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Semiconductor Chips and Automobile Parts

Starting in the presidency of George H. W. Bush and continuing through the presidency of Bill Clinton, the United States has used economic diplomacy to open Chinese markets—for telecommunications, agriculture, financial services, and other products. Throughout the 1990s, a major US diplomatic tool was to condition US approval for Chinese entry into the WTO on China's internal reforms. After China was granted permanent normal trade relations by the United States in 2000 and was admitted to the WTO in 2001, a period of relative calm ensued. Since many US firms are not satisfied that China is living up to its WTO obligations, it was only a matter of time before the United States launched complaints under the WTO's dispute settlement mechanism. Two cases involving access to Chinese merchandise markets have now been initiated: semiconductor chips and automobile parts.

Semiconductor Chips

On March 18, 2004, the George W. Bush administration filed the first US complaint against China in the WTO. The US government alleged that China provided preferential tax treatment for domestic semiconductor producers and that the preferences violated China's national treatment obligations.[1] China imposes a 17 percent value-added tax (VAT)

1. Foreign concerns about the Chinese internal tax system were expressed in the October 2001 WTO Working Party Report on China's WTO Accession; see paragraphs 19 to 21 and 167.

on semiconductors, both imported and domestic.[2] Both foreign and domestic firms are eligible for various export tax rebates, and these rebates do not appear to discriminate between locally owned and foreign-owned manufacturers.

But China did appear to discriminate against imported semiconductors destined for use in the domestic market. Discrimination would violate the national treatment principle embodied in Article III of the General Agreement on Tariffs and Trade (GATT).[3] According to the United States Trade Representative (USTR), domestic producers were refunded as much as 14 percent of the 17 percent VAT.[4]

After the United States filed its WTO case, the European Union, Japan, Mexico, and Taiwan asked to join the WTO consultations, the first stage under the WTO dispute settlement mechanism. The dispute was resolved in July 2004, a few days before the United States was prepared to initiate a WTO panel. Through bilateral negotiations, China agreed to eliminate VAT refunds for any new semiconductor products or manufacturers and to phase out semiconductor tax rebates in April 2005.[5] While the immediate dispute was resolved, similar disputes could well arise in the future as China seeks to strengthen its role as an information technology leader. An understanding of key issues in the semiconductor case is therefore important.

Role of the Semiconductor Industry Association

The US Semiconductor Industry Association (SIA), representing about 85 percent of the US semiconductor industry, was the driving force behind the WTO case (Howell et al. 2003). Investment in the Chinese domestic in-

2. According to the USTR, the VAT payments on imported chips cost US chip makers about $344 million in 2003. See Neil King Jr., "US Fights China's Tax on Imported Chips," *Asian Wall Street Journal,* March 19, 2004, A4.

3. GATT Article III states that each WTO member must provide foreign producers the same treatment given to domestic firms with respect to internal taxation and regulation. See WTO Analytical Index: General Agreement on Tariffs and Trade 1994, available at www.wto.org (accessed April 2004).

4. See USTR, press release, "US Files WTO Case Against China," March 18, 2004.

5. China also agreed to repeal, by October 2004, the VAT rebate eligible for integrated circuits designed in China but manufactured abroad. Semiconductor Manufacturing International Company (SMIC), China's largest semiconductor manufacturer, estimated that eliminating VAT rebates would lead to a decline in the company's profit margins by about $204 million annually. See USTR, press release, "US and China Resolve WTO Dispute Regarding China's Tax on Semiconductors," July 8, 2004; Sean Maloney, US-China Economic Relations, Testimony before the Senate Committee on Finance, US Senate, Washington, June 23, 2005; and "Elimination of Rebates Not Death Blow," *China Business Weekly,* July 27, 2004.

tegrated circuit industry totaled $3.6 billion from 2000 to 2002; the SIA attributed a substantial part of this to the discriminatory VAT policy.[6] The SIA claimed that the Chinese government used low-interest loans and cheap land to nurture its domestic semiconductor industry. The SIA feared that excessive investment would not only make China a serious rival in high-technology circuits but also create overcapacity and depress world semiconductor prices.[7]

China's Role in World Semiconductor Trade

China already has the world's third-largest domestic semiconductor market, closely following the United States and Japan (table 6.1 compares US electronics and information industry trade with China versus Japan).[8] Within China, domestic semiconductor purchases are expected to rise by 16 percent per year, exceeding Japan by 2010. Taken as a region, northeast Asia has already become the largest semiconductor market in the world, having surpassed the United States in 2001.[9]

Booming domestic computer and telecommunications sectors underpin the Chinese semiconductor market.[10] The Chinese share of the world integrated circuit sales jumped from under 3 percent in 1997 to 15 percent

6. Integrated circuits are an advanced version of semiconductors. The Chinese integrated circuit industry is expected to realize about $12 billion in sales annually by 2013.

7. See Anne Craib, Statement before the US-China Economic and Security Review Commission, US House of Representatives, Washington, February 5, 2004.

8. According to George Scalise, president of SIA, a cost differential of more than $1 billion separates the construction and operation of semiconductor plants in China versus the greater expense in the United States. Scalise estimates that 70 percent of the cost difference is due to Chinese tax benefits (such as the VAT rebate), 20 percent due to capital grants, and only 10 percent due to lower labor costs. He argues that since semiconductor plants are capital and technology intensive, even an 80 percent differential in wage rates translates into just a 10 percent difference in final costs. See George Scalise, China's High-Technology Development, Testimony before the US-China Economic and Security Review Commission, US Senate, Washington, April 21, 2005.

9. In 1997 the US semiconductor industry represented 33 percent of the world market, and the western Asia-Pacific region represented 22 percent. By 2001 northeast Asian countries, including China, represented close to 30 percent of the world market, while the United States dropped to about 25 percent. See Hatano (2003).

10. China already has the world's largest mobile phone market and second-largest personal computer market. China produces over 7 percent of global electronics equipment, and production is forecast to rise 11 percent annually. The SIA estimates the Chinese market for computer chips will grow at a rate of 21.5 percent each year until 2008. The US market has grown by 7.3 percent per year. See Chao and Sussman (2003) and Bruce Stokes, "China's High-Tech Challenge," *National Journal,* July 30, 2005.

Table 6.1 US electronics and information industry trade with China and Japan, 1997–2005 (billions of dollars)

Year	US imports[a]			US imports from China as share of total imports (percent)	US imports from Japan as share of total imports (percent)	US exports[b]			US exports to China as share of total exports (percent)	US exports to Japan as share of total exports (percent)
	China	Japan	World			China	Japan	World		
1997	16.4	54.6	261.3	6	21	3.9	17.0	219.8	2	8
1998	20.2	52.4	275.7	7	19	4.3	14.7	226.1	2	7
1999	25.1	56.7	308.2	8	18	4.2	15.2	229.8	2	7
2000	32.7	65.6	364.4	9	18	5.5	18.7	265.5	2	7
2001	33.3	49.8	313.7	11	16	6.7	15.6	229.5	3	7
2002	44.5	44.2	311.7	14	14	7.0	12.2	204.5	3	6
2003	58.3	44.2	325.5	18	14	8.2	11.4	202.2	4	6
2004	83.8	50.4	382.8	22	13	10.7	11.8	223.3	5	5
2005	95.6	48.6	462.8	21	10	9.8	10.4	240.2	4	4

a. Imports for consumption.
b. Domestic exports.

Note: Semiconductors account for a significant share of electronics and information industry trade.

Source: USITC Dataweb, 2006.

in 2002.[11] Chinese joint venture partnerships with foreign companies contribute a significant share of Chinese semiconductor revenues.[12] However, domestic Chinese production is still concentrated on low-end technology. To satisfy domestic demand, China currently imports at least 80 percent of the semiconductors used in electronics production. The Chinese government is trying to reduce its net import position and upgrade its domestic mix toward more sophisticated integrated circuit products, over a time horizon between 2005 and 2010.[13] As part of its plan, the Chinese government offers incentives to domestic and foreign companies through about 500 special investment zones.[14] The results are noteworthy. The US-based Agilent Technology, the world's largest testing gear maker, plans to invest $100 million in China.[15]

Chinese Tax Incentives

Among the many tax and trade incentives the Chinese government offers, some particularly benefit foreign firms. Most foreign firms are exempt from import quotas. A foreign-owned firm with advanced technology production techniques and equipment may qualify for technologically advanced enterprise status, the benefits of which include an initial five-year exemption from taxes, then a further five-year 50 percent reduction in

11. Correspondingly, Chinese integrated circuit exports to the United States increased by 628 percent, from $59 million in 1995 to $431 million in 2002, while US exports to China increased by 880 percent, from $165 million in 1995 to $1.6 billion in 2002. Based on data from the US Department of Commerce, International Trade Administration, Trade Compliance Center.

12. Most Chinese foundries (semiconductor plants that produce chips according to designs developed by specialized companies) have technology licensing agreements with leading semiconductor companies in Taiwan, the United States, Japan, and Europe. In 2004 the SIA estimated that foreign companies accounted for about 80 percent of the revenue of Chinese foundries. The SIA predicts that local Chinese companies will soon be designing semiconductors and driving world demand for advanced manufacturing capabilities. See testimony of George Scalise.

13. Currently China adds only about 5 percent of the value of chips sold. For example, Intel's plant in Shanghai does not make chips but rather tests and assembles chips from silicon wafers made in US plants. See Andres Higgins, "Power and Peril: America's Supremacy and Its Limits," *Wall Street Journal,* January 30, 2004.

14. Special investment zones include five special economic zones, 32 economic and technological development zones, 52 high-technology zones, 260 coastal open-city zones, and various technology zones in major cities (e.g., Shanghai Pudong New Area and Beijing Zhongguancun Science and Technology Zone).

15. See Godwin Chellam, "Agilent Tests China's Surging Electronics Demand," Reuters, January 26, 2005.

corporate income taxes (to a minimum 7.5 percent rate), and then an additional three-year one-third reduction, to a minimum 10 percent rate.[16]

Another incentive is the research and development (R&D) tax deduction. If a foreign company establishes an R&D center and increases its R&D outlays by 10 percent or more in two consecutive years, it may deduct 150 percent of its R&D expenses for corporate tax purposes. Local incentives are also available.[17] The Pudong New Area in Shanghai refunds land use fees and land grant fees for preapproved R&D centers and subsidizes property taxes under the Pudong Technology Development Fund.

Soon after the WTO dispute was resolved in April 2005, China focused on improving technology through increased R&D spending, announcing the creation of a new integrated circuit development fund starting in April 2005. While the exact size of the fund is unknown, the Chinese government expects R&D investment eventually to reach at least $1.3 billion annually.[18]

Evaluation

The United States has won the battle to end discriminatory VAT rates but could still lose the war over industrial subsidies: China could shift to other forms of public support, particularly for high-end integrated circuit production. Because the domestic Chinese semiconductor market is booming, and because many foreign firms are participating in the boom, the SIA might have a hard time both marshalling its members to oppose second-generation subsidies and demonstrating trade injury. However, if the time comes—say, five years hence—when Chinese semiconductor and other IT firms sell large quantities on world markets and depress prices,

16. Chinese tax benefits can be extended even longer by rolling the profits from an established company into a new company and starting the relief cycle anew.

17. See Chao and Sussman (2003). Similar tax incentives are given in the domestic car industry. See Richard McGregor, "China Acts to Shut Out Car Entrants," *Financial Times,* June 2, 2004.

18. The Chinese Ministry of Finance, Ministry of Information Industry, and the National Development and Reform Commission will jointly sponsor the integrated circuit fund. All semiconductor companies registered in China will be eligible to apply for funds up to 50 percent of the costs associated with the approved R&D projects. The new integrated circuit fund covers investments in the domestic chip industry at a level of about $120 million annually, personnel training of about $1.2 billion annually, income tax breaks, and a 1 percentage point discount on loans for new investments. See "Elimination of Rebates Not Death Blow," *China Business Weekly,* July 27, 2004; "China Industry: New Fund for Semiconductor Research," Economist Intelligence Unit, April 22, 2005; and SIA (2004).

it seems likely that safeguard and antidumping remedies will be invoked to slow the Chinese export push.[19]

Automobile Parts

On March 30, 2006, the Bush administration filed the second US complaint against China in the WTO, demanding better access to the booming Chinese automobile parts market. This time the European Union joined the United States. The Chinese auto parts market is already worth about $19 billion annually, according to Department of Commerce estimates, and US and EU firms obviously want to participate. In 2005 US auto parts exports to China were under $700 million.

In their submissions to the WTO, the United States and the European Union claimed that China's tariffs on auto parts not only exceeded the bound rates China agreed to in its WTO accession agreement but also violated the national treatment principle enunciated in Article III of the GATT.[20] The United States and the European Union cited two other provisions as well: Article 2 of the Trade-Related Investment Measures (TRIMs) agreement, which states that WTO members cannot impose an investment measure that violates the national treatment principle, and Article 3(1)(b) of the Agreement on Subsidies and Countervailing Measures (SCM agreement), which prohibits "subsidies contingent, whether solely or as one of several other conditions, upon the use of domestic over imported goods."

At issue is China's policy, implemented in 2005, that imposes higher tariffs on imported auto parts when the value of these parts amounts to 60 percent or more of the cost of a car made in China. This policy effectively increased tariffs on some auto parts from the prior range of 10 to 15 percent to a new level of 28 percent, the bound rate imposed on imported vehicles.[21] This increase arguably violates the national treatment provisions in GATT Article III and TRIMs. Also, by favoring domestic parts, it arguably violates the SCM agreement.

The United States further complained that China treats auto kits—either completely knocked down (CKD) or semi-knocked down (SKD)—as

19. Despite eliminating the VAT rebates, concerns about China's tax policies persist. According to the National Association of Manufacturers, US companies still complain of "export-based tax incentives and the discriminatory application of tax rates and rebates." See USTR (2005); and US State Department, press release, "China's Industrial Policies Conflict with WTO Rules," June 2, 2005.

20. Article III of the GATT requires WTO members to apply the same tax treatment to imports as they do to domestic products.

21. The 28 percent rate is imposed unless the finished vehicle meets China's local-content requirements.

finished autos for tariff purposes.[22] This treatment arguably violates the WTO Protocol on the Accession of the People's Republic of China, in which China committed to lower tariffs on knocked down kits.[23]

China has defended its current tariff system as a way of preventing domestic auto producers from avoiding the higher tariffs on fully constructed vehicles by importing whole cars piecemeal as parts. In our view, the Chinese defense will not prevail in the WTO. Indeed, it seems likely that, as with semiconductors, China will settle the auto parts case prior to full-blown litigation in the Dispute Settlement Body.

Evaluation

We predict that the resolution of the automobile parts case, like the semiconductors case, will convey the lesson that China will alter its trade policies when they demonstrably conflict with WTO obligations. However, the legal case will need to be persuasively articulated before China budges. We also predict that Chinese trade officials will prove highly creative in seeking out loopholes in the WTO framework, when those loopholes can be exploited to further China's industrial policies. If this forecast is correct, it suggests a continuing cat-and-mouse game between the United States and China, as China targets additional industries for rapid development using varied forms of public assistance.

22. A CKD kit contains all the individual parts required to assemble an auto. In an SKD kit, the main elements of an auto—for example, the chassis, transmission, engine, and body—are assembled to a greater degree, and thus the finished auto requires less work in the importing country.

23. See "U.S., EU Request WTO Consultations with China over Auto Tariffs," *Inside US Trade*, March 31, 2006.