive underselling by subject imports over the POI, domestic average unit values decreased from \$1.03 per million bits in 1996, to \$0.43 per million bits in 1997, to \$0.14 per million bits in 1998.<sup>35</sup> Between the interim periods, average unit values decreased from \$0.17 per million bits in interim 1998 to \$\*\*\* per million bits in interim 1999.<sup>36</sup> While one would expect prices to decline as a result of the DRAM life cycle, subject imports accelerated price declines, thereby depriving the domestic industry of the ability to generate adequate revenue streams for succeeding product development.

I find that the trend towards decreased patterns of underselling for the key 16 megabit category which occurred towards the latter part of the POI was partly a result of domestic producers abandoning this product category to the Taiwan imports as domestic producers accelerated the shift to a higher density generation in hopes of obtaining better returns. The trend towards pricing equilibrium is also attributable to domestic producers lowering their prices to match the prices of subject imports.

Based upon all the foregoing, I conclude that the significant volume of undersold subject imports have accelerated the normal price decline to be expected as a result of the DRAM cycle, thus resulting in significant price depression.

#### D. Impact

The combined net sales value of domestic DRAM producers decreased in each fiscal year, contributing to increasing operating losses in each year. The domestic industry reported operating losses of negative \$68 million in 1996, negative \$560 million in 1997, and negative \$1.5 billion in 1998.<sup>37</sup> Between the interim periods, operating losses decreased from negative \$841 million in interim 1998 to negative \$182 million in interim 1999.<sup>38</sup> Only \*\*\*.<sup>39</sup> Net margins were negative 3.2 percent in 1996, negative 33.2 percent in 1997, and negative 79.4 percent in 1998.<sup>40</sup> Between the interim periods, net losses improved from negative 97.3 in interim 1998 to negative 13.2 in interim 1999.<sup>41</sup>

Next, I find that over the POI most of the domestic industry's capital expenditures were funded through debt accumulation rather than from cash flow accruing from operations. Therefore, the domestic

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<sup>32</sup> CR at V-7.

<sup>33</sup> CR at V-7.

<sup>34</sup> CR at V-6.

<sup>35</sup> Table C-1, CR at C-4.

<sup>36</sup> Table C-1, CR at C-4.

<sup>37</sup> Table VI-1, CR at VI-2.

<sup>38</sup> Table VI-1, CR at VI-2.

<sup>39</sup> CR at VI-4.

<sup>40</sup> Table VI-1, CR at VI-2.

<sup>41</sup> Table VI-1, CR at VI-2.

industry became increasingly vulnerable because it cannot be expected to continue to fund capital expenditures via debt accumulation indefinitely. For example, \*\*\*.

Based on my finding that a significant volume of subject imports have depressed domestic prices to a significant degree, and because those price declines have materially contributed to large financial losses for the vulnerable domestic industry and compromised the industry's critical ability to fund the development of the succeeding generation of DRAMs, I find that the subject imports have had a significant adverse impact on the domestic industry. I therefore conclude that the domestic industry is materially injured by reason of the subject imports.

Finally, I find that the material injury by reason of the subject imports from Taiwan is distinct from, and cannot be attributed to, imports from other countries. On a value basis, domestic producers' market share fell from 30.3 percent in 1996 to 27.9 percent in 1998, while subject imports market share rose from 4.3 percent in 1996 to 7.1 percent in 1998.<sup>42</sup> In addition, in terms of both quantity and value, Taiwan's share of total U.S. imports rose during the POI, from roughly \*\*\* percent in 1996 to nearly \*\*\* percent in interim 1999, while the volume of non-subject imports remained relatively steady.<sup>43</sup>

### CONCLUSION

Based on all of the foregoing, I find that the domestic industry producing DRAMs is materially injured by reason of imports of the subject merchandise from Taiwan sold in the United States at less-than-fair-value.

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<sup>42</sup> CR at IV-9.

<sup>43</sup> CR at IV-6.