Short-Circuited:
Dumping and America’s Consumer Electronics Industry

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Executive Summary

The U.S. consumer electronics industry was once a world leader, but despite strong growth in U.S. and global consumption of consumer electronics, the U.S. industry is now a shadow of its former self. Why is the United States such a minor player in consumer electronics when factor endowments imply a stronger presence? A major reason is that the United States government inadequately enforced its laws against dumping – the sale of goods at less than their price in the home market.

Today, domestic critics are aiming to weaken those same antidumping measures. Likewise, Japan and other frequent targets of U.S. unfair trade laws also are seeking to negotiate limits on those laws during the next round of multilateral trade talks. For those reasons, the story of the U.S. consumer electronics industry remains particularly relevant. The fall of that industry usefully illustrates the impact that market distortions can have on other U.S. industries if unfair trade laws are substantially weakened.

This study explores the lessons offered by the U.S. consumer electronics industry and demonstrates that dumping, far from being a short-term phenomenon, can have long-lasting economic consequences.

From Innovation to Emasculation . . . and Back?

After Thomas Edison’s invention of the phonograph in 1877, U.S. firms were major players in the global consumer electronics industry, and also the source of many innovations. In 1958, U.S. firms dominated the home market and generated a trade surplus of $45 million.

The next decade saw a rapid growth in imports, largely the result of dumped goods from Japan. In 1969, import penetration stood at 22.7 percent, and the trade deficit was more than $1 billion. By 1996, imports were 75 percent of apparent consumption. In 1998, the trade deficit was $14.6 billion (see Exhibit ES.1).
Rising imports had a dramatic effect on U.S. consumer electronics producers. From 1966 to 1996, the industry shed 100,000 employees. Several companies either went out of business or were purchased by producers based in Europe or Asia. After 1987, relative wages in consumer electronics dropped well below the U.S. manufacturing average.

U.S. producers of televisions were especially hard-hit. From 1968 to 1990, the number of U.S. firms producing televisions declined from twenty-eight to one. Today, there are no U.S.-owned mass producers of color televisions.

Moreover, though a U.S. company, General Instruments, was responsible for developing the core digital technology for digital high-definition television (HDTV), when the first digital-format HDTVs appeared on the shelves of U.S. stores in late 1998, not one U.S. firm was represented.
The Global Consumer Electronics Industry:
The Intersection of Comparative Advantage and Industrial Policy

Though technological change, differences in factor costs, and changes in relative efficiency are at the root of changes in competitiveness within and across countries, they are not the only factors at work. Governments can, and have, played an important role in determining the competitive balance within industries and across national boundaries.

This was certainly the case with consumer electronics. Market-based factors, such as improved production processes in Japan and lower factor costs in developing countries, affected the development of the global industry. However, industrial policies in various countries also determined competitive outcomes in many important ways.

The initial source of market distortions in the global consumer electronics industry was Japan’s industrial policies, which created an environment conducive to rapid expansion of capacity, the formation of cartels, and dumping.

The television industry yields the most telling evidence of how market distortions affected the consumer electronics industry. Japan’s industrial policies significantly increased television production capacity. To deal with the resulting glut, Japan’s manufacturers and distributors formed a price cartel in 1956, and a variety of other cartels in later years, in order to keep domestic prices high. Japan’s Fair Trade Commission did little to stop the rampant collusion. The domestic market was kept virtually import-free by tariff and a variety of nontariff barriers. Thus, Japanese television prices were twice those of comparable products in world markets.

In the meantime, Japanese consumer electronics firms began dumping product into the United States and Europe. In the United States, they coordinated prices and limited the number of U.S. customers to which each company could sell. Japan’s success compelled European governments likewise to implement a range of market-distorting measures of their own, in order to preserve local ownership and
employment. Other Asian countries, starting with Korea, also sought to emulate Japan’s successful market-distortion strategy, though many of them relied heavily on foreign, rather than domestic, capital.

In short, the intersection of policy and market forces was a dangerous one for the U.S. consumer electronics industry, leaving it increasingly vulnerable to protected Asian and European competitors. Faced with such competitive pressures for as far as the eye could see, U.S. producers did the logical thing: they either liquidated or sold their businesses to overseas buyers.

The Slow U.S. Response, and Its Costs

By nearly all accounts, the U.S. government’s response to the challenges posed by Japanese electronics imports was inadequate, even though several government entities were involved.

That inadequacy was most glaring in the television industry. Washington, quite simply, failed to enforce U.S. trade law. Acting on the antidumping petition of 1968, the U.S. Treasury decided Japanese firms were dumping, but took seven years to come up with the dumping margin. The case remained unresolved for more than a decade, and only about $16 million of the $400 million levy was ever collected. An antitrust case was also filed, but it dragged on for more than a decade before the Supreme Court (which doubted that outsized profits could enable the defendants to recoup earlier losses) exonerated the remaining Japanese defendants.

With the Congress becoming increasingly uneasy over the situation, the Carter Administration implemented a series of orderly marketing agreements (OMAs) covering television imports from Japan, Korea, and Taiwan. Despite the temporary relief provided by the OMAs, the accord ironically accelerated the U.S. industry’s demise. Timely implementation of antidumping law would have been better for the U.S. industry. Antidumping levies would have penalized Japanese producers directly and encouraged Japan’s imitators to adopt market-friendly policies. The U.S. economy as a whole would have been better off because the government would have collected antidumping duties. In contrast, OMAs enabled foreign producers to collect rents. U.S. consumers would have been no worse off because an antidumping
remedy could have achieved the same quantity and price outcome for Japanese imports as an OMA. Even with the OMA, the loss to consumers was found to be extremely small.

On the other hand, the full cost of losing the consumer electronics industry is probably quite high. Because workers laid off from the industry through the mid 1980s entered a weak job market, they were unemployed for almost six months and earned lower wages (4-to-10 percent lower from 1979 to 1985) once they were reemployed. Furthermore, rising import competition, the decline in U.S. ownership, and the shuttering of U.S. facilities suggest that a premature erosion of existing capital stock also occurred.

There have also been longer-term effects on wage income and investment. Wages in the consumer electronics industry have dropped to about 80 percent of the manufacturing average (see Exhibit ES.2). Moreover, there was a distinct slowdown in real investment per employee during the late 1960s and 1970s, when the U.S. industry was under siege (see ES.3). Department of Commerce statistics on foreign direct investment indicate that a portion of this foregone investment was shifted overseas.
Exhibit ES.2 Ratio of Wages in the Consumer Electronics Industry to Economy-Wide Private-Sector Wages, 1959-1996.

Sources: Bureau of Labor Statistics and Bureau of the Census.


Other costs include foregone sales revenue, foregone research and development expenditures, and adverse trade flows (see exhibit ES.4). Higher prices are also a risk in the long term if the lack of domestic competitors leads overseas exporters to raise prices. However, antitrust actions by the states’ attorneys general against Matsushita in the late 1980s, competition from manufacturers based in Europe and Asia, and advances in manufacturing technology have kept consumer electronics prices relatively low.
**Exhibit ES.4 Assessment of the Dynamic Costs of Losing the Consumer Electronics Industry.**

<table>
<thead>
<tr>
<th>Potential Costs</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages and Employment</td>
<td>• High adjustment costs for displaced workers from 1970-85</td>
</tr>
<tr>
<td></td>
<td>• Declining employment in a growth industry</td>
</tr>
<tr>
<td></td>
<td>• Decline in relative hourly wage</td>
</tr>
<tr>
<td>Capital Expenditures</td>
<td>• Premature erosion of capital stock during 1960s and 1970s</td>
</tr>
<tr>
<td></td>
<td>• Investment slump during 1966-78</td>
</tr>
<tr>
<td></td>
<td>• Investment generally rising during 1980-96 period; occasional weakness</td>
</tr>
<tr>
<td>Foregone Sales</td>
<td>• Billions of dollars in lost sales (VCRs and other products)</td>
</tr>
<tr>
<td></td>
<td>• Losses accelerated Japanese competition in other industries</td>
</tr>
<tr>
<td></td>
<td>• Poorly positioned for next growth market ($380 bil. HDTV market)</td>
</tr>
<tr>
<td>Higher Prices</td>
<td>• Matsushita's attempt to manipulate U.S. retailers failed</td>
</tr>
<tr>
<td></td>
<td>• Competition, state-driven antitrust actions, manufacturing advances have kept prices low</td>
</tr>
<tr>
<td>Foregone R&amp;D</td>
<td>• U.S.-based R&amp;D activity declined during the '70s and '80s</td>
</tr>
<tr>
<td></td>
<td>• Revenue stream could have funded substantial R&amp;D efforts</td>
</tr>
<tr>
<td></td>
<td>• R&amp;D likely shifted to other sectors over time</td>
</tr>
<tr>
<td>Structural Trade Deficit</td>
<td>• Probably larger than it should be</td>
</tr>
<tr>
<td></td>
<td>• Likely to grow, as import dependence remains high</td>
</tr>
<tr>
<td></td>
<td>• If it leads to depreciation, U.S. terms of trade are reduced</td>
</tr>
</tbody>
</table>
Conclusions and Discussion

The saga of the U.S. consumer electronics sector vividly illustrates the impact that foreign industrial policies can have on an industry, and also provides an instructive narrative of what can happen when U.S. trade laws are not applied in a timely manner. Most important for the purpose of this paper, the story of the U.S. consumer electronics industry furnishes clues about whether long-term costs really exist.

The conclusions of the study are as follows:

- A major U.S. manufacturing industry in the late 1950s, the U.S. consumer electronics industry today is a minor player in the large and growing U.S. market.
- Both the invisible hand of market forces and the very visible hand of foreign industrial policies influenced the U.S. industry’s decline.
- Foreign industrial and trade policies, cartel activities in Japan, and Washington’s poor enforcement of U.S. trade laws accelerated the U.S. industry’s decline.
- Japan’s aggressive targeting in the consumer electronics industry strongly influenced the shift of electronics production to Asia and Mexico.
- Global trade protection affected the ownership of remaining assets in the U.S. consumer electronics industry.
- The decline of the consumer electronic industry generated several long-term costs to the U.S. economy.

These conclusions are extremely relevant to ongoing trade policy debates in the United States. In particular, the U.S. experience informs policy makers why the enforcement of U.S. trade laws is important and why antidumping laws should be maintained. The global market distortions that persist in many sectors can still wreak havoc on U.S. industries, as U.S. steel producers learned in 1998.

The recent steel crisis bears many similarities to the television crisis a quarter century ago. In both cases, Japan’s market was

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characterized by cartels, limited import competition, and discriminatory
government behavior that encouraged dumping.

There is, however, one important difference. Unlike the
lackluster response in the 1960s and 1970s, the U.S. government has
recently enforced its trade laws against steel dumping, thus sparing the
U.S. steel industry as a whole from the wrenching adjustments
experienced by many U.S. consumer electronic firms.

The story of the U.S. consumer electronics industry is
particularly relevant in the face of ongoing efforts by Japan and other
countries to weaken U.S. antidumping laws by revising the WTO’s
antidumping agreement. Given the market distortions that still exist in
many Japanese industries, the U.S. government’s current position against
revision is entirely appropriate.

Perhaps the most enduring cost of letting the consumer
electronics industry wither was the encouragement it provided other
nations to follow in Japan’s footsteps. The recent Asian crisis and
Japan’s stagnation have taken some of the burnish off Japan’s earlier
successes, but industrial policies have not gone away. Until they do, the
United States is best served by maintaining its trade laws and using them
when necessary.
Chapter 1:

Introduction

The U.S. consumer electronics industry was once a world leader. For most product categories, that is no longer the case. In fact, the industry is now a shadow of its former self, despite strong growth in U.S. and global consumption of consumer electronics.

Moreover, unlike labor-intensive U.S. manufacturing industries (apparel and shoes, for example) that have no comparative advantage, consumer electronics production is capital intensive and R&D intensive.\(^1\) The industry’s profile thus suggests that advanced countries such as the United States should be major producers.

In actual fact, Japan and the European Union have been able to sustain much higher levels of production and employment than the United States. Japan even runs a trade surplus.\(^2\)

Why is the United States a minor player in consumer electronics when factor endowments imply a stronger presence? A major reason is that the U.S. government has inadequately enforced its laws against dumping – the sale of goods at less than their price in the home market or less than their cost of production.

For years, antidumping law and its application have been hotly debated among economic policymakers, analysts, business and consumer groups, and economists. On the one side are those who argue that dumping is a natural business strategy that should go unchallenged by

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\(^1\) In 1996, investment per employee in the consumer electronics industry (SIC 3651) was twenty percent higher than for manufacturing as a whole.

\(^2\) According to Ministry of Finance data, Japan’s trade surplus in consumer electronics was 1,115 billion yen in 1998 ($8.5 billion based on the 1998 exchange rate).
national authorities. On the other side are those who believe that antidumping legislation is an appropriate tool for dealing with the economic disruptions that arise in industries plagued by market distortions.

The debate intensified in 1998 and 1999. The collapse of domestic demand in many of the crisis-hit countries of Asia, and the subsequent contagion caused by the Asian crisis, resulted in a wave of exports to the United States.

U.S. steel markets were hit particularly hard, with the volume of imports rising thirty-three percent during 1998. That import surge led four U.S. steel makers to file for bankruptcy, even as the U.S. economy flourished. The U.S. steel industry reacted by filing antidumping cases in several product categories, including a high-profile case against Japanese, Russian, and Brazilian exporters of hot-rolled coil. Opponents of antidumping laws argued that steel dumping was beneficial to U.S. consumers, while supporters of such laws pointed out that U.S. producers were bearing the brunt of market distortions in other steel-producing countries.

Even though many economies felled by the Asian contagion are beginning to recover, the debate on antidumping laws is likely to persist. During the upcoming round of multilateral trade negotiations, Japan, Korea, and other countries are likely to seek to limit such laws by negotiating restrictions on their use. Moreover, the conditions that encourage dumping in the first place (i.e., the relatively open U.S. market, along with market distortions in strategic industries abroad) do

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3 See, for example, Brink Lindsey, Daniel Griswold, and Aaron Lucas, The Steel “Crisis” and the Costs of Protectionism (Washington, DC: The Cato Institute, 1999), 10.

4 See, for example, Greg Mastel, Antidumping Laws and the U.S. Economy (New York: M.E. Sharpe, 1998), Chapter 4.

5 For an example of the former viewpoint, see Lindsey, Griswold, and Lucas. For an example of the latter, see Greg Mastel and Andrew Szamosszegi, Leveling the Playing Field: Antidumping and the U.S. Steel Industry (Washington, DC: Economic Strategy Institute, 1999).
not seem likely to change appreciably in the foreseeable future. Thus, the United States is almost certain to be a target for dumping, and affected industries are just as certain to resort to U.S. trade laws. Critics and supporters of antidumping laws will no doubt join the fray.

How the U.S. government handles these attacks will ultimately depend on its assessment of the costs and benefits of maintaining antidumping laws. The calculation is a complicated one. The government must consider not only the short-term economic impacts of dumping on producers and consumers, but the long-term political, strategic, and economic impacts as well. Previous government impact assessments, working within the comparative static analytical framework, invariably found that antidumping duties benefited one set of producers at the expense of other producers and consumers. On a net basis, those studies concluded that the levying of antidumping duties generated a relatively small net welfare loss for the U.S. economy.

Given that outcome, why does the United States keep such laws on the books? Critics contend that the benefits of antidumping laws are concentrated, while the costs are diffuse. According to this line of reasoning, the firms and workers hurt by dumping have the most to lose and thus put great effort into maintaining antidumping laws. The cost of antidumping remedies to consumers, on the other hand, is relatively small; therefore, they put little effort into eliminating antidumping laws.

This line of reasoning suffers from two defects. First, consuming industries do argue against specific dumping cases. When combined with substantial opposition from lobbyists and lawyers representing parties that dump, opposition to dumping laws is not inconsequential. Second, the gross costs of antidumping to consumers and consuming industries (which intentionally ignore the substantial benefits to producers) are substantial and well publicized in studies and

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6 For a recent example, see U.S. International Trade Commission, The Economic Effects of Antidumping and Countervailing Duty Orders and Suspension Agreements, Publication 2900 (June 1995).

op-eds.\textsuperscript{8} Thus, Americans that would benefit from dumping are not as impotent or ill informed as the concentrated-costs-diffuse-benefits hypothesis implies.

A second possible explanation for the durability of U.S. antidumping laws is that many Americans are aware of dumping’s “benefits,” but are willing to sacrifice them in order to reduce bankruptcies and job loss. Many Americans tolerate and even celebrate economic dislocation that results from technological innovation and competition. They may be less tolerant of bankruptcies and job losses attributed to firms that are perceived to have an unfair advantage, especially when that advantage reflects government targeting. Knowing that the adverse impact of unfair dumping can visit them, their friends, or their relatives may make Americans less vigilant about maximizing net national welfare than would otherwise be the case.

A third possibility is that the costs of dumping are greater than the comparative static calculations imply, and that Americans are behaving rationally when they refuse to gut antidumping laws. The comparative static methodology provides a snapshot of what occurs in an economy when antidumping duties are levied. It is often said that pictures don’t lie, but the truth is, they only tell part of the story. Dumping that is allowed to continue unchecked will have an impact long beyond the one-year time horizon that is the focus of comparative static analysis. For instance, workers laid off due to dumping may be unable to find work for several months and, once they find work, may be employed in lower paying jobs for the rest of their lives. Indeed, studies that have tried to assess the dynamic costs of dumping on the U.S. steel industry have shown that, under certain conditions, the welfare effects of dumping can be negative if the dynamic costs are taken into account.\textsuperscript{9}

Obviously, individuals do not base their views of dumping on such calculations, but the many Americans hurt by dumping during the

\textsuperscript{8} See, for example, Gary Huffbauer and Erika Wada, “Steel: Look Who’ll Hit the Jackpot,” \textit{The Washington Post} (22 June 1999), A17.

past several decades no doubt understand the long-term costs that dumping can have.

At the very least, the existence of long-term costs muddies the water about the so-called benefits of dumping, especially because the net cost of trade remedies is relatively small. According to a study by the U.S. International Trade Commission, the removal of outstanding U.S. remedies in 1991 would have resulted in a net welfare gain of $1.6 billion dollars, roughly 0.03 percent of GDP.

Though lost wages are the most obvious long-term cost of dumping, there are other potential sources of economic losses. Widespread and long-lasting dumping can lead to the outright demise of an industry. The loss of an industry, in turn, can permanently damage the domestic supplier base, thereby precluding competition in potentially lucrative products. Absent domestic competition in an industry, overseas manufacturers may be able to exercise undue influence on retailers to keep prices high. If the industry is characterized by high levels of research and development, the loss could lead to a net reduction in national R&D spending, potentially slowing productivity growth.

Ideological opponents of antidumping either ignore such costs or minimize their importance. They argue that labor and capital resources released from the industry in question can be re-deployed gainfully and profitably elsewhere in the economy. Predatory pricing is unlikely to occur and, even if it does occur, domestic prices are unlikely to rise once domestic competition is eliminated. Thus, because long-term costs are insignificant, the short-term gains from dumping are reason enough for allowing dumping to occur unimpeded. The unimportance of long-term costs is ultimately the linchpin of arguments against antidumping. If long-term costs can be shown to exist, the case against antidumping laws is dramatically undercut.

This study is an attempt to demonstrate that dumping, far from being a short-term phenomenon, can have long-lasting economic consequences. This report is the second in a series of studies by the Economic Strategy Institute that explores the impact of global market distortions on the U.S. economy. The first, *Leveling the Playing Field: Antidumping and the U.S. Steel Industry*, found that the loss of high-
wage jobs due to dumping in U.S. steel markets could be larger than the “net welfare gains” that accrue from allowing dumping to occur.

This present study, which focuses on the U.S. consumer electronics industry, will examine other sources of economic and social loss.

The story of the U.S. consumer electronics industry is well suited for this undertaking. It was the subject of a fierce and prolonged dumping campaign. Though dumping cases were filed, a series of puzzling events resulted in such long delays that only a small fraction of levied duties were collected more than a decade and a half after the original case was filed. The laws were applied so poorly that, by the time relief came, all but one U.S.-owned firm in the industry had either been bankrupted or sold to European, Japanese, and Korean firms.

In Chapter 2, the development of the U.S. consumer electronics industry is traced using trade, output and employment data from the late 1950s to the present. The U.S. industry, dominant through the early 1960s, is no longer a major player. The globalization of the industry is discussed in Chapter 3, with a focus on the market forces and government policies that shaped the development and migration of the industry. Particular attention is paid to how Japanese government policies and business practices accelerated the decline of the U.S. television industry and, in the process, spawned a host of market distorting practices in other countries and regions. After a brief description of the U.S. government’s half-hearted attempt to deal with Japanese dumping, the economic costs of the dumping are discussed in Chapter 4. Conclusions and lessons are offered in Chapter 5.
The U.S. consumer electronics industry traces its lineage back to Thomas Edison’s invention of the phonograph in 1877. For the next eighty years, U.S. firms were major players in the global industry and the source of many innovations.

By the late 1950s, the U.S. consumer electronics industry (SIC 3651), mainly audio and video equipment (see Appendix Exhibit A.1), was a significant U.S. industry, but not a dominant one. In 1958, for example, U.S. producers of consumer electronics employed 66,500 employees, about as much as the periodical publishing industry and the upholstered household furniture industry. The consumer electronics industry employed one percent of the workforce of durable goods manufacturers and was responsible for $1.5 billion in shipments. Productivity, measured in terms of value added per employee, was $8,932 per worker, slightly higher than the manufacturing average.

The U.S. consumer electronics industry was dependent largely on the domestic market in 1958 – only 4.3 percent of industry shipments went to foreign countries that year. Imports were only a small part of the U.S. market, accounting for only 1.6 percent of apparent domestic consumption. The industry ran a trade surplus of $45 million in 1958, but that would prove to be the last trade surplus it was to enjoy in the twentieth century.

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10 Apparent consumption is equal to shipments plus imports minus exports. The data in this paragraph is from the Annual Survey of Manufacturers.
The next decade saw a rapid growth in import penetration, largely the result of imports from Japan. By 1969, import penetration was 22.7 percent, and the trade deficit was more than $1 billion dollars. By 1996, imports were 75 percent of apparent consumption. In 1998, the trade deficit for SIC 3651 was $14.6 billion (see Exhibit 2.1).

As import penetration grew, value added, as well as employment, in the domestic industry stagnated. Industry value-added fluctuated between $15 billion and $29 billion annually from 1973 to 1996, even as industry shipments grew to $115 billion in 1995. The ratio of imports to value-added skyrocketed from 0.04 in 1958 to 8.2 in 1996, while the ratio of value-added to apparent consumption declined precipitously.

Employment in the industry peaked in 1966 at 130,000. During the subsequent thirty years, the industry shed 100,000 employees. Job losses were particularly severe from 1966 to 1970, when industry employment declined 31 percent; and from 1978 to 1987, when the recession, increased outsourcing, and the closure of major production
facilities coincided with a decline in industry employment from 77,000 jobs to 31,000 jobs. By comparison, the periodical publishing and the upholstered household furniture industries, which employed as many workers as the consumer electronics industry in 1958, now employ 120,000 and 88,000 people, respectively.

Exhibit 2.2 Ratios of U.S. Imports to Value Added and of Value Added to Apparent Consumption, 1958-1998.


Job cuts in 1987 alone, which cost the industry 31 percent of its employees, coincided with declining wages. In prior years, industry wages had closely tracked the average for manufacturing industries as a whole. Yet hourly wages paid by the industry fell from $10.48 in 1986 to $8.02 in 1987, putting the industry’s wages roughly twenty-four percent less than the manufacturing average.
The rise in import penetration had a dramatic impact on U.S. manufacturers of consumer electronics. In an effort to remain competitive, U.S. manufacturers began outsourcing more of their production to Japan and other Asian countries, as well as to Mexico. First, U.S. firms began importing parts, before moving on to subassemblies and ultimately to finished products. Many companies abandoned product sectors where competition was fierce and production unprofitable. Several of them went out of business or were purchased by producers based in Europe or Japan.

The case of the U.S. television industry is the best-documented example of this contraction. U.S. television manufacturers were especially hard hit by the onslaught of Japanese competition. From 1968 to 1976, the number of U.S. firms in the television business declined from twenty-eight to six, with only the largest producers, such as Zenith, General Electric, and RCA, remaining independent. Despite the rapid decline of the U.S. industry, U.S.-owned brands held about fifty percent of the retail market for color televisions as late as 1986, matching the share of domestic production in apparent consumption.

By 1990, the ownership situation had changed dramatically. Only one U.S.-owned producer, Zenith, remained, and it accounted for only thirteen percent of the U.S. market (France’s Thomson Electronics...
had purchased the GE and RCA brands in 1987.) Japanese- and European-owned brands each accounted for thirty-five percent of the color television market.


In 1995, LG Electronics, a member of one of South Korea’s largest industrial conglomerates and a former supplier of radios to Zenith, purchased a controlling share of Zenith, thereby completing the transfer of the U.S. television manufacturing industry out of U.S. hands. Following in the footsteps of many of its U.S. predecessors, the Glenview, Illinois firm filed for bankruptcy on August 23, 1999, and will be completely owned by LG Electronics once the bankruptcy reorganization is approved. Zenith, which now produces many of its televisions in Mexico, aims to remake itself as a sales, marketing and technology company.

The U.S. industry, therefore, is now a shadow of itself, having gone from being a world leader to a niche producer that relies on imports and foreign affiliates for the production of many consumer electronic products. Under pressure from imports, and lacking a strong domestic supplier base, the U.S. industry was not even a player in the booming markets for VCRs and consumer-oriented digital audio equipment.

Today, U.S.-owned manufacturers are no longer a force in the television manufacturing industry, but they do maintain the capacity to innovate. Even during the onslaught by Japanese manufacturers, royalties from patents developed by RCA’s David Sarnoff Research Center were generating $150 million annually. Ironically, despite government-supported and expensive efforts by Japanese and European manufacturers to develop high-definition television (HDTV), the core digital technology of that next-generation product was developed in 1991 by Woo Paik, a Korean-American working for General Instrument’s VideoCipher division. The U.S. consumer electronics industry, which had begun with Edison’s invention in 1877, had come full circle.

The digital future of consumer electronics provides an opening for U.S. firms to reenter the consumer electronics market, as does the expanding market for multimedia interactive systems, spurred by the explosive growth of the Internet. U.S. computer, communications, and software firms are, after all, extremely competitive.

However, that renaissance, if it occurs, appears unlikely to reverse the demise of the U.S. television industry. Paralleling the U.S. industry’s failure to commercialize VCR technology, the development of HDTV’s core broadcasting technology is unlikely to result in a major U.S. presence in the production of HDTV. When the first digital-format HDTVs appeared on the shelves of U.S. stores in late 1998, they appeared under the nameplates of Mitsubishi, Samsung, Panasonic, Pioneer, Sony, and Philips, all non-U.S. brands. If the U.S. consumer

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14 Sarah Schaefer, “Putting the Digital in HDTV,” USA Today (17 November 1997), 21E.

15 Multimedia is defined as the combination of audio, video, computer, communication, and software in a single interactive system.

16 Timothy Somheil, “TV or DTV?” Appliance (1 December 1998).
electronics industry is to rise again, it will have to be on the backs of the computer, software, and communications industries.
Global economic history is rich with stories of rising and declining industries. In many cases, the decline in one industry has been brought about by the rise of another industry born from some emerging technology. The rise of the railroads in nineteenth-century America spelled doom for the canals that had been the lifeblood of American commerce. The rise of the internal combustion engine relegated the horse and carriage to the service of tourists and urban romantics. More recently, the rapid spread of personal computers has forever altered the growth path of the typewriter industry.

In similar fashion, firms from one country can threaten the competitive advantage of firms or groups of firms in another country. The development of a more efficient production process or a more favorable cost structure is often the driving force behind such competitive realignments. For instance, the implementation of total quality management and just-in-time inventory control enabled producers in Japan to gain ground on their U.S. counterparts in many industries. Lower Japanese labor costs and an undervalued yen also played a role in supporting Japanese competitiveness.

Similarly, lower labor costs in many developing countries have led to a substantial and ongoing shift in apparel production from the United States to Mexico, China, and other developing countries.

Though technological change, changes in relative efficiency, and differences in factor costs are at the root of changes in competitiveness within and across countries, they are not the only factors at work. Governments can, and have, played an important role in determining the competitive balance within industries and across national boundaries.
Governments can play that role indirectly in several ways, by: (1) funding basic research in universities and government laboratories; (2) serving as a source of demand for a product, thereby enabling manufacturers to achieve economies of scale; and (3) on an even more generic level, preventing the excessive concentration of market power by enforcing antitrust legislation and maintaining low trade barriers. Such an indirect government role enables individual firms and their import competition to determine the competitive balance in the domestic market.

On the other hand, governments can play a more direct role in enhancing the competitiveness of domestic firms, via industrial policies – defined as government guidance and support of industry. For example, instead of funding basic, pre-competitive research, a government can actively support product-specific research by providing subsidies and by encouraging cooperation among national firms. A government can also protect a domestic industry by discouraging imports or by preventing foreign companies from entering the domestic market via foreign direct investment. Alternatively, authorities can entice a foreign company to relocate its operations by combining high tariffs with investment incentives. Governments can encourage collusion instead of competition, and can establish incentives that reward the creation of capacity without regard to potential economic costs. When a government engages in heavy-handed industrial policies, it can play a major role in determining the competitive outcomes in domestic and foreign markets.

As the previous chapter documented, the U.S. and global consumer electronics industries have experienced dramatic changes in technology, market leadership, and the location of production over the years. Though market-based factors such as improved production processes and factor costs definitely shaped the development of the global industry in many important ways, government industrial policies in various countries also shaped competitive outcomes at the expense of the U.S. consumer electronics industry.

Globalization of the Industry

Like their U.S. competitors, the European consumer electronics industry was driven by innovation. In fact, several early advances in
solid-state physics emerged from European laboratories.\textsuperscript{17} The European market was dominated primarily by continental firms until the onset of Japanese competition in the 1970s, and European producers were able to maintain a manufacturing presence in Europe. By 1989, European output was double that of the United States, and unlike their U.S. counterparts, European firms were players in the VCR market, though their main strength remained in televisions.\textsuperscript{18}

In Japan, consumer electronics production was fairly modest, but began to emerge in the mid-1950s as both a driving force and a beneficiary of the domestic economy’s postwar takeoff. Japan’s manufacturing capacity and technical abilities expanded quickly, and it was ultimately Japanese firms, not American firms, that embraced and popularized the transistor radio. Japanese companies also scored early successes by manufacturing small-screen, monochrome televisions in the mid-1960s and by utilizing programmable equipment to manufacture consumer electronics.\textsuperscript{19}

By 1968, Japanese output had expanded twenty-fivefold, and by the early 1970s, the Japanese industry was responsible for one-third of home electrical appliance production.\textsuperscript{20} Japan’s major electronics firms came to dominate the global VCR and home audio markets as well, and by 1985, Japan was producing more consumer electronics than the United States, Western Europe, and the Newly Industrialized Economies combined.\textsuperscript{21}


\textsuperscript{21} Hart, 60.
The story was similar, though later in unfolding, in Korea and Taiwan. Korea produced its first transistor radio in 1958, but the industry did not flourish until the 1970s. During the 1950s and 1960s, the government followed import substitution policies.\textsuperscript{22} High levels of protection coupled with low wages attracted investment from American and then from Japanese firms, but the Korean industry consisted primarily of assembly operations and was largely oriented toward the domestic market. During the 1970s, output and exports expanded an astounding 44 percent and 53 percent per year, respectively. Shipments grew a hundredfold from the mid-1960s to 1987, supporting electronic firms at most of the major chaebol.\textsuperscript{23} Like European and Japanese producers, Korean firms were able to make the transition into VCRs, but have tended to rely on parts and components produced in Japan.\textsuperscript{24}

The Taiwanese consumer electronics industry did not begin to flourish until the late 1960s. The government began implementing import substitution policies for certain products in 1963, but the industry’s initial development spurt was the result of the FDI.\textsuperscript{25} During the mid-1960s, foreign companies were attracted in part by low wage rates, which were about one-tenth the level of American wage rates at that time.\textsuperscript{26} By the early 1970s, such companies as Motorola, General Instrument, Admiral Overseas, RCA, Ford-Philco, Zenith, and Shenbao, a joint venture with Sony and Sharp, had assembly operations in Taiwan.\textsuperscript{27} Domestic players grew in importance during the 1970s and


\textsuperscript{23} Chaebol are large, family-owned conglomerates akin to Japan’s prewar zaibatsu.

\textsuperscript{24} Kang, 96.

\textsuperscript{25} Cheng-Tian Kuo, \textit{Global Competitiveness and Industrial Growth in Taiwan and the Philippines} (Pittsburgh: University of Pittsburgh Press, 1995).

\textsuperscript{26} Kuo, 232n.

\textsuperscript{27} Kuo, 172 and 233n.
1980s, as did electronics production and trade.\textsuperscript{28} By 1985, Taiwan had become the world’s fifth largest producer and exporter of consumer electronics.\textsuperscript{29}

Today, European, Japanese, and Korean firms that own and operate manufacturing facilities at home and abroad dominate the consumer electronics industry. Increasingly, the manufacture of several product categories has moved to developing countries in Asia that sought to emulate Japan’s success. Mexico, due to the maquiladora program and proximity to the large U.S. market, has also become a major exporter of finished products, although the country imports many key parts and components from the United States and Asia.

Looking at the development of the global consumer electronics industry over the past several decades, it is clear that there has been a tendency among major players, regardless of the nationality of ownership, to locate labor-intensive products and production processes in developing countries with lower labor costs. This migration of production began in the late 1940s, when U.S. firms took advantage of lower labor costs in Japan by outsourcing finished products, such as radios and other low-value products. By the mid-1960s, both U.S. and Japanese firms were investing in, and outsourcing production to, firms in Korea and other industrializing Asian economies. European firms also increased their Asian purchases and investments as well.

By the late 1980s and early 1990s, European and Japanese firms, as well as firms based in industrialized Asian countries, were increasingly relying on production networks that reached into Southeast Asia, China, and Mexico. For example, in 1989, foreign direct investment in Thailand’s fledgling consumer electronics industry was almost double the cumulative investment level of the previous two-and-

\textsuperscript{28} By 1988, radios, televisions, and telecommunications equipment made up five percent of Taiwanese exports. Calculated from data in Marcus Noland, Pacific Developing Countries: Prospects for the Future (Institute for International Economics, 1990), 32-33.

\textsuperscript{29} Dieter Ernst and David O’Conner, Competing in the Electronics Industry—The Experience of Newly Industrializing Economies (Paris: Organization for Economic Cooperation and Development, 1992), 113.
a-half decades.\footnote{See Dieter Ernst and David O’Conner, 148.} By the early 1990s, Malaysia had emerged as a major manufacturing base for Japanese brands of VCRs. As of 1998, Thomson Multimedia Asia, the French firm’s main Asian affiliate, had 14,000 employees spread across twelve countries in Asia.\footnote{“Thomson to Close Kulim Plant due to Stiff Competition,” \textit{The New Straits Times} (7 February 1999), 16.}

This dispersion of production has had a dramatic impact on U.S. trade flows. By 1998, Mexico had replaced Japan as the main source of U.S. imports of television receiver and video monitors. In 1989, Japan’s exports of consumer electronics products to the U.S. market totaled $4.9 billion, but by 1998, U.S. imports of consumer electronics from Japan had declined to $2.8 billion, and both Mexico and China had surpassed Japan in the rankings. These shifts are illustrated in Exhibit 3.1.

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>4,929.0</td>
<td>6,058.7</td>
<td>17.2%</td>
</tr>
<tr>
<td>Korea</td>
<td>1,555.8</td>
<td>4,019.8</td>
<td>22.1%</td>
</tr>
<tr>
<td>Mexico</td>
<td>1,447.7</td>
<td>2,771.0</td>
<td>-6.2%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>1,157.6</td>
<td>2,329.4</td>
<td>16.9%</td>
</tr>
<tr>
<td>Singapore</td>
<td>683.4</td>
<td>822.7</td>
<td>66.4%</td>
</tr>
<tr>
<td>China</td>
<td>482.8</td>
<td>482.8</td>
<td>0.0%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>473.2</td>
<td>473.2</td>
<td>0.0%</td>
</tr>
<tr>
<td>Canada</td>
<td>822.7</td>
<td>822.7</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>252.3</td>
<td>252.3</td>
<td>0.0%</td>
</tr>
<tr>
<td>Thailand</td>
<td>241.7</td>
<td>241.7</td>
<td>0.0%</td>
</tr>
<tr>
<td>Brazil</td>
<td>104.2</td>
<td>104.2</td>
<td>0.0%</td>
</tr>
<tr>
<td>Philippines</td>
<td>103.4</td>
<td>103.4</td>
<td>0.0%</td>
</tr>
<tr>
<td>U.K.</td>
<td>102.0</td>
<td>102.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Germany</td>
<td>101.6</td>
<td>101.6</td>
<td>0.0%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>61.1</td>
<td>61.1</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
| Source: U.S. International Trade Commission

There are several reasons to expect such a shift in production to occur. As noted, it is well known that wages in developing countries are much lower than in developed countries such as the United States, Japan, and the countries of Europe. That disparity exerts a strong pull on advanced-country firms to outsource or to establish manufacturing facilities to supply products and components requiring labor-intensive production. The consumer electronics industry is not the only industry to experience that phenomenon. Semiconductor manufacturers based in developed countries have shifted labor-intensive operations such as packaging to low-wage countries.

Another explanation for the shift in production is the product cycle hypothesis (PCH) put forth by Raymond Vernon in 1966. The hypothesis holds that firms that first commercialize a product have the field to themselves until the production process becomes standardized, at

which point competition, especially from low-wage countries, becomes more of a threat. That threat compels the commercializing firm to invest abroad in order to preempt competition. A variation of the PCH holds that oligopolistic firms behaving strategically will follow their competitors that invest abroad in order to preserve the competitive balance in the global industry.

Companies may also establish assembly facilities to cope with external factors, such as fluctuating exchange rates and protection in export markets. Surveys of Japanese companies during the 1980s indicate that both of those factors led to an expansion of export-oriented, consumer electronics production facilities into Asia.\textsuperscript{33}

**The Role of Policy**

Though factors such as those mentioned above undoubtedly played an important role in shaping the development of the global consumer electronics industry, as well as the fate of the U.S. industry, they do not tell the entire story. For various reasons, many governments have deemed consumer electronics as a strategic industry worthy of targeted development policies. Those policies have introduced severe market distortions in domestic markets, distortions that inevitably spilled over into export markets and set in motion a chain of policy actions and reactions. The U.S. government, which did not treat the domestic industry as a strategic one, applied remedies haphazardly, belatedly, and ineffectively, and was in many ways responsible for the U.S. industry’s wrenching decline.

The initial source of market distortions in the global consumer electronics industry was Japan’s industrial policies. Those policies created an environment conducive to the rapid creation of capacity, the formation of cartels, and dumping. The creation of capacity was a natural outgrowth of the Japanese government’s pro-growth policies. The government aimed to provide as much capital as possible to innovative firms that were adding capacity in key industries. To

accomplish that goal, Japan’s Finance Ministry directed banks to lend at below-market rates to firms in industries selected by the Ministry of International Trade and Industry, such as consumer electronics. 34

Again, the television industry yields the most telling evidence of how market distortions affected the consumer electronics industry. Japan’s industrial policies led to rapid growth of television production capacity, outstripping the domestic market’s ability to consume. As a result of that glut, wholesalers and retailers cut prices dramatically. 35 In a normal market environment, the outcome of such a capacity glut would have been bankruptcies, the exit of certain firms from the domestic industry, mergers and/or higher unemployment. However, market forces and excess competition were viewed suspiciously in Japan, and another solution was found.

To deal with the “problem,” Japan’s domestic manufacturers and distributors formed a price cartel in 1956, known as the Home Electric Appliance Market Stabilization Council. The cartel drew the attention of the government antitrust watchdog, the Japan Fair Trade Commission, which decided that the Council had indeed violated Japan’s antimonopoly law. However, the FTC ruling did not disband the cartel, nor did it seek to halt price fixing activities. 36

That case, in effect, gave the green light to the formation of additional cartels in the consumer electronics industry, as did the subsequent erosion of the FTC’s powers. In 1957, Japan passed the Electronics Industry Promotion Special Measures Law, which directed MITI to set production, quantity, and cost targets in the electronics


36 Schwartzman, p. 80; also Pat Choate, Agents of Influence (New York: Alfred A. Knopf, 1990), 78-81.
industry and enabled MITI to authorize cartels.\textsuperscript{37} Other laws passed at that time severely weakened Japanese antitrust laws, providing broad latitude for domestic firms to collude, especially in promoted industries.\textsuperscript{38}

In the altered antitrust environment, television-related cartels seemed to flourish in Japan.\textsuperscript{39} In addition to the market stabilization council, manufacturers formed a hierarchy of cartels, including the Tenth-Day Group, the Television Study Group, the MD Group, the Palace Preparatory Group, the Palace Group, and the Okura Group, the last of which was reserved for company presidents. Through these cartels, manufacturers regulated output, prices, inventories, and retail and wholesale margins for televisions.\textsuperscript{40} There is also evidence that the cartels restricted competition in radios, tape recorders, and other consumer electronics products.\textsuperscript{41}

A price cartel can only be effective in a market protected from imports. Otherwise, the high prices charged by the cartel would invite import competition, which should, in theory, drive prices down. Japan’s television market was kept virtually import-free by tariff and nontariff barriers. Tariffs in Japan were high, ranging from twenty to thirty percent, until the late 1960s. Even if the tariff hurdle was overcome, the distribution system proved almost impossible to penetrate. Television manufacturers had come to control the distribution system, enabling


\textsuperscript{39} In 1966, Japan’s FTC filed another case against all the major producers except Sony, but that case ended without any real change in the cartel’s behavior. See Yamamura, 182.

\textsuperscript{40} See Schwartzman, 81-9; Choate, 78-81; and Yamamura and Vandenberg, 253-7.

\textsuperscript{41} See Schwartzman, 87 and 89.
them to prevent most distributors and retailers from handling foreign products.\footnote{Through loans, liberal trade credits, stock ownership, occasional boycotts, and an array of rebates, the manufacturers came to control the troublesome retailers and wholesalers that had vigorously cut prices during the mid 1950s. See Yamamura, 180-1.}

When those ramparts were breached, the government stepped in. Zenith, for example, tried selling into Japan in 1962, through the C. Itoh trading company, but MITI refused to allocate the necessary foreign exchange for the purchase. Safety inspectors harassed imports while MITI pressed the leading chains not to distribute Zenith products too aggressively.\footnote{See Michael Dertouzous, et al., 224; also Choate, 79-80.}

The combination of a cartelized industry and protected home market had predictable consequences. There were no new entrants in the domestic market after 1960. Imports were nonexistent, comprising one percent of the market as late as 1980,\footnote{See Yamamura, 180.} and they did not rise demonstrably until Japanese manufacturers imported finished product from their affiliates in developing Asia. Retail price competition was virtually eliminated, even though prices in Japan were up to two times higher than for comparable products in world markets. When those price differentials were finally reported in the Japanese press, a housewife organization organized a boycott of television sets in 1967.\footnote{See Yamamura and Vandenberg, 259.}

With production rising rapidly, Japanese consumer electronics firms began dumping product into the United States and Europe. For example, at the time of the housewife boycott, the ex-factory price for a set to be sold in Japan was 150,000 yen, while the average price for a set bound for the U.S. market was a mere 65,000 yen. Japanese exports to the U.S. market exploded. Japan’s market share for black-and-white televisions rose from 0.6 percent in 1962 to 27 percent in 1972, and the Japanese import share of the U.S. color television market also expanded.
rapidly, rising from 2.6 percent in 1967 to 11 percent in 1971 and 19 percent in 1976.

That export drive was aided by yet another set of cartels that helped the companies coordinate their export plans: the Japanese Machinery Export Cartel, the Television Export Council, and the Television Export Examination Committee. Through the former, MITI set agreed-upon “check prices” with the television industry, which set a price floor for U.S. exports. However, every Japanese exporter undercut that minimum price by illegally funneling kickbacks to U.S. merchandisers through offshore banks.

In order to prevent Japanese companies from competing among themselves in the U.S. market, the companies established the “five-company rule” limiting the number of U.S. customers to which each company could sell. Another rule ensured that Japanese makers made all their market share gains at the expense of American producers, not other Japanese firms. The export of transistor radios was similarly coordinated through the price coordination efforts of the TransistorExport Examination Committee and subsidiary bodies. Radio exporters also operated under the restraints of a five-company rule.

Once entrenched in the United States, Matsushita, the strongest cartel member, began to arm-twist U.S. retailers in a manner reminiscent of the Japanese industry’s manhandling of discounting Japanese retailers in the 1950s. In 1988, Panasonic Co., the U.S. subsidiary of Japan’s Matsushita Electric Industrial Co., allegedly implemented a vertical price-fixing scheme in which U.S. retailers were threatened with a loss of supply if they failed to raise prices by an average of five-to-ten percent. The products covered included camcorders, stereo equipment, and VCRs, a product for which Matsushita’s U.S. market share was forty percent. Panasonic’s president is said to have pressured retailers to

46 See Yamamura and Vandenberg, 256; also Choate, 79-81.

47 See Yamamura and Vandenberg, 259, 261-3; also Schwartzman, Chapter 6; also Choate, 80-81.

48 See Schwartzman, 93-4.
comply. In a memo, one of the company’s vice presidents urged close monitoring efforts to prevent “chaos in the marketplace.”

Though many U.S. retailers were willing participants, Service Merchandise Co. refused to go along and informed antitrust officials in New York. Panasonic settled a case brought by the attorneys general of New York and Maryland, in January 1989, for $16 million, plus $2 million to cover the cost of reimbursing the settlement. Three months later, Matsushita Electric of America hired its first American president and chief executive officer.⁴⁹

As noted in Chapter 2, the surge in exports drove many U.S. firms out of the industry. The threat of antidumping action ultimately led many of Japan’s major producers to invest in assembly operations in the United States, either via greenfield investments or by purchasing existing U.S. companies.

In addition to severely weakening competitors in the United States, Japan’s success in penetrating advanced-country markets had two other major impacts on the global industry. First, European governments implemented a range of market-distorting measures aimed specifically at preserving ownership and employment in the continent’s consumer electronics industry. Policies included the implementation of a Euro-standard, restrictive licensing arrangements, de facto local-content requirements, and even quotas.⁵⁰ That managed competition regime led to higher prices in Europe and enabled local firms to remain competitive in Europe, with Philips and Thomson ranking among the top five.⁵¹


⁵¹ Nokia, Grundig, and Bosch maintain a substantial presence as well. See John Zysman and Michael Borrus, From Failure to Fortune? European Electronics in the Changing World Economy, BRIE Working Paper #62, 1994, 10-1. For the discussion of higher European prices, see Tyson, 224-9.
Nevertheless, the top-two consumer electronics producers in Europe are Japanese, there is a considerable Asian manufacturing presence on the continent, and European firms rely on production facilities outside Europe to service non-European markets.

Second, other Asian countries, starting with Korea, sought to emulate Japan’s success. Like Tokyo, Seoul enacted laws to boost investment and output in the industry, including the Electronic Industry Promotion Law of 1969. Like Japan, the government provided R&D subsidies, tax exemptions, preferential finance, and high degrees of protection. Tariffs in the 1960s ranged from seventy-to eighty-percent. Though their tariffs were reduced substantially during the 1970s and 1980s, the Korean market remained far from open. As late as 1985, the nominal tariff on consumer electronics products in Korea was forty percent, but the effective tariff rate was much higher due to import bans on certain finished products. Thus, the three big Korean electronic firms were able to charge monopoly prices domestically, up to forty percent higher than export prices. In the words of one Korean scholar, “The domestic market thus served as a ‘cash cow’ for the Korean electronics industry, providing it with a substantial financial base for its ventures into international markets.”

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52 See Kang, 85.


55 See Bark, 3.
As in Japan, the combination of a closed home market and investment incentives produced capacity levels that could not be sustained by the domestic market. An export drive ensued, fueled by preferential trade finance, favorable tax treatment, and an undervalued exchange rate.\(^{56}\) Korean exports took off and, by 1988, Korea’s share of the global consumer electronics market was fifteen percent, second only to Japan.

Unlike Korea, which prohibited inward FDI in finished consumer electronics production, the next wave of consumer electronics-producing countries in Asia undertook a policy of attracting FDI with investment incentives. In Taiwan’s case, foreign investors initially were courted with incentives superior to those available to domestic firms. Once foreign-owned companies and joint ventures became a part of the landscape, the government conditioned expansion on export performance.\(^{57}\) The industry was protected by tariffs and import bans on certain products, and the industry association was given broad latitude to license imports and to coordinate production and prices.\(^{58}\) Similar policies were followed by Singapore and Hong Kong, and later by Malaysia and Thailand. Governments in the region also have played an important role in maximizing the flow of foreign technology and know-how into their economies.\(^{59}\) The result has been the creation of a vibrant electronics industry in developing Asia, with production geared toward exporting to advanced-country markets.

**Assessing the Role of Policy**


57 See Kuo, 182 and 184.

58 See Kuo, 176 and 189.

Clearly, market forces had an important impact on the U.S. industry’s demise. Even without competition from Japan, there would have been some migration of production due to wide disparities in labor costs faced by U.S. and Asian firms. Indeed, the record shows that U.S. firms purchased parts, components, and low-tech electronic products even before the onset of Japanese competition. The record also shows that Japanese firms during the mid-1970s developed a quality advantage over U.S. firms. American companies also made some strategic mistakes, such as the delay in utilizing automatic insertion equipment and the decision to use transistors in their monochrome products produced in Asia, but not in their color products made in the United States. In short, Japan and other countries would have gained market share even without cartels, closed markets, and other distortions.

Yet it is clear that foreign government policy was also a driving force in the demise of the U.S. consumer electronics industry. Japan’s industrial policies and weak enforcement of antitrust laws created a sanctuary domestic market that produced substantial profits for Japanese producers. Those profits sustained massive dumping in the U.S. market, which translated into huge market share gains for Japanese firms and a weakened market position for U.S. firms. Extreme cost pressures also accelerated U.S. dependence on NIE producers, and likely weakened U.S. management’s ability to upgrade domestic production facilities.

The success of Japanese policies also encouraged a crop of imitators in Asia. Korea, which created a sanctuary market, promoted exports, and relied on domestic conglomerates, hued most closely to the Japan model. Other governments in the region relied more on foreign capital, but they also distorted markets with high tariffs in order to promote capacity expansion and exports. In fact, Japanese FDI was initially drawn to the region by high tariffs, which enabled consumer electronics producers to garner windfall profits analogous to those in Japan. The end-result was the creation of an environment that deterred U.S. investment in the mass production of consumer electronics and

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60 See Hart, 61.

weakened the U.S. industry’s ability to compete in the manufacture of promising products, such as the VCR.

The intersection of policy and market forces, therefore, was a dangerous one for the U.S. consumer electronics industry, leaving it increasingly vulnerable to Asian and European competitors. Faced with such competitive pressures for as far as the eye could see, U.S. producers did the logical thing: they either liquidated or sold their businesses to overseas buyers. The buyers came almost exclusively from policy-distorted markets in Europe and Asia. Flush with cash and facing limits on exports to the U.S. market, Japanese firms had a strong incentive to buy U.S. firms and to construct U.S.-based production facilities. Korean and Taiwanese firms ultimately followed the trail blazed by Japan. European players, their businesses intact due to government policies, felt it necessary to purchase well-known U.S. brands and facilities as a defensive strategy against Asian competitors.62

The efforts of European governments to manage competition preserved a European role in the consumer electronics industry, but did not halt the migration of electronics production to Japan or, subsequently, to developing countries. In this sense, the outcome in Europe more closely resembles what might have transpired had Japan and others not distorted markets in the first place.

U.S. government policies also played a role in shaping the global electronics industry. Washington’s policies, and their economic cost, will be assessed in the next chapter.

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Chapter 4:
The Slow U.S. Response, and its Costs

The U.S. government has a number of options for dealing with import surges resulting from dumping, subsidies, or outright collusion. If imports are sold below the cost of production or below their price in the home market, antidumping laws can be used to restore competitive balance.\footnote{See Mastel, 89.} If import prices are affected by foreign subsidies, Washington can turn to countervailing duty rules. If foreign collusion results in either predatory pricing or price gouging, antitrust laws are the appropriate policy tool. If the domestic industry is besieged by a surge of fairly traded imports, U.S. industries can seek relief through Section 201, known as the escape clause.\footnote{Greg Mastel, \textit{Section 201: Revitalizing the Forgotten Trade Law} (Washington, DC: Center for National Policy, 1999), 1-2.}

By nearly all accounts, the U.S. government’s response to the challenges posed by Japanese television imports was inadequate.\footnote{See, for example, Choate, 104-5; Schwartzman; 181-2; Hart, 60; and James E. Millstein, “Decline in the Color Television Industry,” in John Zysman and Laura Tyson, ed., \textit{American Industry in International Competition} (Ithaca, NY: Cornell University Press, 1983), 130.} At first blush, that conclusion may seem counterintuitive, given the large number of government entities that have been involved. From the early 1960s to the early 1980s, the Commerce Department, the Treasury Department, the Labor Department, the Tariff Commission, and the International Trade Commission participated in literally dozens of cases involving television imports. The federal court system and state governments also were drawn into the fray.

Yet, federal efforts failed miserably to provide relief for the U.S. television industry until it was too late. Relief, when it came, rewarded
Japanese manufacturers for their dumping transgressions and provided little incentive for U.S. firms to bolster the competitiveness of domestic facilities. At the same time, U.S. tax and tariff policy also tilted the playing field against U.S. production by encouraging U.S. manufacturers to shift production capacity to low-wage countries.  

The loss of the industry was a costly one. Dynamic costs of exiting the industry were high. Employment levels declined, most of the people who lost jobs were likely re-employed at lower wages, and lost opportunities in subsequent product development have likely cost the U.S. electronics industry billions of dollars in revenues and led to less job creation in the consumer electronics industry than would otherwise have been the case.

The U.S. Response

The inadequacy of the U.S. response was most glaring in the television industry. Despite the number of cases and the number of agencies involved, only three strands of policy action are deserving of mention: the antidumping petition of 1968, the antitrust litigation that commenced in 1970, and the orderly marketing agreements beginning in 1977.

The antidumping case alleged that Japanese firms were selling televisions below their cost in the home market. Because relevant information was slow to materialize, the Treasury Department, which was responsible for investigating the charges, took three years to render an official verdict. Treasury decided Japanese firms were dumping, even though its investigation was conducted on the basis of the check prices – the rebate scheme was not detected until the early 1980s.

Amazingly, it took the department seven years to come up with the dumping margin, a delay caused largely by Japanese stonewalling. Nevertheless, the levies resulting from seven years of dumping were staggering, almost $400 million, a sum that excluded all dumping that had occurred prior to 1972.

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66 See Millstein, 112-6. Millstein cites the foreign tax credit, tax deferral provisions, and the value-added tariff provisions as hastening the production shifting of U.S. firms.

67 Choate, 82-3.
After much legal wrangling and diplomatic stonewalling, and despite prodding by the Congress, only $16 million was ever collected, an amount less than the state price-fixing case settled in 1989. In 1979, a dismayed Congress took the responsibility of administering antidumping laws away from the Treasury and gave it to the Department of Commerce.

The decision in the antitrust proceedings was another setback to the U.S. television industry. Like the antidumping petition, the antitrust case dragged on for more than a decade. Moreover, it never made it to trial. Originally known as the Japanese Electronic Products Antitrust Litigation, and later as Matsushita et al. Vs. Zenith Radio et al., the case alleged that Japanese firms had conspired to reduce prices in the United States in order to eliminate competitors. After ruling much evidence inadmissible, the lower court judge offered a summary judgment in favor of the defendants in 1975. The Court of Appeals for the Third Circuit reversed part of the district court’s ruling in 1983, and the case went to the Supreme Court. In 1986, the Supreme Court, though it did not question the lower court’s finding of a cartel, reversed the circuit court’s ruling, exonerating the remaining Japanese defendants. It ruled, in essence, that the defendants had no motive to engage in predatory pricing because they could not have hoped to recoup predatory losses by earning outsized profits.

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68 See Choate, Chapter 6; also Yamamura and Vandenberg, 263-4; Schwartzman, Chapter 7.

69 See Choate, Chapter 6; also Yamamura and Vandenberg, 264-5. For a more detailed examination, see Schwartzman, Chapters 1, 8, and 9.

70 See Schwartzman, 157-64. The vote was five to four in favor of reversing the Appeals Court decision. The minority opinion would have allowed a trial.
With the antitrust and antidumping processes dragging on, the domestic industry hemorrhaging jobs, and the Congress becoming increasingly uneasy, the Carter Administration implemented a series of OMAs covering television imports from Japan, Korea, and Taiwan.\(^71\)

The OMA with Japan succeeded in stopping the import surge from factories in Japan, but it did not improve the condition of the U.S. domestic industry. For one, relief was too late in coming. Japanese television producers had already achieved substantial gains in the U.S. market. By 1976, import share in the U.S. market was 33 percent for color televisions and 75 percent for black-and-white sets. Color sets came almost exclusively from Japan, while Japanese and Japanese-owned plants in Asia supplied demand for monochrome sets.

Second, the OMAs merely bought time for U.S. producers to transfer additional facilities abroad. Because, OMAs did not explicitly aim to counter the market-distorting practices that led to dumping in the first place, there was no assurance that the distorting behavior would not resume once the arrangement ended. Thus, there was little incentive for U.S. firms to undertake expensive upgrading of U.S.-based capacity. Under those circumstances, it made more sense to manufacture in low-wage countries. Consequently, U.S. employment in the color television production industry, including production at foreign affiliates with operations in the United States, declined from 27,000 in 1976 to 17,500 in 1982.\(^72\)

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\(^71\) The OMA with Japan limited the country’s exporters to 1.56 million complete sets and 0.19 million incomplete sets per year. Under the terms of the OMA with Taiwan, Taiwanese exporters were limited to 0.5 million complete sets and 0.918 million subassemblies. Korea was allowed to export 0.289 million units of complete and incomplete television sets combined. See *Color Television Receivers from The Republic of Korea and Taiwan*, USITC Publication 1514 (April 1984), A-4.

\(^72\) *Color Television Receivers from the Republic of Korea and Taiwan*, A-23; also *Television Receiving Sets from Japan*, USITC Publication 1153 (June 1981), A-48.
Ironically, the OMAs did not have the adverse consumer impacts that normally accrue to such policies. Competition by producers in other countries prevented prices from rising, so consumer and efficiency losses were very small.\(^\text{73}\)

Nevertheless, the OMAs facilitated Japanese acquisitions of U.S. producers and further expansion in Asia. Japanese firms subsequently were able to consolidate their grip on the U.S. market with transplant sales and shipments from Japanese affiliates in Asia. In short, a strong case can be made that, despite the temporary relief provided by the OMAs, the accord accelerated the U.S. industry’s demise.

The OMAs were not a complete disaster, however. Japan’s investment in the United States has helped to keep U.S. employment levels in the industry from falling even lower. Moreover, the Asian recipients of FDI from Japan and the United States have become more technologically sophisticated competitors in some consumer products and intermediate components. Along with European firms, they have provided some competitive balance to Japan in the industry. That additional competition ensured that the OMA with Japan did not lead to higher consumer prices.\(^\text{74}\)

**Antidumping – The Better Way**

That silver lining notwithstanding, U.S. producers and the U.S. economy as a whole would have benefited in several ways from the prompt implementation of antidumping relief. U.S. firms would have benefited from pro-competitive effects of remedies. The timely implementation of duties would have punished Japanese firms for their

\(^{73}\) See Morris E. Morkre and David G. Tarr, *Effects of Restrictions on United States Imports: Five Case Studies and Theory* (Washington, DC: Federal Trade Commission, June 1980), 197. They conclude that “Since the OMA on color TV’s from Japan was circumvented and exchange rate changes diminished its restrictiveness, it imposed no measurable costs nor generated no measurable benefits.”

\(^{74}\) See Morkre and Tarr, 76-7. The stability of television prices is even more surprising given the yen’s appreciation and generally high U.S. inflation levels during the late 1970s.
dumping. The remedy would have also weakened Japan’s firms financially and encouraged them to dump less or, at the very least, to dump less severely. Providing relief would have also encouraged Japan’s imitators to adopt different policies. Though it is doubtful that Asian firms would have abandoned efforts to promote electronics exports, the successful application of duties would have encouraged governments in the region to liberalize their electronics markets more hastily. In fact, some scholars believe that rising trade friction with the United States encouraged both Seoul and Taipei to liberalize imports in the electronics industry.\footnote{See Kuo, 184-5; also Nam, 175. Korea, however, maintained its ban of finished Japanese products until only recently.}

The U.S. economy as a whole would have gained, because duties would have transferred the rents earned by Japanese producers under the OMA to the U.S. Treasury. Consumers would have been no worse off, because antidumping duties could have achieved the same quantity and price outcome for Japanese imports.

The logic for this conclusion is illustrated in Exhibit 4.1 below, which depicts a remedy that leads prices to rise from $P_u$ to $P_f$.\footnote{Exhibit 4.1 and the accompanying analysis treat domestic and imported products as perfect substitutes.} (The subscript “$u$” denotes prices and quantities associated with dumping, while the subscript “$f$” denotes prices and quantities if imports are not dumped.) In the comparative-static framework of analysis, both an OMA remedy that limits imports to quantity $Q' \_f$ minus $Q_f$ and an antidumping remedy equal to $P_f$ minus $P_u$ produce the same quantity and price outcomes for consumers. Consumers consume quantity $Q' \_f$ at price $P_f$. With the OMA, however, rectangle “$C$” is a rent earned by the dumpers, while under an antidumping order, area “$C$” would flow to the U.S. Treasury. From the standpoint of net U.S. welfare, the antidumping remedy is clearly superior to an OMA.
The comparative-static framework’s core insight, that the short-term cost of antidumping remedies to consumers and consuming industries (A+B+C+D) is greater than the gains from such remedies to producers and the Treasury (A+C), can not be challenged. Yet, the utility of framework is limited by its inability to capture other economic costs. For instance, the framework assumes a frictionless redeployment of labor and capital resources, but experience suggests that resources are not necessarily reemployed right away.\textsuperscript{77} The framework also ignores longer-term costs, such as foregone profits and cash flow associated with the development of related products, the potential for higher prices in consumer markets, foregone domestic research and development expenditures, and the adverse trade effects. These potential short- and long-term costs of dumping will be explored in the remainder of this chapter.

\textsuperscript{77} See Morkre and Tarr, 16-20, for a discussion of losses borne by domestic resources.
Costs of Losing the Consumer Electronics Industry

Lost Wages and Employment

One of the obvious costs of losing an industry are lost wages resulting from layoffs.\textsuperscript{78} Comparative-static analysis ignores those costs, assuming the employees within an industry are instantaneously reemployed. From 1966 to the early 1980s, a period of rising and high U.S. unemployment rates, the assumption of rapid reemployment clearly did not hold. From 1966, the year of peak employment in the U.S. consumer electronics industry, to 1982, the U.S. unemployment rate rose from 3.8 percent to 9.7 percent. The exhibit below, which illustrates the five-year-average unemployment rate, underscores the point that jobs were not easily found during the period of substantial job loss in the consumer electronics industry.

\textsuperscript{78}U.S. International Trade Commission, The Economic Effects of Significant U.S. Import Restraints, Phase I: Manufacturing, USITC Publication #2222 (October 1989), 2-3 to 2-4. “The loss in producers’ surplus … will underestimate the true loss caused by tariff elimination if workers are displaced involuntarily as a result of a rigid wage.”
If the cost of lost wages is taken into account, the conclusions that dumping always confers net economic benefits and that, conversely, antidumping and other remedies always produce net welfare losses, are called into question. One study of the U.S. steel industry by the U.S. International Trade Commission found that the inclusion of lost wages would have reduced the net welfare “loss” of combating dumping with a VRA in 1988 by twenty-eight percent. Another study of the steel industry estimated that potential wage losses from periodic dumping over several years could exceed cumulative comparative static welfare gains under certain conditions. Those results are driven by the fact that steelworkers who lose their jobs due to dumping tend to remain

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unemployed for several months before landing in jobs that pay lower wages.

Workers who lost their consumer electronics jobs also fared poorly, though wage losses were not as severe as in the steel industry. Data going back to the late 1950s indicates that, for the most part, wages in the consumer electronics industry tracked the private-sector average pretty closely, with only a small wage premium in the sector arising during the 1970s. Nevertheless, workers in the industry who lost their jobs experienced losses in wage income. One study of workers displaced for economic reasons during the 1979-to-1983 period found that workers from the electrical machinery industry (of which consumer electronics is a subset) were unemployed for a median period of 24 weeks, versus 46 weeks for the steel industry. Workers who had been reemployed when the survey was taken were working in jobs paying 5.6 percent less than their previous jobs, versus a 25.1 percent wage cut for steelworkers.81

Unfortunately, government surveys of the wage profile and unemployment duration for displaced workers only began in 1984.82 That survey, and subsequent ones, indicate that electronics workers faced higher rates of displacement than workers in the economy as a whole, and that reemployed workers during the early 1980s, when unemployment rates were rising, earned less than in their previous jobs. Since unemployment rates during the 1970s were increasing, the experience of laid-off workers probably reflects the experiences of their 1981-83 and 1983-85 cohorts. That is, displacement rates and wages losses were probably high. Though rising imports were not the sole


cause of those losses, given the dramatic rise in import share, it seems safe to say they were a major cause.


<table>
<thead>
<tr>
<th>Displacement Rate</th>
<th>Earnings in New Job</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Economy-wide</td>
</tr>
<tr>
<td>1981-83</td>
<td>9.0</td>
</tr>
<tr>
<td>1983-85</td>
<td>7.1</td>
</tr>
<tr>
<td>1985-87</td>
<td>6.5</td>
</tr>
<tr>
<td>1987-89</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Sources: Bureau of Labor Statistics.

There have been longer-term impacts on wages as well. As noted in Chapter 2, the consumer electronics jobs that remain in the United States no longer pay as much as the manufacturing average. Wages and employment levels declined sharply in 1987, reflecting, among other things, layoffs and lower wages implemented by Zenith, which was fighting to return to profitability; layoffs by GE, which had been shedding employees as a result of its purchase of RCA’s television manufacturing assets; and the increased use of Mexican production bases by U.S. firms and U.S. affiliates of Japanese firms.\(^{83}\) As of 1996, the hourly wages of production workers at consumer electronics facilities in the United States were about eighty percent of the manufacturing average.

The timely use of existing trade law by the U.S. government would not have completely halted job losses in the industry. Productivity increases due to technological advances, as well as the allure of low-wage countries for labor-intensive processes, would have ensured some displacement over time. Clearly, however, dumping that arose from overseas market distortions caused income losses for U.S. workers above and beyond what would have occurred in a less distorted environment.

**Lower Capital Expenditures**

Dumping can also reduce investment in an economy, adversely affecting future economic growth. For example, if capital equipment with economic value is idled due to bankruptcy, an economy’s potential to grow is reduced. Also, if manufacturers believe that dumping will occur in the future, there is an incentive to invest less in the economy targeted by dumpers. Companies faced with such prospects may choose to invest in other economies, or to invest domestically in projects less vulnerable to dumping.

The rising import competition and the general decline of U.S. ownership in the consumer electronics industry suggest that premature
erosion of capital stock may have occurred. The number of television producers in the United States fell from about twenty in the late 1960s to thirteen by 1976. Subsequently, several remaining U.S. producers shuttered U.S. production facilities and replaced them with facilities in Mexico and developing Asia. U.S. producers of other consumer electronics goods likely behaved in a similar fashion. Clearly, some of the investment embodied in such facilities was retired prematurely, at a cost to the U.S. economy.

Investment in new plants and equipment also suffered initially, but seems to have recovered somewhat. According to data from the Annual Survey of Manufacturers, the rate of investment in consumer electronics rose sharply during the early days of Japanese import competition, only to decline for about a decade. There was a distinct slowdown of investment in U.S. facilities during the 1970s, measured in terms of real, new capital expenditures per employee, and that slowdown surely reflected the U.S. industry’s poor outlook during the 1966-to-1978 period. A sharp pickup in investment occurred during the late 1970s, soon after the first OMA went into effect, but not until 1979 did the industry’s real investment per employee surpass the level achieved in 1966.

Subsequently, European, Japanese, and other Asian companies, spurred by the OMAs, frequently purchased exiting U.S. firms and continued investing in U.S. facilities. Investment in the industry by those foreign affiliates, and by niche U.S. players such as Bose and Harman Industries, has kept investment rates trending upward since the late 1970s. New investment declined sharply during the late 1980s, consistent with the decision by many firms to expand capacity in Mexico.
Assessing the economy-wide impact of lost investment in the consumer electronics industry is more complicated. After all, investors could have invested in other U.S. industries, in treasury securities, or in foreign production facilities.

However, given the growing reliance of U.S. manufacturers on overseas production facilities, investments likely flowed abroad. That conjecture is confirmed by U.S. government data. According to the annual publication *Foreign Direct Investment Abroad* for 1983, consumer electronics affiliates in developing Asian and Latin American countries employed 45,000 workers, listed $1.2 billion in assets, and were responsible for $820 million in U.S. consumer electronics imports.\(^4\) In 1986, the year before the RCA and GE brand names were

\(^4\) *U.S. Direct Investment Abroad – Operations of U.S. Parent Companies and Their Foreign Affiliates, Revised 1983 Estimates* (Washington, DC: U.S. Department of Commerce, 1986), Table 12, Table 4, and Table 19, respectively. The
sold to non-U.S. firms, affiliates in developing Asian and Latin American countries employed 51,800 workers, held $1.6 billion in assets, and were responsible for more than $1 billion in imports. In other words, at least a portion of foregone U.S. investment was shifted overseas.

**Foregone Sales Revenues**

Given the proliferation of industrial policies, dumped imports, closed overseas markets, and a hostile domestic policy environment, the decision by U.S. producers to exit the consumer electronics industry was probably rational. Yet, by deciding to exit an industry that enjoyed an assured stream of consumer demand and potentially lucrative products, U.S. manufacturers cut themselves off from a huge revenue stream.

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Department of Commerce’s breakdown includes firms in the communications industry, so it is not a perfect match.

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85 *U.S. Direct Investment Abroad – Operations of U.S. Parent Companies and Their Foreign Affiliates, Revised 1986 Estimates* (Washington, DC: U.S. Department of Commerce, 1989), Table 12, Table 4, and Table 19, respectively. After 1986, the Asian and Latin American production facilities sold by GE would not have been counted as a foreign affiliate of a U.S. firm.
The Avoidance of Double Counting

One could argue that foregone sales revenue is implicitly counted in the discussion of lost wages, lost investment, and lost R&D. In the short run, that is definitely not the case, because the comparative static framework assumes a frictionless redeployment of resources. To see why, it is necessary to refer to Exhibit 4.1. The area under the supply curve represents the domestic industry’s various expenditures, including wages, consumption of fixed capital, amortized R&D, and other inputs. If dumping lowers domestic shipments from $Q_f$ to $Q_u$, the area under the domestic supply curve corresponding to lost shipments ($Q_f$ minus $Q_u$) is assumed to be redeployed elsewhere in the economy. Therefore, foregone shipments in the short term do not translate into lost wages, lost investment, and lost R&D. As the time frame under discussion lengthens, the distinction becomes less clear. On the one hand, the subsequent shift to foreign ownership beginning in the late 1960s, in and of itself, did not affect the volume of domestic shipments. However, that shift coincided with lower investment and research expenditures in the U.S. industry (see Exhibit 4.5 above and the discussion of R&D below). This pattern demonstrates that dumping had some impact on investment and R&D independent of its effect on domestic shipments. The foregone sales in other industries, due to lost manufacturing expertise on the U.S. side, are also not counted in any of the other categories under discussion. True, employment, investment, and R&D considerations are mentioned in the paragraph dealing with the revenue-generating potential of VCR and HDTV production, but those impacts are not counted elsewhere in the text.
The losses began with VCRs in the early 1970s. Even though the technology underlying the VCR was developed in the United States, U.S. companies such as Ampex and RCA, their efforts hampered by manufacturing difficulties or financing problems, were unable to commercialize mass-produced versions of the product successfully. Japanese companies ended up dominating the VCR market and, by 1981, were making more VCRs in Japan than televisions. From 1978 to 1990, VCR production in Japan totaled more than 105 billion dollars (in 1990 dollars), with billions of dollars more produced by Japanese companies in Europe and Asia.

U.S. losses did not stop with the VCR. With U.S. firms on the sidelines, Japanese firms innovated and prospered with compact disk players, the Walkman, camcorders, and television-based games such as Sony Playstation, which alone generated forty percent of Sony’s profits in 1998. As the table below shows, consumer electronics equipment and related products and services still generate a high share of revenues for many of Japan’s largest firms, even though a significant share of equipment is now produced outside Japan. U.S. firms could have achieved billions of dollars in revenues had they been even minor players in one or more of those product categories.

Moreover, the cost of exiting the industry, in terms of sales revenue, will likely grow in the future. For instance, the market for high-definition television is expected to reach $380 billion during the next decade alone but no U.S. firm is currently among the main players in HDTV, even though a U.S. firm set the standard for other producers to follow.


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86 See Dertouzous, et al., 226-228.
87 See Hart, 65.
89 See Fulford, 156.
<table>
<thead>
<tr>
<th>Sales of Consumer Electronics</th>
<th>Electronics Share of Net Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sony Corporation*</td>
<td>41,937</td>
</tr>
<tr>
<td>Matsushita Electric</td>
<td>16,295</td>
</tr>
<tr>
<td>Hitachi</td>
<td>7,669</td>
</tr>
<tr>
<td>Victor Company of Japan</td>
<td>4,834</td>
</tr>
<tr>
<td>SANYO Electric Co., LTD</td>
<td>3,591</td>
</tr>
<tr>
<td>Aiwa Co. LTD</td>
<td>2,963</td>
</tr>
<tr>
<td>Fuji Electric Co. LTD</td>
<td>2,570</td>
</tr>
</tbody>
</table>

*Includes sales of games

The U.S. inability to remain a force in the consumer electronics industry also had costs for other U.S. industries. For example, U.S. firms once dominated the professional broadcast equipment industry, but they saw their position of strength fade as Japanese consumer electronics producers translated their manufacturing know-how into success in that market. The import share of apparent consumption rose to forty percent in 1980 and to fifty-eight percent in 1995, though the shift from analog to digital products has enabled some U.S. firms to do well in that market.

U.S. manufacturing expertise in the areas of miniaturization and high-volume production has suffered as well.

In addition, the consumer electronics industry’s loss of market share during the 1970s and 1980s had a major impact on the U.S. semiconductor industry. Consumer electronics producers are major users of semiconductors, but Japanese electronics firms relied almost exclusively on Japanese-made semiconductors until the late 1980s.

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90 Changes in the SIC and trade classification systems, as well as other problems, hampered efforts to document market share changes in the broadcast equipment industry consistently. Data sources for these calculations were the U.S. International Trade Commission (http://dataweb.usitc.gov/), Current Industrial Reports (MA36M), U.S. Commodity Exports and Imports Related to Output, 1981 and 1980, and the Annual Survey of Manufactures.

91 See Prestowitz, 143.
Thus, as U.S. electronics producers dropped out of the market, a major source of semiconductor demand dried up.

**Higher Prices**

The lack of domestic competitors leaves U.S. consumers and consuming industries vulnerable to future price hikes by the dominant firms. Though opponents of trade remedies often downplay the possibility of price gouging, history suggests that such concerns have merit. As noted earlier, once Japanese electronics firms had established a dominant position in the U.S. market, the largest of those firms attempted to limit price competition at the retail level.

Such concentration of production can have a damaging impact on domestic producers of downstream products. For example, Taiwanese firms, which dominate production of portable computers, spent $3 billion in 1998 to purchase thin-film-transistor liquid-crystal displays from Korean and Japanese firms, which dominate display production. Laptop producers and the government believed those high prices were the direct result of Taiwan’s lack of domestic LCD production capacity. In 1999, Korean LCD manufacturers drove home that vulnerability by diverting their output to Korean and Japanese laptop producers, leaving several Taiwanese producers high and dry. Taiwanese computer manufacturers are now investing more than $3 billion to enter the display industry.\(^{92}\)

Fortunately, the dearth of domestic production capacity in many consumer electronic products has not led to long-term price gouging in the United States, for three reasons. First, competition in consumer electronics has been robust, due to the decisions of European and developing-country firms and governments to promote consumer electronics. Also, as in the case of semiconductors, U.S. trade policy actions, such as antidumping, spurred production in other nations.\(^{93}\)

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Second, consumer protection in the United States is substantial, as Matsushita learned when it tried to manipulate retail prices of VCRs. Third, production advances have enabled manufacturers of consumer and industrial electronics alike to reduce prices substantially over the years.

**Foregone Research and Development Expenditures**

Research and development expenditures are important determinants of both corporate competitiveness and national prosperity. From the standpoint of a company, higher levels of R&D can produce innovations that enable the company to operate more efficiently and to develop new products. The success of new products leads to higher revenues, which supports even more R&D and better corporate performance over the long run.

From the standpoint of a country, R&D is beneficial because the technological advances that arise from such efforts improve efficiency and thus raise productivity. According to the U.S. Bureau of Labor Statistics, investment in R&D contributed about 0.2 percentage points to annual productivity growth between 1963 and 1992. 

Dumping can reduce R&D expenditures in three ways. First, it can reduce the U.S. industry’s ability to fund its research activities in the short run by reducing sales and profits. Companies with declining sales will be unable to sustain high research expenditures. Second, foreign-owned companies tend to perform more of their research at home. Thus, an ownership change can result in less U.S. R&D even if the level of shipments from U.S. plants remains unchanged. Third, over the long term, the large sectoral trade deficits that can result from dumping translate into slower growth by shifting resources out of an R&D-intensive sector into a less R&D-intensive sector.

By way of example, data from various dumping investigations carried out by the U.S. International Trade Commission suggest that

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Japanese, Korean, and Taiwanese-owned television producers carried out much less R&D in the United States than either U.S. or Dutch-owned firms. From 1976 to 1981, Japanese firms invested one dollar for every $19.86 invested by Dutch and U.S.-owned firms. The data also detail a general decline in U.S. R&D from 1976 to the 1983, even though sales of color televisions were trending upward during the period. Data from the National Science Board suggest that the decline continued during the late 1980s.

It is difficult to assess the economy-wide impact of declining R&D expenditures in the consumer electronics industry. The U.S. companies that exited the industry may have focused their R&D efforts elsewhere. It is clear, however, that had U.S. firms remained major players in the consumer electronics industry, the considerable growth in sales revenue could have financed substantial R&D activities in the consumer electronics industry and other industries as well.

**Trade Flows**

As this study was being written, during the summer of 1999, the United States was suffering record deficits in merchandise trade and goods-and-services trade. The U.S. trade deficit as a share of GDP has been approaching four percent of GDP, a level that has elicited concern from the IMF, (former) Treasury Secretary Robert Rubin, and Federal Reserve Board Chairman Alan Greenspan.


The deficit’s current rise is largely a macroeconomic phenomenon. The combination of rapid growth in the United States, relatively weak demand in the markets of several U.S. trading partners, currency depreciation associated with the Asian financial crisis, and the most recent rise in oil prices has led to a slowdown in U.S. exports and a pickup in imports.

Nevertheless, the United States is experiencing a substantial, structural trade deficit that would exist even if the macroeconomic variables were different. The structural deficit includes large trade shortfalls in petroleum, apparel, automobiles, and consumer electronics. Persistent sectoral trade deficits are quite normal and usually arise from differences in factor endowments, but the U.S. consumer electronics deficit is, in many ways, the result of foreign industrial policies and the U.S. government’s decision not to enforce its trade laws.

U.S. dependence on consumer electronics imports is responsible for $20 billion to $26 billion in sales each year, and those imports add $13 billion to $15 billion annually to the U.S. trade shortfall. With U.S. demand for consumer electronics expanding roughly 7.3 percent annually since 1958, it is hard to imagine the sector’s deficit not expanding even further in the future. The situation almost ensures that import surges elsewhere in the economy will produce more trade acrimony and a more contentious trade policy environment than would otherwise be the case.

Another potential cost of this sectoral deficit is that it puts downward pressure on the U.S. dollar exchange rate. If dumping in this industry resulted in a somewhat weaker dollar, then there has been a negative terms-of-trade impact on the U.S. economy. That is, it takes more U.S. exports to purchase a given number of imports. That cost was measured by the ITC and found to be even larger than the cost of lost wage income.99

The proper application of dumping laws would not have transformed the U.S. consumer electronics industry into a perennial

producer of trade surpluses. Nonetheless, it seems safe to say that a more effective use of trade laws to counter pervasive market distortions would have slowed the departure of U.S. producers and produced a less import-dependent U.S. consumer electronics industry than the one that exists today.

Overall Assessment

Foreign industrial policies, subsequent dumping in the U.S. consumer electronics market, and the U.S. government’s decision not to enforce its trade laws had economic costs beyond those reflected by the typical comparative static analysis. Those costs seemed highest from the early 1970s through the early 1980s, when the industry experienced lost wage income, stagnant investment levels, and declining R&D expenditures. True, many of those costs disappeared over time as U.S. labor and capital resources moved out of consumer electronics and into other industries. However, because that resource shift took place during a time of slow growth and high unemployment, it is hard to argue that resources were used productively immediately after they were released from the consumer electronics industry. In other words, the adjustment costs of exiting the industry were substantial and long lasting.

Even today, despite the low unemployment and general economic prosperity, some economic losses persist. American manufacturers will be cut off from much of the hundreds of billions of dollars in sales revenue generated by HDTV during the next decade, revenue that would have funded billions of dollars in future investment and R&D. The consumer electronics industry’s contribution to the U.S. trade deficit will also continue to have a variety of costs in the economic and political realms.

On the other hand, losses due to higher prices have not been a major issue. Though the declining U.S. presence in the industry seems to have encouraged one Japanese manufacturer to force retailers to charge higher prices, antitrust actions at the state level, competition from manufacturers based in Europe and Asia, and advances in manufacturing technology have kept consumer electronics prices relatively low.
### Exhibit 4.7 Assessment of the Dynamic Costs of Losing the Consumer Electronics Industry.

<table>
<thead>
<tr>
<th>Potential Costs</th>
<th>Assessment</th>
</tr>
</thead>
</table>
| Wages and Employment     | • High adjustment costs for displaced workers from 1970-85  
                          | • Declining employment in a growth industry  
                          | • Decline in relative hourly wage |
| Capital Expenditures     | • Premature erosion of capital stock during 1960s and 1970s  
                          | • Investment slump during 1966-78  
                          | • Investment generally rising during 1980-96 period; occasional weakness |
| Foregone Sales           | • Billions of dollars in lost sales (VCRs and other products)  
                          | • Losses accelerated Japanese competition in other industries  
                          | • Poorly positioned for next growth market ($380 bil. HDTV market) |
| Higher Prices            | • Matsushita's attempt to manipulate U.S. retailers failed  
                          | • Competition, state-driven antitrust actions, manufacturing advances have kept prices low |
| Foregone R&D             | • U.S.-based R&D activity declined during '70s and '80s  
                          | • Revenue stream could have funded substantial R&D efforts  
                          | • R&D likely shifted to other sectors over time |
| Structural Trade Deficit | • Probably larger than it should be  
                          | • Likely to grow, as import dependence remains high  
                          | • If it leads to depreciation, U.S. terms of trade are reduced |
Chapter 5: Conclusions

The argument against antidumping laws and other trade remedies available to counter market distortions ultimately rests on the allegation that such remedies hurt national economic welfare. Specifically, the comparative static framework of analysis holds that those remedies hurt domestic consumers and consuming industries more than they help domestic producers, their workers, and supplier industries.

However, when the costs and benefits of both producing and consuming entities are taken into account, the net welfare loss from antidumping and, conversely, the net welfare gains from allowing dumping to occur, are not large, relative to the overall economy. Thus, if it can be shown that dumping has other long-term costs not captured by this framework, the case against antidumping laws is substantially weakened.

To analyze that possibility, this study examined the U.S. consumer electronics industry, with a specific focus on the television industry. That sector vividly illustrates the impact that foreign industrial policies can have on an industry. Moreover, it also provides an instructive narrative of what can happen when U.S. trade laws are not applied in a timely manner. Most important for the purpose of this paper, the saga of the U.S. consumer electronics industry furnishes clues about whether long-term costs really exist.

The conclusions of the study are as follows:

A major U.S. manufacturing industry in the late 1950s, the U.S. consumer electronics industry today is a minor player in the large and growing U.S. market. During the industry’s heyday, it paid average wages, employed 130,000 workers, ran a trade surplus, and was largely U.S.-owned. Today, the industry pays below-average wages, employs about 30,000 workers, runs a large and growing trade deficit, and is largely foreign-owned. Though the U.S. ability to innovate remains, as
illustrated by the development of digital HDTV, the capacity to translate such success into market gains has been damaged, perhaps irreparably.

Both the invisible hand of market forces and the very visible hand of foreign industrial policies influenced the U.S. industry’s decline. Strategic errors by the U.S. industry clearly aided the rise of Japanese and other Asian competitors. Moreover, the allure of lower production costs in low-wage countries – initially Japan but eventually other Asian countries and Mexico – has exerted a constant pressure on U.S., European, and even Japanese manufacturers to relocate production of many key products. Thus, at least some of the changes experienced by the U.S. consumer electronics industry over the past several decades would have occurred regardless of the policy environment.

Foreign industrial and trade policies, cartel activities in Japan, and Washington’s poor enforcement of U.S. trade laws accelerated the U.S. industry’s decline. Tokyo’s mix of financial incentives, import protection, and weak antitrust enforcement enabled Japanese manufacturers of televisions and other consumer electronics products to dump heavily in the U.S. market while charging high prices at home. Though the U.S. industry filed a variety of trade cases during the 1960s and early 1970s, the U.S. government failed to enforce existing law vigorously, even when Japanese firms were found to be engaging in significant dumping and illegal activities. When the U.S. government finally did provide relief, it came in the form of orderly marketing agreements that encouraged remaining U.S. firms to relocate production in Asia and Mexico.

Japan’s aggressive targeting in the consumer electronics industry strongly influenced the shift of electronics production to Asia and Mexico. Japan’s success in the U.S. market encouraged sanctuary market strategies in the Korean and Taiwanese consumer electronics industries while encouraging western firms to invest in, and outsource from, other Asian countries. The resulting rise in Asian competition, as well as the threat of U.S. trade remedies and the strong yen, put pressure on Japanese producers to expand production in other developing countries, such as Malaysia, Thailand, and Mexico.

Trade protection affected the ownership of remaining assets in the U.S. consumer electronics industry. Ironically, the U.S. industry was
eventually bought out by companies from protected markets. Unable to see the light at the end of the tunnel, U.S. producers slowly exited from the consumer electronics industry. Firms from Japan, Europe, Korea, and Taiwan—countries with high levels of protection—either purchased U.S. television manufacturers or established greenfield operations in the United States. The U.S. government’s reliance on OMAs in the late 1970s encouraged the transfer of the U.S. industry into foreign hands.

The decline of the consumer electronic industry generated several long-term costs to the U.S. economy:

- Workers from the industry were laid off during a period of rising unemployment. Evidence suggests they were unemployed for a substantial period of time before being re-employed at lower wages. The consumer electronic jobs that remain in the United States now pay lower-than-average wages.

- U.S. investment suffered as well. Investment in the industry rose sharply during the early days of intense Japanese competition, but investment per employee stagnated during the late 1960s and 1970s as the industry was hemorrhaging jobs. Data on U.S. foreign direct investment suggest that at least some of this lost investment was diverted overseas rather than to other U.S. industries. Additional economic losses were incurred due to the premature obsolescence of capital stock.

- U.S. firms have foregone tens of billions of dollars in sales revenue by exiting the consumer electronics industry. U.S. companies have already missed out on sales of follow-on products such as VCRs, walkmen, CD-players, and game consoles. Worse, they are unlikely to be major players in the $380 billion market for HDTV sets. Even a ten percent share in global markets for these products could have sustained substantial employment and investment levels.

- Another cost of exiting the industry is foregone R&D expenditures. The sales revenue lost because of failure to produce many consumer electronic products translates directly into lower research expenditures. The change in ownership also reduced activity, because foreign companies carry out most of their research tasks in the home country. The net impact on the economy as a whole is difficult to assess, but it is clear that the
industry’s revenue stream could have sustained massive R&D efforts in the United States had U.S. firms remained major players.

- The large, perennial trade deficits resulting from the accelerated exit of American consumer electronics producers are another long-term cost to the U.S. economy. Because the United States relies so heavily on foreign production, it runs a $13 billion to $15 billion consumer electronics trade deficit that will remain large regardless of changes in macroeconomic variables. This and other structural deficits create added trade friction and may harm U.S. terms of trade.

- The decline of U.S. production capabilities in the consumer electronics industry has not led to higher U.S. prices. Nonetheless, Matsushita’s efforts during the late 1980s to compel U.S. retailers to charge higher prices suggest that the possibility of recoupment pricing by dumpers can not be ruled out.

Relevance for Today’s Trade Policy Debates

The lessons from the downsizing of the U.S. consumer electronics industry are extremely relevant to ongoing trade policy debates in the United States. In particular, the U.S. experience informs policy makers why the enforcement of U.S. trade laws is important and why antidumping laws should be maintained.

In the 1960s and 1970s, market distortions resulted in massive dumping in the U.S. market from countries whose own markets were protected from international competition. Washington refused to enforce U.S. antidumping law, deciding instead to impose OMAs six years after Japan was found to be dumping. The result of this inaction was a dramatic contraction of the consumer electronics industry at a time when U.S. consumption of such products was rising. U.S. firms in the industry were eventually purchased by companies based in protected markets. The loss of a major portion of the industry has had many lasting economic costs in terms of employment levels, wage income, capital investment, R&D expenditures, and an inability to compete in new products.
Parts of this story are reminiscent of the U.S. steel industry’s experience during the 1997-1999 import surge. Pervasive market distortions in global steel-producing countries led to massive steel dumping in the U.S. market. As with televisions and other consumer electronic products, the main culprit was Japan. The U.S. industry under attack was a global leader in a high fixed-cost industry. The Japanese industry responsible for the dumping was a creation of industrial policy. Import penetration in Japan was low due to an airtight domestic production cartel, vertical relationships that limit import competition, discriminatory government procurement, and subsidies. As with televisions, dumping emanated from different countries also characterized by market distortions.

There is, however, one important difference. Unlike the 1960s and 1970s, the U.S. government recently has enforced its trade laws against steel dumping. In June of 1999, the U.S. International Trade Commission unanimously found that less-than-fair-market-value sales by Japanese steel manufacturers were injuring or threatening to injure U.S. steel makers.\footnote{U.S. International Trade Commission, \textit{Certain Hot-rolled Steel Products from Japan: Determination and Views of the Commission}, USITC Publication No. 3202 (June 1999).} Though the U.S. producers, at the time of this writing, are still under pressure due to massive amounts of inventory that resulted from the dumping, the remedies put a halt to Japanese dumping.\footnote{Washington did set up voluntary restraint agreements, similar to OMAs, with firms from Brazil and Russia that were also found to be dumping. The U.S. industry has learned a lesson about the usefulness of such arrangements and has protested those agreements.} Four U.S. steel producers filed for bankruptcy as a result of the dumping, including one that tried selling into the Japanese market but was rebuffed. Nevertheless, the U.S. industry as a whole was spared the wrenching adjustments experienced by many U.S. consumer electronic firms.

The story of the U.S. consumer electronics industry is also relevant to ongoing efforts by Japan and other countries to weaken U.S. antidumping laws by revising the WTO’s antidumping agreement in the
upcoming round of multilateral trade negotiations. Given the market distortions that still exist in many Japanese industries, it is no surprise that Tokyo and governments from other heavily distorted markets seek a revision. The U.S. government’s position at the time of this writing is that a revision of the agreement is off the table. In light of the experience of U.S. consumer electronics firms and workers, this stance is entirely appropriate.

A Final Word

Chapter 1 suggested that American “tolerance” of antidumping laws was not necessarily the result of special interest politics, but a rational decision based on the realization that dumping’s short-term welfare benefits are potentially outweighed by dynamic economic and human costs. This study has shown that such costs not only exist, but they also can persist for quite some time. Those who argue disdainfully that Americans have been duped are not giving them enough credit.

True, the U.S. economy is resilient, and it ultimately adjusted to the loss of the consumer electronics industry. This does not mean that the economy is better off for ceding most of this industry to countries that distorted markets to grow at America’s expense.

Perhaps the most enduring cost of letting the consumer electronics industry wither was the encouragement of other nations to follow in Japan’s footsteps. The Asian crisis and Japan’s stagnation have taken some of the burnish off Japan’s earlier successes, but industrial policies have not gone away. Until they do, the United States is best served by maintaining its trade laws and using them when needed.
## Appendix:

### Exhibit A.1 – Products Included in SIC 3651, Household Audio and Video Equipment.

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<tr>
<th>Included Products</th>
<th>Included Products</th>
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<td>Amplifiers: radio, public address, or musical instrument</td>
<td>Phonographs, including coin-operated</td>
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<td>Audio recorders and players: automotive and household</td>
<td>Pickup heads, phonograph</td>
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<tr>
<td>Clock radio and telephone combinations</td>
<td>Pillows, stereo</td>
</tr>
<tr>
<td>Clock radios</td>
<td>Public address systems</td>
</tr>
<tr>
<td>Coin-operated phonographs</td>
<td>Radio and phonograph combinations</td>
</tr>
<tr>
<td>Disk players, compact</td>
<td>Radio receiving sets</td>
</tr>
<tr>
<td>Electronic kits for home assembly: radio and television receiving sets, and phonograph equipment</td>
<td>Recording machines, music and speech: except dictations and telephone answering machines</td>
</tr>
<tr>
<td>FM and AM tuners</td>
<td>Speaker systems</td>
</tr>
<tr>
<td>Home tape recorders: cassette, cartridge, and reel</td>
<td>Tape players, household</td>
</tr>
<tr>
<td>Juke boxes</td>
<td>Tape recorders, household</td>
</tr>
<tr>
<td>Loudspeakers, electrodynamic and magnetic</td>
<td>Television receiving sets</td>
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<tr>
<td>Microphones</td>
<td>Turntables, for phonographs</td>
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<tr>
<td>Music distribution apparatus, except records or tapes</td>
<td>Video-camera-audio recorders, household</td>
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<tr>
<td>Musical instrument amplifiers</td>
<td>Video cassette recorders/players</td>
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<td>Phonograph and radio combinations</td>
<td>Video triggers (remote control television devices)</td>
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<td>Phonograph turntables</td>
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**Exhibit A.3 – U.S. Consumer Electronics Industry**  
Trade and Apparent Consumption Data, Millions of Dollars,  

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<tr>
<th>Year</th>
<th>Imports (CIF)</th>
<th>Exports</th>
<th>Trade Balance</th>
<th>Apparent Consumption</th>
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Source: Electronic Industries Association of Japan.


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Source: Electronic Industries Association of Japan, International Monetary Fund.

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Exhibit A.4c – Japanese Consumer Electronics Industry

Production, Trade, and Apparent Consumption, Millions of Current Dollars, 1988-1996.

<table>
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<tr>
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Source: Electronic Industries Association of Japan, International Monetary Fund.
Bibliography


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**Short-Circuited**

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