The *Industry Trade and Technology Review (ITTR)* is a quarterly staff publication of the Office of Industries, U.S. International Trade Commission. The opinions and conclusions contained in this report are those of the authors and are not the views of the Commission as a whole or of any individual Commissioner. The report is intended to provide analysis of important issues and insights into the global position of U.S. industries, the technological competitiveness of the United States, and implications of trade and policy developments.

The information and analysis in this series are for the purpose of this report only. Nothing in this report should be construed to indicate how the Commission would find in an investigation conducted under any statutory authority.

Inquiries or comments on items in this report may be made directly to the author, or to:

Director of Industries  
U. S. International Trade Commission  
500 E Street, SW  
Washington, DC 20436  
Fax: 202-205-3161

*Industry Trade and Technology Review* is posted on the Commission’s Internet site at [www.usitc.gov](http://www.usitc.gov) (Publications). Requests for copies of the ITTR, or to be added to the mailing list, should be addressed to the Office of the Secretary, U.S. International Trade Commission, 500 E Street SW, Washington, DC 20436, or by fax: 202-205-2104

### Quarterly Review Staff

Larry Brookhart  
Karl Tsuji  

*assisted by*  

Zema Tucker  
Sharon Greenfield  
Monica Reed

### Contributing Authors

Christopher Johnson  
Richard Brown  
Robert Feinburg

### Robert A. Rogowsky  
*Director of Operations  
Acting Director of Industries*
Listing of Published Articles
(March 1999 - August 2003)

March 1999
Korea’s foreign exchange crisis and its implications for U.S.-Korean trade
Advanced structural ceramics: Vast potential has yet to be realized

June 1999
Energy services: Recent trends and future prospects
Market trends affecting the U.S. environmental services sector
Health care services: Strong fundamentals and innovations foreshadow growth in U.S. exports and foreign direct investment

October 1999
Outsourcing by the pharmaceutical industry provides opportunities for fine chemical producers worldwide
Thailand’s financial crisis and progress towards recovery—Implications for U.S. trade

December 1999
Air transport services: International regulation and future prospects for liberalization
Renewed services trade negotiations in the WTO

March 2000
Machine vision: Vital technology for manufacturing industries
Agriculture in the WTO: The Seattle Ministerial and beyond

July 2000
Express services: Issues for negotiation in the World Trade Organization
Production-sharing update: Developments in 1999
Apparel market: New U.S. legislation places CBERA countries on a more equal competitive basis with Mexico

October 2000
WTO agricultural trade negotiations: An update
Steel sector explores E-Commerce although wary of quick transition
Mexico’s emergence as a global automotive production center drives trade and investment

January 2001
U.S. metal mining: Recent trends and uncertainty discourage domestic exploration and investment
Factors affecting the competitive position of the Indian software industry
Manufacturing strategies of the North American major household appliance industry

March 2001
Apparel: Andean countries seek parity with Caribbean Basin countries to remain competitive in the U.S. market
Chemical trade by the Central European countries: Difficulties of sector transition
Commercialization of hybrid automobiles: Prospective demand for light metals
Listing of Published Articles—Continued

July 2001
Trends in China’s steel consumption
Production-sharing update: Developments in 2000

October 2001
E-commerce and nonferrous metals: Despite potential, adoption has been slow
Foreign direct investment in infrastructure services in OECD countries

December 2001
Evidence of trade, income, and employment effects of NAFTA
U.S. primary aluminum: Power costs and market conditions could cause long-term restructuring

March 2002
Dyeing and finishing of apparel fabrics
WTO agricultural trade negotiations: A second update
Aluminum metal matrix composites gaining greater market acceptance

July 2002
U.S. telecommunication services: Industry and trade outlook
Mexico versus China: Factors affecting export and investment competition
Production-sharing update: Developments in 2001

October 2002
International trade in commercial equipment leasing services
International telecommunication markets: Accounting rate reform

December 2002
Major contraction of the domestic refined copper industry
Power generation and transmission equipment in the Latin American market

April 2003
WTO agricultural trade negotiations: Third update recapping the Doha Ministerial
Catalysts: An innovative industry responds to technological and competitive challenges

August 2003
Global copyright protection and the challenge of digital piracy
The measurement and effects of nontariff barriers to trade in basic telecommunication services
## Global copyright protection and the challenge of digital piracy

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of copyright industries to the U.S. economy</td>
<td>1</td>
</tr>
<tr>
<td>Magnitude and effect of copyright piracy</td>
<td>2</td>
</tr>
<tr>
<td>International IPR Agreements</td>
<td>3</td>
</tr>
<tr>
<td>Early international IPR efforts</td>
<td>4</td>
</tr>
<tr>
<td>TRIPS</td>
<td>5</td>
</tr>
<tr>
<td>Digital piracy and the WIPO Internet Treaties</td>
<td>7</td>
</tr>
<tr>
<td>Outlook</td>
<td>8</td>
</tr>
</tbody>
</table>

## The measurement and effects of nontariff barriers to trade in basic telecommunication services

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Group on Basic Telecommunication Agreement</td>
<td>11</td>
</tr>
<tr>
<td>Schedules of Commitments</td>
<td>12</td>
</tr>
<tr>
<td>Additional GBT components</td>
<td>12</td>
</tr>
<tr>
<td>Literature review</td>
<td>13</td>
</tr>
<tr>
<td>Methodology</td>
<td>14</td>
</tr>
<tr>
<td>Econometric results</td>
<td>15</td>
</tr>
<tr>
<td>Quantity impacts</td>
<td>17</td>
</tr>
<tr>
<td>Conclusion</td>
<td>19</td>
</tr>
</tbody>
</table>

## Appendix A: Key performance indicators of selected industries and regions

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A: Key performance indicators of selected industries and regions</td>
<td>iv</td>
</tr>
</tbody>
</table>
Appendix A: Key performance indicators of selected industries and regions

Steel:
- Figure A-1: Operating income trends down for minmill and specialty producers during first quarter 2003
- Table A-1: Imports decrease and exports increase during first quarter 2003 compared to fourth quarter 2002, and also compared to first quarter year ago
- Table A-2: Steel service centers: Shipments increase and inventories decrease during first quarter 2003 compared to fourth quarter 2002, consistent with seasonal demand trends
- Figure A-2: Steel mill products, all grades: Capability utilization drops below 90 percent during fourth quarter 2002 but remains well above capability utilization during fourth quarter 2001

Automobiles:
- Table A-3: U.S. sales of new passenger vehicles (cars and light trucks), domestic and imported, and share of U.S. market accounted for by sales of total imports and Japanese imports, by specified periods, January 2002-June 2003
- Figure A-3: U.S. sales of new passenger vehicles (cars and light trucks) increased in the second quarter 2003; sales of domestic passenger vehicles as a percentage of total U.S. sales gain significantly compared to first quarter 2003

Unwrought Aluminum:
- Figure A-4: Despite a 24-percent increase in first quarter imports, largely supplied by Russia during March 2003, prices reached their highest quarterly average since the second quarter 2001
- Table A-4: Reduced production and rising input costs in first quarter 2003, moved aluminum prices upward to 5 cents over the 12-month low of 62.6 cents per pound in August 2002

Flat glass:
- Figure A-5: Japanese monthly average imports show increase during first 5 months of 2003

Services:
- Figure A-6: Balance on U.S. service trade accounts, by quarter, 2002 and 2003
- Figure A-7: Surpluses on cross-border U.S. services transactions with selected trading partners, by quarter, 2001-2003

North American trade:
- North American trade highlights
The U.S. International Trade Commission (USITC) is interested in your voluntary comments (burden less than 10 minutes) to help assess the value and quality of our reports, and to assist in improving future products. Please return survey by facsimile (202-205-3161) or by mail to the USITC, or visit the USITC Internet home page (http://reportweb.usitc.gov/reader_survey/readersurvey.html) to electronically submit a Web version of the survey.

(Please print; responses below not for attribution):

Your name and title: ________________________________

Organization (if applicable): ________________________________

Which format is most useful to you? [ ] CD-ROM [ ] Hardcopy [ ] USITC Internet site

Circle your assessment of each factor below: SA = strongly agree, A = agree, N = no opinion, D = disagree, or SD = strongly disagree.

Value of this report:

- Statistical data are useful .................. SA A N D SD
- Other non-numerical facts are useful ................. SA A N D SD
- Analysis augments statistical data/other facts ................ SA A N D SD
- Relevant topic(s)/subject matter ......................... SA A N D SD
- Primary or leading source of information on this subject .... SA A N D SD

Quality of this report:

- Clearly written ..................................... SA A N D SD
- Key issues are addressed ............................. SA A N D SD
- Charts and graphs aid understanding ..................... SA A N D SD
- References cite pertinent sources ....................... SA A N D SD

Other preferred source of information on this subject: ________________________________

Specify chapters, sections, or topics in report that are most useful: ________________________________

Identify any type of additional information that should have been included in report: ________________________________

Suggestions for improving report: ________________________________

Please update your mailing and electronic addresses below (voluntary):

Mailing address: ________________________________

City, state, and zip code: ________________________________

E-mail address: ________________________________
Global Copyright Protection and the Challenge of Digital Piracy

Christopher Johnson

cjohnson@usitc.gov
(202) 205-3488

Overseas infringement of intellectual property rights (IPR) has become a significant problem for the international trade and investment of U.S. industries that depend on recognition of copyrights, such as the publishing, software, and entertainment industries. The growing use of digital technology by copyright industries has increased the ease and speed with which infringers of IPR can illegally duplicate and transmit copyrighted products, thereby accelerating digital copyright piracy. This article discusses (1) the importance of copyright industries to the U.S. economy, (2) the costs incurred by these industries due to overseas copyright infringement, (3) efforts to address copyright protections in international agreements, and (4) the challenges of digital piracy. Although other means to address international copyright infringement exist, such as technical measures by industry and trade policy actions by government, this article is focused primarily on copyright protections in international agreements.

Importance of Copyright Industries to the U.S. Economy

Copyright industries are among the fastest growing in the world and are particularly important to the U.S. economy because the performance of these industries is characterized by above-average growth in output and employment and higher-than-average wages and salaries. According to a study completed in 2002, the value of output accounted for by U.S. copyright-based industries, including those producing computer software, printed materials, movies, home videos, compact discs (CDs), audiocassettes, and other media products, rose during 1977-2001, at an average annual growth rate of 7 percent, compared with 3 percent for the remainder of the U.S. economy. In 2002, those industries accounted for $535.1 billion in value added, or more than 5 percent of GDP. Meanwhile, domestic employment in copyright-based industries more than doubled between 1977 and 2001, to 4.7 million workers, representing an average annual growth rate of 5 percent, or almost 3 times the rate of growth of the U.S. economy as a whole.

U.S. exports and other overseas sales by U.S. copyright businesses amounted to almost $89 billion in 2001, an increase of more than 9 percent from the prior year. In 2000, the seven members of the U.S. motion picture industry alone earned over $12.5 billion in film, television, and home video revenues in over 154 foreign countries around the world.

1 The views expressed in this article are the author’s. They are not the views of the U.S. International Trade Commission (USITC) as a whole or of any individual Commissioner.


3 Ibid.

Magnitude and Effect of Copyright Piracy

Because of the importance of copyright industries to the strength of the U.S. economy, mounting revenue losses due to IPR infringement are of concern to U.S. industry and government officials. In its recent report to the United States Trade Representative (USTR), the International Intellectual Property Alliance (IIPA) estimated U.S. losses in 2002, due to copyright piracy in 56 selected foreign countries for 5 copyright-based industries, to be $9.2 billion (table 1). Although U.S. copyright holders continue to be subjected to IPR piracy carried out in the United States, the enactment of more stringent U.S. copyright legislation and stiffer enforcement in recent years have reduced the rate of such piracy significantly vis-à-vis the infringement of U.S. copyright industries in many overseas markets.

Table 1
Estimated 2002 U.S. sales losses due to copyright piracy in 56 selected countries

<table>
<thead>
<tr>
<th>U.S. Industry</th>
<th>Estimated losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion pictures</td>
<td>1,322.3</td>
</tr>
<tr>
<td>Sound recordings</td>
<td>2,142.3</td>
</tr>
<tr>
<td>Business software applications</td>
<td>3,539.0</td>
</tr>
<tr>
<td>Entertainment software</td>
<td>1,690.1</td>
</tr>
<tr>
<td>Books</td>
<td>514.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,208.2</strong></td>
</tr>
</tbody>
</table>

Copyright piracy particularly affects business and entertainment software. The Business Software Alliance (BSA) reports that losses due to Internet and other digital piracy (including the unauthorized replication of optical discs such as CDs and digital video discs (DVDs))\(^{10}\) have been rising rapidly in recent years and are believed to contribute to an increasing percentage of overall foreign piracy losses.\(^{11}\) BSA has pointed out that more than one-third of the shipment value of all personal computer software (representing about $35 billion) was pirated in 1999, and it estimates that by 2008, foreign software piracy will cost the U.S. economy 175,000 jobs, $4.5 billion in wages, and nearly $1 billion in tax revenues annually.\(^{12}\)

Meanwhile, according to U.S. music industry representatives and analysts, unauthorized downloading and file-sharing on the Internet were responsible for a significant portion of the more than $2 billion in global music revenue losses incurred by the industry in 2002.\(^ {13}\) Further, although the major portion of the motion picture industry losses in that year were due to illegal copying of CDs, DVDs, and other digital forms, in a process known as “ripping and burning,” the industry is concerned that as online broadband services rapidly increase, as expected over the next several years, there could be a sharp increase in lost movie revenues due to Internet piracy.\(^ {14}\)

## International IPR Agreements

In recognition of the importance of copyright industries to the U.S. economy and concerns regarding both domestic and overseas piracy, the United States has signed a number of international agreements related to copyright protection (table 2), including international conventions and treaties that are now administered under the auspices of the World Intellectual Property Organization (WIPO).\(^ {15}\) In addition, in 1995 the United States became a party to the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs),\(^ {16}\) the first multilateral intellectual property agreement with a strong dispute-resolution mechanism enforceable between governments. These agreements have enabled the United States to make significant progress in addressing overseas copyright piracy, and have led to higher minimum standards of protection in the United States and other nations. However, none of these agreements specifically addressed digital piracy. As a result, the United States and a number of other countries signed two newly created international agreements in 1996 (which entered into force in 2002), popularly known as the WIPO Internet Treaties,\(^ {17}\) which clarified that copyright is applicable in the digital environment.

---

\(^{10}\) Also known as digital versatile discs.


\(^{14}\) One business journal estimates that within several years, 50 percent of Internet users will have broadband, “making it easier to pass programs captured in digital form around on the Net.” Grover and Green, “Hollywood Heist,” pp. 74-82.

\(^{15}\) See more detailed discussions of WIPO in following sections.

\(^{16}\) See discussion of agreement later in this section.

\(^{17}\) For further details on the WIPO Internet Treaties, see the box that follows a more detailed discussion of the treaties later in this article. Additional information on the treaties may be found on WIPO’s Internet site located at [http://www.wipo.org](http://www.wipo.org).
Table 2
Major international copyright conventions

<table>
<thead>
<tr>
<th>Agreement (Year)</th>
<th>Number of signatories</th>
<th>Goals</th>
<th>Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berne Convention (1886, revised in 1971)</td>
<td>111</td>
<td>Basic copyright treaty based on principles of non-discrimination and national treatment.</td>
<td>World Intellectual Property Organization</td>
</tr>
<tr>
<td>Universal Copyright Convention (1952)</td>
<td>57</td>
<td>Copyright treaty accommodating U.S. statutory requirements and based on principles of non-discrimination and national treatment.</td>
<td>United Nations Educational, Scientific, and Cultural Organization</td>
</tr>
<tr>
<td>Geneva Convention (1971)</td>
<td>52</td>
<td>Protection of producers of phonograms against the making of duplicates in another country.</td>
<td>World Intellectual Property Organization</td>
</tr>
</tbody>
</table>


**Early International IPR Efforts**

The increase in the flow of creative ideas among more advanced countries at the end of the late 19\textsuperscript{th} century spurred international cooperation with respect to copyright protection.\textsuperscript{18} Several European countries established the first major agreement, the Berne Convention, to address intellectual property protection internationally (see table 2). Other international copyright-related conventions that followed in the mid-20th century included the Universal Copyright Convention, the Rome Convention, and the Geneva Convention. The United States and most of its major trading partners are now signatories to each of the above conventions.

In 1967, WIPO was created to administer most of the international IPR-related treaties.\textsuperscript{19} The major accomplishment of the WIPO-administered copyright conventions was the requirement that signatory countries provide both national treatment and most-favored-nation status for foreign countries, enabling creators an opportunity to apply for copyright and related protection in other member countries on the same terms as other domestic and foreign creators.

Some believe that WIPO and the international copyright regimes it oversees, although valuable in establishing international cooperation in the protection of copyrighted products, were developed with “loose rules, weak dispute settlement mechanisms, and [little] ability to enforce the provisions of international treaties.”\textsuperscript{20} For instance, despite the obligations placed on member countries by the Berne Convention and


\textsuperscript{19} In 1967, a diplomatic conference among 51 mostly industrialized countries established WIPO to administer the Berne and Rome Conventions, as well as a number of other international treaties related to areas of IPR such as patents, trademarks, appellations of origin, etc. Some of these other treaties administered by WIPO include the Paris Agreement on Industrial Property (1883), the Madrid Agreement (1890), the Lisbon Agreement (1958), and the Treaty on Intellectual Property in Respect of Integrated Circuits (1989). WIPO joined the United Nations System in 1974. For further information on WIPO, see WIPO’s Internet site located at http://www.wipo.int/about-wipo/en.

the other international copyright treaties, the lack of provisions requiring minimum standards of protection hindered the ability of the WIPO system to enforce strong copyright protection.²¹

Another reported weakness of the WIPO system was that not all countries were members of WIPO or signatories to each of the individual agreements it oversees, particularly the rapidly emerging markets in Asia that were increasingly being targeted for exports and investments by U.S. firms.²² More importantly, it could not guarantee protection to copyrighted products or services at or near the same level as they received in the United States.

**TRIPs**

Intellectual property protection became an increasingly important international trade policy issue for the United States in the 1970s and 1980s as copyright (and other IPR-dependent) industries and foreign trade became more important components of the U.S. economy (figure 1). At the time, the most authoritative international trade forum for the industrialized countries, the General Agreement on Tariffs and Trade (GATT), had not yet adequately addressed protection of IPR in general, let alone copyright protection. Thus, WIPO and the conventions it oversees were the primary international agreements available to the United States to deal with inadequate copyright protection overseas.

![Figure 1](image.png)

**Figure 1**

U.S. trade as a percentage of gross domestic product (GDP), and number of U.S. copyright registrations, 1960-2000

The United States and other large trading partners, including the European Union and Japan, sought to have copyright and other IPR issues addressed during the GATT Uruguay Round of trade negotiations. An agreement was negotiated, to be administered by the newly established WTO, namely the TRIPs agreement. TRIPs covers copyrights (and related rights of performers; broadcasters; and producers of records, compact discs, and videos), as well as trademarks, patents, layout-designs of integrated circuits, geographic indications, industrial designs, and trade secrets.

The major achievement of TRIPs for copyright industries is that it sets relatively high minimum standards for the enforcement of copyrights for all WTO members “through civil actions for infringement and, at least in regard to copyright piracy, . . . in criminal actions and actions at the border.” In addition, TRIPs is the first multilateral intellectual property agreement with a robust dispute resolution mechanism that is enforceable between governments. According to U.S. industry representatives, the accomplishments of TRIPs cannot be understated since most of the 144 WTO members, including a number of developing countries, are currently obligated by the agreement with respect to copyrights.

Although TRIPs overcame many of the limitations of the previous international intellectual property agreements, it is built around the main international conventions administered by WIPO. For instance, with respect to copyrights, WTO members are required to comply with the provisions of the Berne Convention for copyright protection. Further, as in U.S. law, computer software is to be protected as a literary work under the Berne Convention and the conditions under which databases are to be protected by copyright are clearly specified.

The WTO has several standards to objectively assess the TRIPs enforcement obligations for copyrighted products. Among these are standards that require members to provide “adequate” procedures, “effective” remedies that “constitute a deterrent to further infringements,” and procedures that are not “unreasonably costly” or that cause “unreasonable delays.” Specific remedies that must be available include the authority of courts to stop infringing imports (injunctive relief), damages “adequate to compensate for the injury the right holder has suffered,” and preventive remedies, including possible seizure, forfeiture, and destruction of infringing goods, when such infringement is done with criminal intent. Most importantly, criminal remedies must be available for copyright piracy occurring on a commercial scale.

23 The Uruguay Round Trade Agreements entered into force on Jan. 1, 1995, creating the WTO. See the WTO Internet site located at http://www.wto.org.
25 It should be noted, however, that the regional North American Free-Trade Agreement (NAFTA), among the United States, Canada, and Mexico, which had preceded by a year the conclusion of the Uruguay Round Agreements establishing the WTO, was the first trade agreement to establish mutual obligations on its members to provide minimum standards of IPR protection and enforcement, including civil and criminal penalties in certain instances. Generally, the NAFTA provisions are very similar to the TRIPs provisions, and in some instances exceed the TRIPs requirements.
26 U.S. industry representatives, telephone and written communications with USITC staff, Jan. 2003.
27 Copyright obligations are based on the Berne Convention for the Protection of Literary and Artistic Works (1971) and the Rome Convention (1961). Computer programs, databases, sound recordings, movies, and performances are protected for 50 years. Broadcasts receive 20 years of protection. Rental rights (the rights to authorize or prohibit commercial renting) are provided for performers, producers, and broadcasting companies.
Digital Piracy and the WIPO Internet Treaties

TRIPs was finalized prior to consideration of digital piracy, the area currently of greatest concern to the copyright industries. Digital piracy takes two primary forms. The first is the replication and distribution of illegal copies of tangible media, most frequently of the optical disc variety (CDs and DVDs). Also included in this category is the unauthorized use of the content on discs across multiple users. This problem occurs around the world (including in the United States) with varying degrees of severity. The second form of digital piracy is the transmission of copyright-protected data over the Internet, as information can just as easily be sent across the world as it can be sent across the country. In both cases, digital piracy is an international problem.

The digital world facilitates generation of perfect copies quickly and efficiently, at negligible cost. Companies naturally have taken advantage of these characteristics to distribute their content easily (at low cost) and in a format that consumers value. Yet, the very qualities that make the digital format so attractive to the copyright industry also have the potential for illicit use. Thus, almost anyone with the incentive to do so can become an illegal distributor.

In response to growing concerns over digital piracy, the United States and a number of other countries signed the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT) in 1996, often referred to as the “Internet Treaties” (box 1). Both treaties require member countries to provide a basic framework of rights, allowing creators to control and be compensated for the many ways in which their creative content can be used by others in digital networks. The United States implemented the WIPO treaties by adopting the Digital Millennium Copyright Act of 1998 (DMCA).

28 There are other possible forms of digital piracy in addition to those discussed here. However, they are less common and therefore do not receive full attention in this article. For more in-depth discussions concerning digital piracy, see National Academy of Sciences (NAS), The Digital Dilemma, Intellectual Property in the Information Age (Washington, DC: National Academy Press, 2000); and Internet sites of IIPA, BSA, MPAA, and RIAA, located at http://www.iipa.org, http://www.bsa.org, http://www.mpaa.org, and http://www.riaa.org, respectively.

29 This concept is discussed in more detail in NAS, The Digital Dilemma, 2000.

30 The DMCA provides new standards for the protection of copyrights in the digital realm. Among other provisions, the DMCA makes it illegal to circumvent antipiracy measures built into works, including most commercial software, music, and other content on CDs and DVDs. It outlaws the act of circumvention of controls used to prevent unauthorized access to works, and the act as well as the production, sale, or distribution of code-breaking devices used to illegally copy or make other copyright use of protected works. Under the DMCA, service providers are expected to remove material from users’ web sites that they know, are made aware, or should know constitute copyright infringement. Further, the legislation requires that “webcasters” pay licensing fees to record companies. For violators, the DMCA provides for civil, administrative, and criminal remedies. Chris Gibson, WIPO Internet Copyright Treaties Coming Into Force (London: Steptoe & Johnson, 2002), pp. 1-4; Library of Congress, “Rulemaking on Exemptions from the Prohibition on Circumvention of Technological Measures that Control Access to Copyrighted Works,” Apr. 30, 2002, pp. 1-3, found at http://www.loc.gov, retrieved Apr. 22, 2003; and UCLA Online Institute for Cyberspace Law and Policy, “The Digital Millennium Copyright Act,” Feb. 8, 2001, pp. 1-2, found at http://www.gseis.ucla.edu, retrieved July 27, 2002.
Outlook

According to U.S. industry representatives, the growth of digital technology (optical discs and the Internet) has brought new opportunities and challenges for the copyright industries, whose products will increasingly be globally traded using these new forms of media and distribution. 31 However, they state that unless the Internet is safeguarded from the proliferation of IPR piracy, “the medium will never reach its full potential to contribute to global economic growth and culture.” 32

Thus far, only 30 countries, or less than one-fourth of the members of the WTO, have signed the WIPO Internet Treaties, and many of those have not yet converted the treaty provisions into law by passing implementing domestic legislation, as the United States has done. 33 U.S. industry representatives state that if countries delay the implementation of these changes, the adverse impact on the protection of copyrighted

---

33 This article primarily focuses on the impact of overseas copyright infringement on U.S. trade, international trade agreements, and U.S. trade strategies to address overseas piracy. For more detailed information on problems of domestic piracy and protection of copyright under U.S. copyright law, see the footnote above on the Digital Millennium Copyright Act; and Johnson and Walworth, Protecting U.S. Intellectual Property Rights and the Challenges of Digital Piracy, pp. 10-12.
material on the Internet could be irreversible and, in turn, slow the growth of electronic commerce. Consequently, the domestic copyright industry has called on the U.S. Government to assist it in securing full implementation of the new WIPO Internet Treaties by all countries.

In response, the USTR has made ratification and implementation of the WCT and WPPT a key element of its unilateral, bilateral, and multilateral trade strategies with respect to IPR. For instance, during the past several years, the United States has used its Special 301 unilateral process for addressing inadequate IPR protection by foreign trading partners to persuade countries that have not yet signed the WIPO Internet Treaties to do so; and those who have done so, to expeditiously implement the provisions in their domestic laws and regulations. The U.S. copyright industry has also taken advantage of recent bilateral free trade agreements (FTAs) signed by the United States with Singapore and Chile to incorporate key elements of the WIPO Internet Treaties in the IPR chapters of the agreements. The principal U.S. trade advisory committee representing IPR interests strongly supports the IPR provisions of these FTAs, including their references to the WIPO treaties, on the grounds that they establish precedents to be included in future FTAs, “which can raise the level of protection and enforcement globally.”

---

36 Under provisions of Special 301, USTR issues an annual report to identify countries that deny adequate and effective protection of IPR, or deny fair and equitable market access to U.S. persons or firms that rely on intellectual property protection. Countries with laws, policies, or practices that have the greatest adverse effects on relevant U.S. producers or products must be designated as priority foreign countries unless USTR finds that the countries are entering into good faith negotiations or are making significant progress in bilateral or multilateral negotiations to provide adequate and effective IPR protection. Priority foreign countries are subject to investigation and, if necessary, trade sanctions or other actions by USTR under Section 301 provisions. For more information on unilateral actions taken by the United States to address overseas piracy, see the discussions on Section 301 and Special 301 in USTR, 2003 Trade Policy Agenda and 2002 Annual Report, Mar. 2003, pp. 233-239; and Johnson and Walworth, Protecting U.S. Intellectual Property Rights and the Challenges of Digital Piracy, pp. 16-20.
The Measurement and Effects of Nontariff Barriers to Trade in Basic Telecommunication Services

Richard Brown\textsuperscript{1} Robert Feinburg\textsuperscript{1}
rbrown@usitc.gov rfeinburg@usitc.gov
(202) 205-3438 (202) 205-2602

Using econometric methods, this analysis develops quantity impacts of impediments to trade in voice telephone services.\textsuperscript{2} Quantity impacts are estimates of the difference between trade volumes in the presence of nontariff barriers (NTBs) and trade volumes in the absence of such barriers. These impacts, estimated on the basis of market, demographic, and policy variables, establish a baseline from which the achievements of future trade rounds, including the Doha Round, could be compared. In a departure from previous literature in this area, this article draws on documents appended or pertaining to the General Agreement on Trade in Services (GATS) to identify NTBs to trade in basic telecommunication services, and to estimate quantity impacts on this basis. Although previous literature has avoided the use of GATS schedules to develop policy variables for reasons that are discussed in the article, it is the GATS schedules and associated documents that will, in the end, reveal the extent of liberalization achieved by negotiation.

The article finds that market access and national treatment commitments scheduled by the World Trade Organization (WTO) members under the GATS, when complemented by commitments to pro-competitive regulatory principles and strict adherence to scheduling guidelines, may be formulated into meaningful policy variables. The model specification described in the article explains 84 to 85 percent of variation in market penetration, measured in mainlines per hundred persons. Further, policy variables derived from GATS commitments are found to be statistically significant, as are variables for income and private sector ownership.

The measurement of nontariff barriers to trade in services, and the gains associated with removing such barriers, has been of keen interest for the past several years. This is due in part to the ongoing Doha Round negotiations in the WTO, where services liberalization is part of the built-in agenda, and in part to growing recognition of the prominence of the service sector in overall economic activity. The following facts justify such interest:

- The service sector typically accounts for between 60 percent and 80 percent of gross domestic product (GDP) in developed and developing countries alike, and represents approximately the same share of private sector employment.

---

\textsuperscript{1} The views expressed in this article are the authors'. They are not the views of the USITC as a whole or any individual Commissioner.

\textsuperscript{2} Voice telephone services have been selected because nontariff barriers tend to be heaviest in this subsector, likely because these services are readily identified as a public good by business and residential users and because they are a major source of telecommunications revenue.
• Infrastructure services industries, including telecommunications, finance, energy, and transportation, exert an economy-wide influence as they constitute inputs to all other economic activities and facilitate trade. The efficiency with which these services are provided influences the global competitive posture of all firms availed of their services.

• Global service exports measured $1.5 trillion in 2001,\(^3\) representing 19 percent of global cross-border trade flows.\(^4\)

• During 1980-2001, cross-border exports of commercial services increased at an average annual rate of 7.2 percent, while exports of merchandise increased by 5.7 percent.\(^5\)

• Sales of services through overseas affiliates have exceeded cross-border exports by a widening margin since 1996.\(^6\) In 2000, foreign affiliates of U.S. parent firms sold services valued at $393 billion, 40 percent greater than cross-border exports of $278 billion.\(^7\)

This article estimates the impact of nontariff barriers to international trade in voice telephone services. In a departure from previous work in the area, the article presents policy variables derived from commitments to market access, national treatment, and pro-competitive regulatory principles appended to the General Agreement on Trade in Services (GATS), rather than formulating policy variables based on alternative information sources. GATS commitments have been chosen in the interest of establishing a measure of trade liberalization achieved through negotiation.

The Group on Basic Telecommunications (GBT) Agreement\(^8\)

\textit{Schedules of Commitments}

Supplemental schedules of specific commitments for basic telecommunication services were appended to the GATS on February 8, 1998, with the adoption of the Fourth Protocol to the GATS.\(^9\) The supplemental schedules, along with initial GATS schedules that entered into force on January 1, 1995, contain much of the detail of the GBT Agreement.\(^10\)

---


\(^{6}\) As of May 2003, the United States is the only country that tracks and publishes data on services sold through affiliates. Julian Arkell, \textit{STATS ON FATS: Statistics on Foreign Affiliate Trade in Services - The New International Statistical Standard} (Chevy Chase, MD: Mark Twain Institute, 2002), p. 17.


\(^{8}\) GBT was formed in Apr. 1996 to continue negotiations after the agreement reached by its predecessor, The Negotiating Group on Basic Telecommunications (NGBT), was deemed insufficient by the United States.


\(^{10}\) It is important to take the initial schedules into account because important horizontal (i.e., cross-sectoral) limitations on foreign investment and temporary entry and stay (of services personnel) are found there. Horizontal commitments must be read together with sector-specific commitments to identify potential business opportunities and pertinent restrictions.
In the supplemental telecommunication schedules, one finds market access, national treatment, and additional commitments pertaining to seven basic telecommunication service sectors: voice telephone services, packet-switched data transmission services, circuit-switched data transmission services, telex services, telegraph services, facsimile services, and private leased circuit services. Member countries schedule commitments by sector and mode of supply (i.e., cross-border supply, consumption abroad, commercial presence, and movement of natural persons). Due to the positive listing methodology employed in the GATS, member countries can schedule commitments to all, none, or a combination of basic telecommunication sectors. Commitments are of two types. Full commitments (also called bindings) indicate that there are no limitations on foreign participation in terms of market entry or regulatory treatment. Partial commitments indicate that limitations exist, and briefly summarize the nature of the limitation.

Others who have endeavored to measure NTBs in services have tended to formulate policy variables by drawing on information sources other than the GATS schedules. One explanation for this is the difference in research objectives. Other research has tended to focus on trade liberalization, however it is achieved. This article focuses on liberalization achieved through negotiations. In service negotiations, liberalization is achieved when countries agree to bind newly liberalized practices or trade liberalizing practices planned for the future.

A second reason why other researchers have not formulated policy variables by drawing on GATS schedules is that these schedules have information gaps that hinder efforts to measure the effect of NTBs. One important gap is that GATS commitments do not address some issues that strongly influence the competitive environment, thereby calling into question whether commitments guarantee effective market access. The following section indicates the manner in which the GBT Agreement fills these gaps. Another difficulty with the GATS is that, where no commitment has been scheduled, it remains unclear whether or not a trade impediment exists. Unbound limitations are identified by the absence of an entry for the sector of interest (voice telecommunication services in this instance) or by the word “unbound.” No information on regulatory policy, whether liberal or not, is provided in the schedules. The GBT Agreement does not address this shortcoming.

### Additional GBT Components

Telecommunication schedules are complemented by two additional documents that fill information gaps typically found in schedules: a note circulated by the GBT Chairman, and the regulatory reference paper. In combination, these documents assist firms in identifying regulations or practices that may enhance the value of market access and national treatment commitments. The note issued by the GBT Chairman on January 16, 1997, provides useful guidance on scheduling and interpreting basic telecommunication commitments, though it lacks legal status. The note stipulates that market access and national treatment commitments on basic telecommunication services, unless otherwise stated in the schedules, encompass local, long-distance, and international services; for public and non-public use; on a facilities and resale basis; through any means of technology (e.g., cable, cellular, and satellite). With these stipulations, the note ensures that commitments are scheduled in a manner that accurately reflects regulatory rules and practices, among which there is broad diversity across countries. For instance, the U.S. telecommunications regime draws important

---

11 National treatment usually accords to foreign firms the same rights and obligations accorded to domestic firms.
12 A commitment to market access or national treatment is also referred to as a binding.
13 WTO, Note by the Chairman - Revision, S/GBT/W/2/Rev. 1, Jan. 16, 1997.
distinctions between local and long-distance service providers, assigning different rights and obligations to each, whereas in Japan, key distinctions are drawn between facilities-based service providers and resellers. By virtue of the note, basic telecommunication service commitments were rendered more transparent and practical in terms of identifying business opportunities.

The reference paper is considered by many observers as one of the major achievements of the GBT Agreement, and perhaps of the entire Uruguay Round of services negotiations. The reference paper was intended to safeguard the value of market access commitments by seeking to render specific regulatory practices competitively neutral. In this sense, the reference paper effectively addresses the intent of Article VI(4) of the GATS framework, which pertains to domestic regulation. Article VI(4) requires that technical standards and licensing requirements not constitute unnecessary barriers to trade in services and that pertaining disciplines are (1) based on objective and transparent criteria, such as competence and the ability to supply the service; (2) not more burdensome than necessary to ensure the quality of the service; and (3) in the case of licensing procedures, not in themselves a restriction on the supply of the service. The reference paper embodies these broad principles, but makes them specific to basic telecommunication services. Countries could bind to all or part of the reference paper. In binding to the entire reference paper, countries committed to:

- prevent anti-competitive practices, including cross-subsidization among other practices;
- provide interconnection on a timely basis, and upon request, under nondiscriminatory terms, conditions, and quality, with cost-oriented rates that are transparent, reasonable, and sufficiently unbundled (so that competing suppliers need not pay for services or facilities they do not require);
- assure that universal service obligations are administered in a transparent, nondiscriminatory, and competitively neutral manner;
- assure public availability of licensing criteria, with timely notification of the terms and conditions of licensing and reasons for the denial of licenses upon request;
- maintain or create independent and impartial regulators not accountable to any supplier of basic telecommunication services; and
- allocate scarce resources, including frequencies, numbers, and rights of way, in an objective, timely, transparent, and nondiscriminatory manner.

**Literature Review**

Efforts to measure NTBs on services are relatively new, with most work dated after completion of the Uruguay Round. Marko (1998), among the first to approach the GBT Agreement in a quantitative fashion, computes frequency measures for 69 GBT signatories based on GATS market access and national treatment commitments for all four modes of supply. Marko uses two methods to compute the measures, first by considering only full commitments, and second by constructing a five-point weighting system to assess partial commitments scheduled by member countries. Marko estimates that 45 percent of the basic

---

15 Bindings to the principles set forth in the reference paper could take effect upon the GBT Agreement’s entry into force, or at a later date specified by the member country.
telecommunication services markets represented by GBT signatories is open to free trade, reflecting how much remains to be done despite the GBT Agreement.\textsuperscript{16}

Warren (2000) takes the quantitative approach further, performing regression analysis on market (income per capita, service quality, and unmet demand), demographic (housing density), and policy variables of his own construction in an attempt to explain market penetration, measured as mainlines\textsuperscript{17} per 100 persons, in 136 countries. Warren constructs four policy variables associated with market access (MA) and national treatment (NT) mostly from data provided by the International Telecommunication Union. The variable MA/Trade captures policies that impede market access of \textit{all potential entrants (domestic and foreign)} by restricting provision of cross-border telecommunication services; MA/Invest, policies that discriminate against \textit{all potential entrants (domestic and foreign)} seeking to supply services through partially or wholly owned foreign affiliates; NT/Trade, policies that impede market access of \textit{potential foreign entrants} by restricting provision of cross-border services; and NT/Invest, policies that discriminate against \textit{potential foreign entrants} seeking to supply services through foreign-invested affiliates. In regressions performed by Warren, he reports that the latter 3 policy variables appear to be statistically significant, along with income per capita, unmet demand, and service quality, and that these variables jointly explain 88 to 89 percent of variation in market penetration.\textsuperscript{18}

**Methodology**

This analysis uses ordinary least squares (OLS) to estimate the relationship between market penetration in the year 2000,\textsuperscript{19} measured by mainlines per hundred persons,\textsuperscript{20} and selected market, demographic, and policy variables in 67 countries. Although market penetration does not measure the quantity of basic telecommunication services consumed, it does measure the capacity over which consumption, including inbound and outbound international calls, could take place. Further, low market penetration tends to be associated with state-owned and -operated telecommunication monopolies. In fact, it is low market penetration that has motivated many countries to open their markets to foreign investment in the expectation, or under the requirement, that better capitalized carriers would increase market penetration rates. National calling minutes or international calling minutes may be superior variables for measuring quantity, but data are not available for many of the 67 countries of interest here.

In explaining market penetration, we estimate a reduced-form of supply and demand factors. On the demand side, we anticipate that telephone service is a normal good, so that income should have a positive impact on market penetration. On the supply side, increased population density may be a proxy for reduced cost per household of establishing telecommunication networks (so we would expect a positive impact on market penetration). Also supply-related, the role of the private sector in the telecommunications industry would be expected to be cost-reducing, leading to a positive impact on penetration although, as noted below,


\textsuperscript{17} A mainline is a telephone line connecting a subscriber’s terminal equipment to the public switched network and which has a dedicated port in the telephone exchange equipment.


\textsuperscript{19} Market penetration data for the year 2000 were used to allow time for commitments that became binding in 1998 to exert influence over telecommunication service markets.

\textsuperscript{20} One issue that is not formally addressed is the relationship between fixed and mobile telecommunications usage. While the focus here is on fixed mainline penetration, some preliminary work suggests that similar results may hold for mobile phone penetration.
the link may be more complicated than this, especially in developing economies. Similarly, market reform -
deﬁned as the passage of telecommunication reform legislation and establishment of an independent regulator -
should increase market penetration. Finally, the policy measures which are the focus of this article are
intended to increase penetration, though it is an empirical question as to their impact.

We deﬁne the independent variables as follows:

• LOG(Y), the natural log of GDP per capita in 1998, resulting in a semi-log specification;21

• PS, the share of the incumbent telecommunications carrier held by the private sector in each
country as of 1998;

• PSOECD, the share of the incumbent telecommunications carrier held by the private sector in
OECD countries in 1998 (set to zero for non-OECD ﬁrms);

• PD, for population density in 1998;

• REFORM, a dummy variable that equals 1 if a country had undertaken telecommunication
market reform by 1998, and 0 otherwise; and

• policy variables GATSPOLICY, MAPOLICY, and NTPOLICY, explained below.

The three policy variables are highly correlated and therefore their effects are examined via three
separate specifications. GATSPOLICY is a composite policy variable that reﬂects a scoring of market
access and national treatment commitments (taking values from 0 to 1); the scope of commitments, referring
to the share of basic telecommunication sub-sectors bound (taking values from 0 to 1);22 reference paper
bindings, referring to the share of reference paper principles bound (taking values from 0 to 1); and the depth
of commitments, referring to the extent to which all commitments scheduled applied to local, long-distance,
and international services over public and non-public works; wireline, cellular, and satellite networks; and
resale and facilities-based networks23 (taking values from 0 to 1). Market access and national treatment
commitments are scored by the degree to which they promote or impede trade, as suggested by an OECD
document published in 2001.24 For each of the four modes of supply, this document usefully separates the
types of NTBs commonly found in schedules into three categories: those having little or no restrictive effect,
 accorded a score of 0.75; restrictive effect, accorded a score of 0.5; and prohibitive or highly restrictive
effect, accorded a score of 0.25. To extend this scoring system, entries in the schedules that are unbound
(signifying no binding) are accorded a score of 0.0,25 and full commitments (signifying the absence of
limitations) are accorded a score of 1.0.

21 The natural log of Y was selected because a scatter diagram of the data suggested that mainlines per hundred
increased at a decreasing rate as income increased.
22 The scope of basic telecommunication services bound by countries enters into the equation because it is more
economical to provide telecommunication services in a market if a variety of services can be provided over new or
acquired network capacity. Like the GBT Chairman’s note and the reference paper, the scope of commitments affects
the value of market access commitments.
23 If all 4 elements of the GBT Chairman’s note were satisﬁed for all commitments, the country received a score of
1; if 3, then a score of 0.75; if 2, then a score of 0.5; if 1, then a score of 0.25; and if none, then a score of 0.
24 OECD, Working Party of the Trade Committee, “Assessing Barriers to Trade in Services: Revised Consolidated
25 The absence of a commitment does not necessarily indicate the presence of a NTB, but the absence does
reduce the legal certainty and transparency ideally provided by schedules, and permits the implementation of higher
barriers without penalty.
Proceeding through signatories’ schedules of commitments, scores are assigned to market access and national treatment commitments on voice telephone services for each of the four modes of supply, resulting in 8 scores ranging from 0 to 1. These scores are summed, and then multiplied\(^{26}\) by the product of the scores for scope, reference paper principles, and depth, resulting in a final score that ranges from 0 to 8 for the variable GATSPOLICY. Mathematically, GATSPOLICY is equal to:

\[
\text{GATSPOLICY} = (\text{CBMA} + \text{CBNT} + \text{CAM} + \text{CPMA} + \text{CBNT} + \text{MPMA} + \text{MPNT}) \times \text{Scope} \times \text{Depth} \times \text{Reference Paper},
\]

where:

- \(\text{CBMA}\) = score for commitment on cross-border market access (taking values of 0 to 1);
- \(\text{CBNT}\) = score for commitment on cross-border national treatment (0 to 1);
- \(\text{CAM}\) = score for commitment on consumption abroad market access (0 to 1);
- \(\text{CANT}\) = score for commitment on consumption abroad national treatment (0 to 1);
- \(\text{CPMA}\) = score for commitment on commercial presence market access (0 to 1);
- \(\text{CPNT}\) = score for commitment on commercial presence national treatment (0 to 1);
- \(\text{MPMA}\) = score for commitment on movement of persons market access (0 to 1);
- \(\text{MPNT}\) = score for commitment on movement of persons national treatment (0 to 1);
- \(\text{Scope}\) = score for scope of basic telecommunication services bound in schedule (0 to 1);
- \(\text{Depth}\) = score for extent of adherence to Chairman’s note (0 to 1); and
- \(\text{Reference Paper}\) = score for extent of adherence to the reference paper (0 to 1).

The variables MAPOLICY, which reflects only market access commitments for the four modes of supply, and NTPOLICY, which reflects only the national treatment commitments, are calculated in the same manner. For these variables, final scores range from 0 to 4.

**Econometric Results**

Specifications 1 through 4 (table 1) appear to explain 84 to 85 percent of variation in market penetration, and GDP per capita (\(Y\)), private ownership (\(PS\) and \(PSOECD\)), GATSPOLICY, and MAPOLICY have statistically significant coefficients. Among these specifications, the second yields the strongest result among the policy variables. In this specification, GDP per capita, which explains most of the variation in network penetration, is statistically significant at the 1-percent level, and indicates that if GDP per capita increased by 1 percent, then market penetration would increase by 0.11 mainlines per hundred. Estimated coefficients for private ownership of incumbent telecommunication carriers suggest that such holdings affect lesser developed countries and developed countries differently. Looking across all 67 countries in the sample, the coefficient of \(PS\), which is statistically significant at the 1-percent level, indicates that an increase in private sector ownership of 1 percentage point would reduce market penetration by 0.12 mainlines per hundred. Perhaps the best explanation of this is that, once private investors begin to exercise some operational control, they are apt to require that additions to basic telecommunication infrastructure generate returns that justify construction expenditures. This could reduce mainlines per hundred, at least initially. Alternative explanations are that private participation in many developed and developing countries’ basic telecommunication markets has only recently been permitted, and so the benefits of private participation have not yet taken hold, or that the coefficient is simply picking up lower pre-existing penetration rates that are sometimes associated with past government-owned and -operated incumbents.

\(^{26}\) It has been noted that multiplication of the scores is relatively rigid in that a score of zero for any one of the elements comprising the policy variable, namely those reflecting the extent of adherence to the GBT Chairman’s note and the reference paper, results in an overall policy score of zero. In recognition of this, regressions were performed using policy variables that were formulated by adding scores for commitments, scope, the extent of adherence to the GBT Chairman’s note, and the extent of adherence to the reference paper. Little or no change in goodness-of-fit (adjusted R-squared) or statistical significance resulted.
Table 1
Econometric results estimated on the basis of the specified market, demographic, and policy variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Specification 1</th>
<th>Specification 2</th>
<th>Specification 3</th>
<th>Specification 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATSPOLICY</td>
<td>1.16* (1.45)</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>MAPOLICY</td>
<td>()</td>
<td>2.80** (1.75)</td>
<td>()</td>
<td>3.03* (1.71)</td>
</tr>
<tr>
<td>NTPOLICY</td>
<td>()</td>
<td>()</td>
<td>1.42 (1.14)</td>
<td>-0.26 (0.19)</td>
</tr>
<tr>
<td>Log(Y)</td>
<td>11.61*** (6.81)</td>
<td>11.27*** (6.56)</td>
<td>12.13*** (7.75)</td>
<td>11.27*** (6.54)</td>
</tr>
<tr>
<td>PS</td>
<td>-0.12*** (-3.98)</td>
<td>-0.12*** (-4.00)</td>
<td>-0.12*** (-3.90)</td>
<td>-0.12*** (-3.90)</td>
</tr>
<tr>
<td>PSOECD</td>
<td>0.18*** (3.76)</td>
<td>0.18*** (3.73)</td>
<td>0.19*** (3.85)</td>
<td>0.18*** (3.73)</td>
</tr>
<tr>
<td>PD</td>
<td>0.00 (1.26)</td>
<td>0.00* (1.39)</td>
<td>0.00 (1.07)</td>
<td>0.00* (1.33)</td>
</tr>
<tr>
<td>REFORM</td>
<td>-1.33 (-0.65)</td>
<td>-1.85 (-0.89)</td>
<td>-0.94 (-0.45)</td>
<td>-1.92 (-0.91)</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.84</td>
<td>0.85</td>
<td>0.84</td>
<td>0.84</td>
</tr>
</tbody>
</table>

¹ Not applicable.

Note: T-statistics are in parentheses. Significance levels are determined by a one-sided t-test after correction for heteroskedasticity. The following indicates the level of statistical significance found for each independent variable:

* = The estimated coefficient has a 10 percent level of significance
** = The estimated coefficient has a 5 percent level of significance.
*** = The estimated coefficient has a 1 percent level of significance.

Source: Compiled by the U.S. International Trade Commission.

In OECD countries, estimated coefficients suggest that private participation increases market penetration, with a 1-percentage point increase in private holdings driving network penetration up by 0.18 mainlines per hundred. This effect, which is also statistically significant at the 1-percent level, may reflect longer standing private participation in these markets, and correspondingly higher market penetration. An alternative explanation is that higher incomes simply tend to be associated with higher mainlines per hundred; OECD countries can simply afford better telecommunication systems. Interaction of the variables PS and PSOECD suggests that the net effect of private holdings is positive, with a 1-percentage point increase in private holdings driving network penetration up by 0.06 mainlines per hundred.

The estimated coefficients for MAPOLICY and GATSPOLICY appear statistically significant at the 5-percent and 10-percent level, respectively, while that for NTPOLICY does not appear significant. Several factors seem important in this respect. First, scheduling guidelines issued to WTO member countries during the Uruguay Round defined market access limitations, but not national treatment limitations. This may have assisted countries in more readily identifying and scheduling market access barriers, and hindered identification of national treatment barriers. Second, by scheduling convention, where a measure was identified as being a limitation on both market access and national treatment, countries were directed to
capture the measures in the market access column alone, increasing the amount of information about nontariff barriers in the market access commitments while reducing such information in national treatment commitments. Last, as noted above, the GBT Agreement promoted the scheduling of effective market access commitments by formulating agreed pro-competitive regulatory principles, and by controlling for practical impediments to market access identified in the GBT Chairman’s note.

The estimated coefficient of PD is statistically significant at the 10-percent level, though the coefficient itself is near zero, and the variable REFORM did not prove statistically significant. With respect to the former, a possible explanation is that a fair number of developing economies with low market penetration rates have high population densities. For instance, Bangladesh, India, and El Salvador rank among the 10 most densely populated countries in this sample. With respect to the latter, the principal difficulty may be one of measurement. It is difficult to specifically define what constitutes reform, and to differentiate between genuine reforms and “paper” reforms.

Quantity Impacts

Given these econometric results, it is possible to simulate the implied quantity effects of impediments to trade in voice telephone services. Because the market access policy variable appears to be most robust, quantity impacts are computed by multiplying the estimated coefficient of MAPOLICY by the difference between the highest possible score for the variable (i.e., 4) and the market access policy scores computed for each country, which range in value from 0 to 4. Quantity impacts for all 67 markets are presented in table 2. The quantity impacts show that the adoption of fully liberal market access policies would increase market penetration rates in relatively restrictive countries, such as Bangladesh and Brazil, by a great deal, specifically by 11.2 mainlines per hundred. In less restrictive countries, where market access policies are nearly fully liberalized, as in many OECD markets, market penetration would increase by a relatively small amount if market access policies were fully liberalized.

Conclusion

Evolving developments in voice telephone services could provide a future opportunity to refine this analysis by factoring in the policy commitments to packet- and circuit-switched data transmission, since it is now believed that data transmission volumes approximately match voice transmissions. Use of such variables would provide for more comprehensive analysis, perhaps yielding insights relevant to electronic commerce. It would also be worthwhile to explore cellular communications more thoroughly as this communication appears to be a significant complement to, and especially in developing countries a substitute for, wireline networks. Incorporation of cellular communications would provide a forward-looking dimension to the analysis, providing a useful baseline from which to measure the effects of liberalizing emerging communication technologies. Finally, further refinements to this methodology might be considered after conclusion of the Doha Round of GATS negotiations, when analysis of new telecommunication commitments may yield estimates of lower quantity impacts, providing a measure of liberalization bound in GATS commitments.
### Table 2
Quantity impacts: Predicted change in mainlines and percent change in mainlines due to full liberalization, 2000

<table>
<thead>
<tr>
<th>Country</th>
<th>Change in mainlines</th>
<th>%</th>
<th>Country</th>
<th>Change in mainlines</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>7.52</td>
<td>192</td>
<td>Italy</td>
<td>1.40</td>
<td>3</td>
</tr>
<tr>
<td>Argentina</td>
<td>8.20</td>
<td>38</td>
<td>Jamaica</td>
<td>9.10</td>
<td>46</td>
</tr>
<tr>
<td>Australia</td>
<td>2.80</td>
<td>5</td>
<td>Japan</td>
<td>4.00</td>
<td>7</td>
</tr>
<tr>
<td>Austria</td>
<td>1.40</td>
<td>3</td>
<td>Korea</td>
<td>4.20</td>
<td>9</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>11.20</td>
<td>3,111</td>
<td>Luxembourg</td>
<td>1.40</td>
<td>2</td>
</tr>
<tr>
<td>Barbados</td>
<td>7.00</td>
<td>16</td>
<td>Malaysia</td>
<td>11.20</td>
<td>56</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.40</td>
<td>3</td>
<td>Mauritius</td>
<td>11.20</td>
<td>48</td>
</tr>
<tr>
<td>Belize</td>
<td>4.90</td>
<td>33</td>
<td>Mexico</td>
<td>7.70</td>
<td>62</td>
</tr>
<tr>
<td>Bolivia</td>
<td>10.50</td>
<td>174</td>
<td>Morocco</td>
<td>11.20</td>
<td>223</td>
</tr>
<tr>
<td>Brazil</td>
<td>11.20</td>
<td>62</td>
<td>Netherlands</td>
<td>1.40</td>
<td>2</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>10.75</td>
<td>44</td>
<td>New Zealand</td>
<td>2.80</td>
<td>6</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>7.52</td>
<td>21</td>
<td>Norway</td>
<td>0.70</td>
<td>1</td>
</tr>
<tr>
<td>Canada</td>
<td>5.60</td>
<td>8</td>
<td>Pakistan</td>
<td>11.20</td>
<td>519</td>
</tr>
<tr>
<td>Chile</td>
<td>4.90</td>
<td>22</td>
<td>Papua New Guinea</td>
<td>6.30</td>
<td>467</td>
</tr>
<tr>
<td>Colombia</td>
<td>7.60</td>
<td>45</td>
<td>Peru</td>
<td>7.70</td>
<td>115</td>
</tr>
<tr>
<td>Cote d'Ivoire</td>
<td>7.60</td>
<td>427</td>
<td>Philippines</td>
<td>11.05</td>
<td>276</td>
</tr>
<tr>
<td>Croatia</td>
<td>9.10</td>
<td>25</td>
<td>Poland</td>
<td>8.05</td>
<td>29</td>
</tr>
<tr>
<td>Cyprus</td>
<td>11.20</td>
<td>17</td>
<td>Portugal</td>
<td>7.00</td>
<td>16</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>7.00</td>
<td>19</td>
<td>Romania</td>
<td>7.00</td>
<td>40</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.40</td>
<td>2</td>
<td>Senegal</td>
<td>9.40</td>
<td>435</td>
</tr>
<tr>
<td>Ecuador</td>
<td>11.20</td>
<td>112</td>
<td>Singapore</td>
<td>7.93</td>
<td>16</td>
</tr>
<tr>
<td>El Salvador</td>
<td>4.00</td>
<td>40</td>
<td>South Africa</td>
<td>9.10</td>
<td>80</td>
</tr>
<tr>
<td>Finland</td>
<td>3.50</td>
<td>6</td>
<td>Spain</td>
<td>2.80</td>
<td>7</td>
</tr>
<tr>
<td>France</td>
<td>1.40</td>
<td>2</td>
<td>Sri Lanka</td>
<td>10.90</td>
<td>268</td>
</tr>
<tr>
<td>Germany</td>
<td>1.40</td>
<td>2</td>
<td>Suriname</td>
<td>10.30</td>
<td>59</td>
</tr>
<tr>
<td>Greece</td>
<td>7.00</td>
<td>13</td>
<td>Sweden</td>
<td>1.40</td>
<td>2</td>
</tr>
<tr>
<td>Guatemala</td>
<td>2.80</td>
<td>49</td>
<td>Switzerland</td>
<td>4.20</td>
<td>6</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>6.70</td>
<td>11</td>
<td>Thailand</td>
<td>11.20</td>
<td>121</td>
</tr>
<tr>
<td>Hungary</td>
<td>7.00</td>
<td>19</td>
<td>Trinidad &amp; Tobago</td>
<td>6.40</td>
<td>28</td>
</tr>
<tr>
<td>Iceland</td>
<td>1.40</td>
<td>2</td>
<td>Tunisia</td>
<td>11.20</td>
<td>125</td>
</tr>
<tr>
<td>India</td>
<td>11.20</td>
<td>350</td>
<td>United States</td>
<td>2.80</td>
<td>4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>6.62</td>
<td>211</td>
<td>United Kingdom</td>
<td>1.40</td>
<td>2</td>
</tr>
<tr>
<td>Ireland</td>
<td>7.00</td>
<td>17</td>
<td>Venezuela</td>
<td>10.40</td>
<td>96</td>
</tr>
<tr>
<td>Israel</td>
<td>9.20</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by the U.S. International Trade Commission.
APPENDIX A
Key Performance Indicators of Selected Industries and Regions

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>Harry Lenchitz</td>
<td>A-2</td>
</tr>
<tr>
<td></td>
<td>(202) 205-2737</td>
<td>A-3</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:hlenchitz@usitc.gov">hlenchitz@usitc.gov</a></td>
<td></td>
</tr>
<tr>
<td>Automobiles</td>
<td>Laura A. Polly</td>
<td>A-4</td>
</tr>
<tr>
<td></td>
<td>(202) 205-3408</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:polly@usitc.gov">polly@usitc.gov</a></td>
<td></td>
</tr>
<tr>
<td>Unwrought Aluminum</td>
<td>Judith-Anne Webster</td>
<td>A-5</td>
</tr>
<tr>
<td></td>
<td>(202) 205-3489</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:webster@usitc.gov">webster@usitc.gov</a></td>
<td></td>
</tr>
<tr>
<td>Flat Glass</td>
<td>Vincent DeSapio</td>
<td>A-6</td>
</tr>
<tr>
<td></td>
<td>(202) 205-3435</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:desapio@usitc.gov">desapio@usitc.gov</a></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>Cynthia Payne</td>
<td>A-7</td>
</tr>
<tr>
<td></td>
<td>(202) 205-3410</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:Payne@usitc.gov">Payne@usitc.gov</a></td>
<td></td>
</tr>
<tr>
<td>North American Trade</td>
<td>Audry Tafoya²</td>
<td>A-8</td>
</tr>
<tr>
<td></td>
<td>Ruben Mata</td>
<td>A-9</td>
</tr>
<tr>
<td></td>
<td>(202) 205-3403</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:mata@usitc.gov">mata@usitc.gov</a></td>
<td></td>
</tr>
</tbody>
</table>

1 The data and views presented for the following indicators are compiled from the industry sources noted and are those of the authors. They are not the views of the United States International Trade Commission as a whole or of any individual Commissioner. Nothing contained in this information based on published sources should be construed to indicate how the Commission would find in an investigation conducted under any statutory authority.

2 Research assistance provided by Audry Tafoya, intern from the Center for North American Studies, American University.
AUGUST 2003

Key Performance Indicators

Industry Trade and Technology Review

STEEL

Figure A–1
Operating income trends down for minmill and specialty producers during first quarter 2003¹

<table>
<thead>
<tr>
<th></th>
<th>Q1 1998</th>
<th>Q1 1999</th>
<th>Q1 2000</th>
<th>Q1 2001</th>
<th>Q1 2002</th>
<th>Q1 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated</td>
<td>20</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Minimill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Operating income as a percent of sales. Integrated group contains 5 firms. Minimill group contains 7 firms. Specialty group contains 4 firms.

Note.--First quarter 2003 integrated group includes 1 previously untracked firm, and no longer includes 1 previously tracked firm, reflecting ownership changes in the industry.

Source: Individual company financial statements.

- The U.S. Bankruptcy Court for the Northern District of West Virginia gave its final approval to Weirton Steel Corp. for a $225 million debtor-in-possession (DIP) financing facility on June 16, 2003. Weirton had been operating under interim DIP financing since filing a voluntary petition for reorganization under Chapter 11 bankruptcy in May, 2003. See http://www.weirton.com
- The United Steelworkers of America (USWA) announced that union members at six former Bethlehem Steel locations ratified a labor contract with the new owners of the facilities, International Steel Group (ISG), on June 16, 2003. The agreement brings the former Bethlehem employees into the contract that covers former LTV and Acme Steel employees now employed by ISG. See http://www.uswa.org
- Wheeling-Pittsburgh Corporation (WPC) formally exited bankruptcy on August 1, 2003, after signing a new labor agreement with the United Steel Workers of America (USWA). A new labor agreement was one of the Emergency Steel Loan Guarantee Board’s conditions when it approved WPC’s $250 million loan guarantee application in March 2003. See http://www.wpsc.com and http://www.uswa.org
- United States Steel Corporation (USS) signed a letter of intent with International Steel Group Inc. (ISG) to exchange the assets of its plate business, including the plate mill at Gary Works, for the assets of ISG’s No. 2 pickle line at Indiana Harbor Works, on August 13, 2003. The transaction is expected to close in the fourth quarter of 2003. See http://www.uss.com

Table A–1
Imports decrease and exports increase during first quarter 2003 compared to fourth quarter 2002, and also compared to first quarter year ago

<table>
<thead>
<tr>
<th>Item</th>
<th>Q4 2002</th>
<th>Q4 2002</th>
<th>Q1 2003¹</th>
<th>Q1 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producers’ shipments (1,000 short tons)</td>
<td>24,358</td>
<td>6.9</td>
<td>26,037</td>
<td>8.8</td>
</tr>
<tr>
<td>Finished imports (1,000 short tons)</td>
<td>6,418</td>
<td>-20.3</td>
<td>5,113</td>
<td>-12.6</td>
</tr>
<tr>
<td>Ingots, blooms, billets, and slabs (1,000 short tons)</td>
<td>2,258</td>
<td>-41.1</td>
<td>1,331</td>
<td>-43.9</td>
</tr>
<tr>
<td>Exports (1,000 short tons)</td>
<td>1,581</td>
<td>25.6</td>
<td>1,986</td>
<td>34.9</td>
</tr>
<tr>
<td>Apparent supply, finished (1,000 short tons)</td>
<td>29,195</td>
<td>-0.1</td>
<td>29,164</td>
<td>3.0</td>
</tr>
<tr>
<td>Ratio of finished imports to apparent supply (percent)</td>
<td>22.0</td>
<td>²-4.5</td>
<td>17.5</td>
<td>²3.2</td>
</tr>
</tbody>
</table>

¹Preliminary.
²Percentage point change.

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

Source: American Iron and Steel Institute.
Table A–2
Steel service centers: Shipments increase and inventories decrease during first quarter 2003 compared to fourth quarter 2002, consistent with seasonal demand trends

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipments (1,000 short tons)</td>
<td>3,213</td>
<td>4,102</td>
<td>23.9</td>
<td>12,416</td>
<td>11,702</td>
<td>-5.8</td>
</tr>
<tr>
<td>Ending inventories (1,000 short tons)</td>
<td>15,117</td>
<td>14,044</td>
<td>-7.1</td>
<td>13,222</td>
<td>14,044</td>
<td>6.2</td>
</tr>
<tr>
<td>Inventories on hand (months)</td>
<td>4.7</td>
<td>3.4</td>
<td>('')</td>
<td>3.2</td>
<td>3.4</td>
<td>('')</td>
</tr>
</tbody>
</table>

1 Not applicable.

Note.—Metals Service Center Institute data collection and presentation methods have been updated. Data presented for Dec. 2002 and first quarter 2002 have been updated, and differ from previously published data.

Source: Metals Service Center Institute.

- U.S. service center steel shipments for first quarter 2003 were down, and inventories were up, compared to shipments and inventories for first quarter 2002 (table A-2), according to the Metals Service Center Institute. See http://www.ssci.org
- The American Institute for International Steel import market survey (June 2003) predicts a drop in import orders for the next 3 to 5 months for most steel products, including semifinished, hot and cold rolled, corrosion resistant, and structural, while import orders for cut-to-length plate, wire rod, and pipe and tube remain essentially unchanged. See http://www.aiss.org
- World crude steel production for the first 6 months of 2003 was 513 million tons, an increase of 8.2 percent compared with the first 6 months of 2002, according to the International Iron and Steel Institute. China produced 114 million tons, accounting for more than 22 percent of world production thus far for 2003. See http://www.worldsteel.org
- Domestic capability utilization continued to decline during first quarter 2003 (Figure A-2). The drop in capability utilization was largely driven by the results of integrated producers, whose shipments were down by almost 10 percent from fourth quarter 2002. Modest increases in shipments by minimill and specialty producers did little to increase their capability utilization. See http://www.steel.org

Figure A–2
Steel mill products, all grades: Capability utilization drops below 90 percent during fourth quarter 2002 but remains well above capability utilization during fourth quarter 2001

Note.—Capability utilization is the raw steel tonnage produced divided by the tonnage capability to produce raw steel for a sustained full order book.

Source: American Iron and Steel Institute.
AUTOMOBILES

Table A–3

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. sales of domestic passenger vehicles (1,000 units)</td>
<td>3,602</td>
<td>6,594</td>
<td>20.4</td>
<td>-3.4</td>
</tr>
<tr>
<td>U.S. sales of imported passenger vehicles (1,000 units)</td>
<td>863</td>
<td>1,638</td>
<td>11.4</td>
<td>1.6</td>
</tr>
<tr>
<td>Total U.S. sales (1,000 units)</td>
<td>4,465</td>
<td>8,232</td>
<td>18.5</td>
<td>-2.4</td>
</tr>
<tr>
<td>Ratio of U.S. sales of imported passenger vehicles to total U.S. sales (percent)</td>
<td>19.3</td>
<td>19.9</td>
<td>-6.1</td>
<td>4.1</td>
</tr>
<tr>
<td>U.S. sales of Japanese imports as a share of the total U.S. market (percent)</td>
<td>10.1</td>
<td>10.6</td>
<td>-10.9</td>
<td>5.2</td>
</tr>
</tbody>
</table>

1 Domestic passenger vehicles include U.S.-, Canadian-, and Mexican-built cars and light trucks sold in the United States.
2 Imported passenger vehicles do not include cars and light trucks supplied by Canada and Mexico.

Note.—Data for 2003 forward include cars and light trucks; year-to-date data for 2002 also include cars and light trucks.

Source: Compiled from data obtained from Automotive News.

• For the first half of 2003, light trucks accounted for 51 percent of total passenger vehicle sales in the United States, 56 percent of domestic passenger vehicle sales, and 33 percent of import vehicle sales. During the same period, imports from Japan of light trucks accounted for 10 percent of total U.S. light truck sales.

• General Motors, Ford, and DaimlerChrysler have been the market leaders in light trucks; however, Japanese automakers have made significant recent investments in their light truck manufacturing capacity in the United States. For example, in May 2003, Nissan opened a new assembly plant in Canton, MS for minivan, pickup truck, and SUV production.

• U.S. industry officials claim that, since 2000, the weak yen has contributed to the intense competition for U.S. market share, and that the unfavorable currency conditions caused General Motors, Ford, and DaimlerChrysler to lose a combined 8.4 percentage points of domestic market share, which translates into over 1.6 million lost passenger vehicle sales worth over $35 billion.

Figure A–3
U.S. sales of new passenger vehicles (cars and light trucks) increased in the second quarter 2003; sales of domestic passenger vehicles as a percentage of total U.S. sales gain significantly compared to first quarter 2003

Note.—Domestic sales include U.S.-, Canadian-, and Mexican-built vehicles sold in the United States; these same units are not included in import sales. From first quarter 2003 forward, data are shown for sales of cars only as well as cars and light trucks combined (passenger vehicles).

Source: Automotive News; prepared by the Office of Industries.
Imports from Russia increased significantly in March as shipments delayed by freezing weather at the Port of St. Petersburg arrived in the United States after a spring thaw allowed port operations to resume.

Rising prices for unwrought aluminum in the first quarter of 2003 reflect the high cost of alumina, declining production in the Pacific Northwest, and concern on the metal market over supply constraints that might result during the war with Iraq.

Current developments indicate that consumption of U.S.-made unwrought aluminum and semifabricated aluminum products will likely increase as car manufacturers continue to replace iron and steel with aluminum due to its lighter weight and improved fuel efficiency. For example, Toyota plans to increase production of its truck engines at its Alabama facility (consuming 15-million pounds more of U.S.-supplied aluminum annually), and Ford has decided to use aluminum alloys smelted in the Midwest for the 2004 F-150's rack and pinion steering housings along with aluminum front axle carriers and tubes on its standard-size 150's which will be made in the United States.

### Table A–4

<table>
<thead>
<tr>
<th>Item</th>
<th>Q1 2002</th>
<th>Q4 2002</th>
<th>Q1 2003</th>
<th>Q1 2003 from Q1 2002</th>
<th>Q1 2002 from Q4 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary production (1,000 metric tons)</td>
<td>627</td>
<td>708</td>
<td>700</td>
<td>11.6</td>
<td>-1.1</td>
</tr>
<tr>
<td>Secondary recovery (1,000 metric tons)</td>
<td>735r</td>
<td>741r</td>
<td>721</td>
<td>-1.9</td>
<td>-2.7</td>
</tr>
<tr>
<td>Imports (1,000 metric tons)</td>
<td>720</td>
<td>669</td>
<td>826</td>
<td>14.7</td>
<td>23.5</td>
</tr>
<tr>
<td>Import penetration (percent)</td>
<td>36.0</td>
<td>32.6</td>
<td>37.6</td>
<td>'1.6</td>
<td>'5.0</td>
</tr>
<tr>
<td>Exports (1,000 metric tons)</td>
<td>82</td>
<td>67</td>
<td>50</td>
<td>-39.0</td>
<td>-25.4</td>
</tr>
<tr>
<td>Average nominal price (cents/lb)</td>
<td>65.2</td>
<td>65.1</td>
<td>67.6</td>
<td>3.7</td>
<td>3.8</td>
</tr>
<tr>
<td>LME inventory level (1,000 metric tons)</td>
<td>1,029</td>
<td>1,243</td>
<td>1,318</td>
<td>28.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

1 Percentage point change

Note.—Revised data indicated by "r."

Sources: Compiled from data obtained from U.S. Geological Survey and World Bureau of Metal Statistics.
FLAT GLASS

Figure A-5
Japanese monthly average imports show increase during first 5 months of 2003


Background

• Although the U.S.-Japanese agreement on Japanese market access for imports of flat glass which sought to increase access and sales of foreign flat glass in Japan expired on December 31, 1999, the U.S. Government continues to urge the Japanese Government to take steps to promote access and competition in its glass market and continues to work with U.S. industry to achieve these goals. The U.S. Government has had some success in urging Japan to modify regulations that would facilitate use of energy-efficient glass in Japan.

• U.S. and Japanese negotiators have agreed that Japan's Ministry of Trade and Industry (MITI), in conjunction with the Japan Fair Trade Commission (JFTC), should monitor Japanese flat glass manufacturers and the glass distribution system in Japan to promote competition in the sector.

Current

• Greater Japanese demand for imported flat glass, encouraged by a somewhat more positive outlook for the Japanese economy, increased average monthly Japanese imports from all countries by 28 percent for the first 5 months of 2003 to 2.8 million square meters compared with the same period of 2002. The average monthly value of total Japanese flat glass imports increased 39 percent during the first 5 months of 2003 to $17.7 million compared with the average monthly value for the comparable period in 2002.

• Japanese imports from the United States increased by quantity and value during the first 5 months of 2003 compared to the same period in 2002 (up 29 percent to 305,000 square meters and 93 percent to $6.3 million, respectively). Average monthly imports from the United States for full-year 2002 had decreased 32 percent in quantity and 54 percent in value compared with full-year 2001.

1 Data for Jan.-May (Latest available data).

---

3 USTR, Annual Submission by the Government of the United States to the Government of Japan on Deregulation and Competition Policy, Oct. 12, 2000, p. 32.
SERVICES

Figure A–6
Balance on U.S. service trade accounts, by quarter, 2002 and 2003

Figure A–7
Surpluses on cross-border U.S. services transactions with selected trading partners, by quarter, 2001-2003

1 Includes passenger fares, freight and port services.


1 Private-sector transactions only; military shipments and other public-sector transactions have been excluded.

NORTH AMERICAN TRADE HIGHLIGHTS

U.S. trade with its North American partners is highlighted in table A-5. The following is a summary of key developments during the first quarter of 2003.

- Total U.S. imports from Mexico increased 8 percent from the first quarter 2002 to the first quarter of 2003, reaching $134 billion. This growth reflects a moderate quarter-to-quarter increase of 1.9 percent in the U.S. gross domestic product that was driven largely by crude petroleum, which in turn accounted for 70 percent of the expansion in the total value of imports. The higher 2003 price for crude oil was due in part to uncertainty about oil supply from the Middle East, Nigeria, and Venezuela, and the onset of the Iraq war in late March 2003. The significance of petroleum in U.S.-Mexico trade was emblematic of total U.S. trade in the first quarter 2003, as three-fourths of the $6.2-billion increase in the U.S. trade deficit with all partners during January-March 2003 was attributable to petroleum imports.

- Total U.S. imports from Canada grew by 10 percent despite a 5.3 percent year-to-year increase in value of the Canadian dollar (to 73 cents) relative to the U.S. dollar. For many products, the appreciation in the Canadian dollar results in U.S. consumers paying more for imports from Canada. In contrast to U.S.-Mexico trade, petroleum accounted for 31 percent of the increase in U.S. imports from Canada in first quarter 2003.

- Total U.S. exports to Mexico decreased by 3 percent, despite a 0.9-percent quarter-to-quarter growth in the Mexican manufacturing industry. Total U.S. exports to Canada increased by 7 percent January-March 2003, largely attributable to a strong increase in Canadian consumer expenditures that rose 3.5 percent quarter to quarter.

- Harsh winter weather in portions of the Eastern United States in 2003 compared with the relatively mild winter of 2002 led to a slowdown in housing construction in that region. That, in turn, dampened U.S. imports of forest products from Canada, which decreased by 9 percent in the first quarter 2003.

- The value of U.S. imports of Canadian automobiles was reduced slightly during January-March 2003, reflecting the sluggish U.S. automobile market. U.S. vehicle purchases are at a 4½ year low reported as a result of the slow U.S. economic recovery and overcapacity in the global auto industry. Despite offering consumers financial incentives and quality improvements to stimulate demand, these initiatives reportedly have reduced U.S. auto industry profits in order to maintain stability in sales volume.

- Mexican vehicle exports to the U.S. market decreased 7.7 percent in the first quarter of 2003, continuing a trend of negative growth in this export sector, which industry observers do not expect to improve in the immediate future. This is due, in part, to the differentiated nature of North American automobile production with Mexico’s focus on subcompact and mid-size automobiles rather than light trucks and SUVs which is the strength of the U.S. industry. However, the downward trend in Mexican auto exports was countered by significant growth in Mexican auto parts exports. The combined value of U.S. imports of seats, wiring harnesses, engines, pumps, ignitions, and other motor-vehicle parts from Mexico increased from $3.7 billion in first quarter of 2002 to $4.7 billion in first quarter of 2003, a 17-percent increase.

---

8 Official statistics of the U.S. Department of Commerce.
NORTH AMERICAN TRADE

Table A-5

<table>
<thead>
<tr>
<th>Item</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2002/03</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.-Mexico trade:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total imports from Mexico . . . . . . . .</td>
<td>93,017</td>
<td>109,018</td>
<td>134,734</td>
<td>130,509</td>
<td>134,121</td>
<td>31,056</td>
</tr>
<tr>
<td>U.S. imports under NAFTA:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total value . . . . . . . . . . . . . . .</td>
<td>68,326</td>
<td>71,317</td>
<td>83,995</td>
<td>81,162</td>
<td>84,747</td>
<td>19,559</td>
</tr>
<tr>
<td>Percent of total imports . . . . . . . .</td>
<td>73</td>
<td>65</td>
<td>62</td>
<td>62</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>Total exports to Mexico . . . . . . . .</td>
<td>75,369</td>
<td>81,381</td>
<td>100,442</td>
<td>90,537</td>
<td>86,076</td>
<td>20,184</td>
</tr>
<tr>
<td>U.S. merchandise trade balance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Mexico</td>
<td>-17,648</td>
<td>-27,637</td>
<td>-34,292</td>
<td>-39,971</td>
<td>-48,045</td>
<td>-10,873</td>
</tr>
<tr>
<td>U.S.-Canada trade:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total imports from Canada . . . . . . .</td>
<td>174,685</td>
<td>198,242</td>
<td>229,060</td>
<td>216,836</td>
<td>210,518</td>
<td>50,610</td>
</tr>
<tr>
<td>U.S. imports under NAFTA:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total value . . . . . . . . . . . . . . .</td>
<td>111,675</td>
<td>115,715</td>
<td>123,052</td>
<td>113,179</td>
<td>115,807</td>
<td>27,301</td>
</tr>
<tr>
<td>Percent of total imports . . . . . . . .</td>
<td>64</td>
<td>58</td>
<td>54</td>
<td>52</td>
<td>55</td>
<td>54</td>
</tr>
<tr>
<td>Total exports to Canada . . . . . . . .</td>
<td>137,768</td>
<td>145,731</td>
<td>155,601</td>
<td>144,621</td>
<td>142,543</td>
<td>34,031</td>
</tr>
<tr>
<td>U.S. merchandise trade balance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Canada</td>
<td>-36,918</td>
<td>-52,511</td>
<td>-73,459</td>
<td>-72,215</td>
<td>-67,975</td>
<td>-16,579</td>
</tr>
</tbody>
</table>

1Percentage point change.
2 The negative (-) symbol indicates a loss or trade deficit. The $48.0-billion deficit in U.S. merchandise trade with Mexico in 2002 was partially offset by a $4.7-billion U.S. surplus in bilateral services trade.
3 The $68.0-billion deficit in U.S. merchandise trade with Canada in 2002 was partially offset by a $5.8-billion U.S. surplus in bilateral services trade. During the first quarter of 2003 the U.S. surplus in bilateral services trade was $2.6 billion, not seasonally adjusted.


- Within the Mexican manufacturing sector, the industries with the strongest quarter-to-quarter growth were basic metallic products (12.6 percent); non-metallic metals (7.3 percent); construction (5.9 percent); chemicals (5.7 percent); and paper, printing, and publishing (3.9 percent). Growth in these industries, which are less dependent on imported components for production, can be contrasted to a 3.3-percent decrease in Mexican textile exports.8

- In addition to crude petroleum, natural gas is a significant part of U.S. trade with its North American partners. Electricity companies are making greater use of natural gas to fuel their power generation plants, leading to increased demand and prices for natural gas in the United States.10 This is reflected in the $3.1-billion rise in U.S. imports of natural gas from Canada during January-March 2003. Domestic demand for natural gas also is rising in Mexico with the expansion of energy-intensive manufacturing.

---