Government-Business Strategies and Transatlantic Economic Relations:
Between Hegemony and High Technology

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PANEL SESSION 3D, 2:00 - 3:45PM
Transatlantic Economic Relations

EUSA International Conference 2003

Nashville, Tennessee, March 27–29

(This is a draft book chapter)

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American and European public and private sector organizations are involved in two of the highest-profile and highest-stake technology infrastructure projects ever undertaken: the advancement of (1) the third generation of wireless communications and the launch of wireless Internet (3G), and (2) the next generation of global navigation and satellite systems (GNSS). This chapter provides a comparative analysis of government-business strategies and transatlantic economic relations in examining these high-technology developments. Europe and the United States have very different starting positions: Europe benefits from a position as regional hegemon (unchallenged dominance) at home and a commanding international position in wireless cellular communications through the so-called Global System for Mobile communications (GSM), whereas the United States has enjoyed an extraordinary position as a global hegemon in satellite navigation through the Global Positioning System (GPS), a sector where Europe had virtually no presence in the 1990s. However, developments in the last decade could result in a new international division of labor, with the United States gaining a stronger position in the wireless sector and Europe gaining in the field of satellite navigation through its planned Galileo system.

A traditional assumption is that the European Union – for historical, structural and cultural reasons – is more prone to explicit, intentional and corporatist industrial policy than the United States, especially in leading-edge technologies. The United States is commonly associated with a more fragmented industrial policy and system of political economy (Bingham 1998; Nester 1997). The conventional wisdom would suggest that EU industrial policy considerations trump security considerations in the fields of satellite navigation and wireless Internet. The EU objectives to promote security-oriented considerations and the need for autonomous military capabilities represent no more than a mask for industrial policy interests. Moreover, it would suggest that American security considerations trump explicit industrial policy considerations in the field of satellite navigation, while its approach toward wireless Internet is the result of a free market policy tradition. It would also suggest that the US policy for satellite navigation is based on the fact that the United States assumes the major burden of security throughout the

world, whereas the European Union and Japan can spend more resources on coordinated industrial policies.

This chapter contends that collective support for high technology development largely depends on variation in relative economic and industrial competitiveness and that it better explains behavior and strategies for satellite navigation and wireless Internet in the European Union and the United States (Gourevitch 1986:56; Milner 1988; Grossman and Helpman 1994:835). The relative international positions of EU and US (and Japanese) economies and high-technology capabilities are different today compared to the 1980s and 1990s and have been strengthened in several areas, followed by EU and US industrial support that in many instances has become more global in orientation. The US approach to wireless Internet, influenced by a relatively weaker competitive position in industrial terms, has been aimed at creating a level-playing field and objecting to EU industrial policy. It eventually supported a free market orientation, but only after aggressive lobbying on the part of a number of industrial coalitions against the interests that promoted American CDMA technology (code division multiple access). Its approach to satellite navigation has been aimed at both supporting national security priorities and, through explicit industrial policy considerations, GPS as the dominant global standard.

While traditional industrial policy traditions still bear a role on behavior and strategies, the promotion of large-scale technology infrastructures in Europe and the United States cannot be primarily understood along the traditional distinctions of free trade versus protection, or of an Anglo-Saxon versus a European model of political economy (Milner and Yoffie 1989). The relative international competitiveness of economies, industries and firms, which shapes behavior and strategies for high technology play a more important role than traditional industrial policy traditions. In order to stimulate productivity, job creation, tax revenues and an information society, the EU and US industrial strategies for satellite navigation and wireless Internet have been aimed at promoting worldwide technology infrastructures and at gaining advantage through alliances with other centers for support for their industrial policy ambitions.

The two developments examined in this chapter provide interesting illustrations of government-business strategies within the transatlantic relationship. Technological progress implies that societies become increasingly dependent on large-scale

infrastructures for their functioning (such as transport, telecommunications, information technology and energy). The need for efficient technology infrastructures to support commerce, communication, mobility, and navigation – and the need to protect such public goods from unintentional and intentional interference – is clear to decision makers in the economic, political and military sectors. As markets and technologies evolve, the character of state support demanded by industry also changes, which in turn triggers a need to explore a more nuanced form of industry support that corresponds to the realities of global competition (Lembke 2002c).

Industrial and corporate strategies to control the dominant architectural standards in new cutting-edge technologies – within a context of a gradual move toward decentralized industrial structures, cross-national networks and alliances, and flexible regulatory policies – illustrate a new mode of competition and governance in relatively more global and liberalized industries, sometimes referred to as Wintelism (Borrus and Zysman 1997; Hart and Kim 2002a, 2002b). Changes in industrial strategies and government approaches may result in various formal and informal public-private constellations at the same time as further integration of the transatlantic economy may reduce the feasibility of certain policy options open to governments (Egan 2001; Smith 2001; Hocking and McGuire 2002). The relationships between equipment manufacturers, operators, software and content providers, and other industrial players, are also changing to new value chains and business structures in both the terrestrial wireless and satellite navigation sectors.

Governments clearly have a potentially important role to play in the development of high-technology infrastructures. From the perspective guiding this analysis, what may be called strategic liberalism, public actors try use a variety of tools to tweak the rules of the world economy and structure global competition in ways that enhance job creation and overall competitiveness in cutting-edge high-technology sectors. According to this perspective, the public sector should – in a prescriptive sense – influence the business environment by creating rules and procedures to foster healthy market competition, innovation capacity, the availability of competitively priced products and services, and productivity (competitiveness). In order to maximize general welfare (generate wealth, increase user choice and meet security priorities), political institutions may seek to elicit

the support of those actors and sectors on whom they rely on political support, for example by giving a positive boost to leading industrial actors with a strong record at home in competition with foreign industry that could siphon off their market share. They are likely to attempt to strengthen their institutional self-interests, regulatory powers, administrative capabilities, and to carry out policy as cost-effectively as possible, as a means to increase the ability to have influence and to promote general welfare

The major goal of a regional hegemon that also has a strong position in foreign markets is to maintain its dominant position and to prevent rival coalitions to challenge its leadership at home, and to ensure that foreign markets remain open in order to allow it to compete on a level-playing field in those markets. It is not common that a coalition of actors behind a certain technology gains a globally dominant position and is successful in maintaining global superiority over decades in a high-technology sector of vital economic and industrial importance. However, the US GPS coalition has been able to enjoy such a position. Satellite navigation systems in other regions depend on the GPS infrastructure and the United States should be expected to defend its global superiority. In addition, we should expect the European Union to protect its unchallenged dominance at home and leading position worldwide and to mount a challenge to the United States in satellite navigation in order to stimulate competition at international level and maximize welfare and independence at home.

It is plausible to argue that the EU strategy amounts to a sincere effort to strengthen Europe's strategic independence and political control over a critical infrastructure as a response to the need to reduce the transatlantic military gap and to American reluctance to share control over its own satellite navigation system. The promotion of an operationally independent European capability in satellite navigation could provide an instrument for strengthening the European Union as an international security actor (Ginsberg 2003). While US policy for satellite navigation represents an accidental spin-off from security-oriented policy, it has gradually evolved toward a more explicit industrial policy in light of mounting international competition and lucrative future world markets. The EU policy for wireless Internet and the US policy for satellite navigation have been to promote the acceptance and use of W–CDMA and GPS as the dominant world standards, respectively. The relative industrial-economic positions of

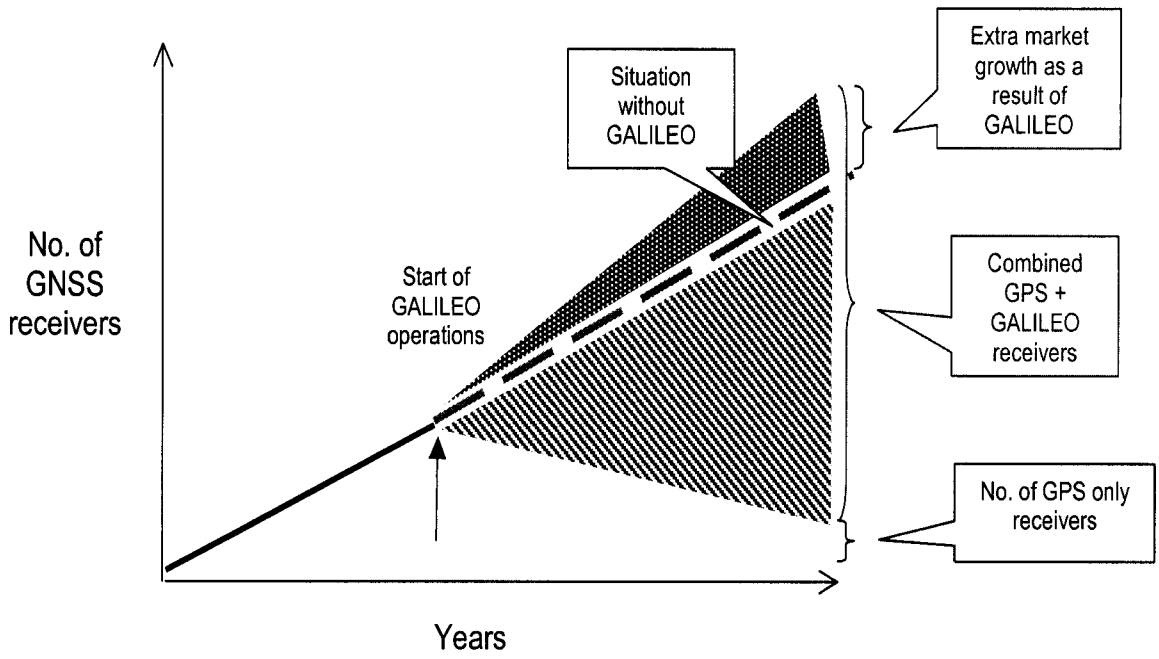
Europe and the United States and the associated policy realities of global competition must be included in the analysis in order to better understand variation in industrial strategies for high-technology industries.

Satellite Navigation and Transatlantic Relations

Policymakers and industrialists in Europe and the United States view global satellite navigation satellite systems (GNSS) as strategic information and communications infrastructures. The European satellite navigation and positioning program, Galileo, is the first pan-European public private partnership and the first project conducted jointly by the EU and the European Space Agency (ESA). Galileo, a civilian program under civilian control, will strengthen European sovereignty in safety-critical applications and reduce the dependence on third parties for telematics and transport infrastructure control and management (CEC 2001b, 2002a). It will deliver numerous mass-market services (personal communication, navigation and localization; vehicle systems etc.), professional services (oil and gas exploration, mining, timing, fleet management, surveillance, environment, land and precision survey, construction, space, etc.), and safety-of-life services (aviation, rail, maritime, emergency, surveillance, etc.). The European Union and the US administration are engaged in transatlantic discussions on how to ensure the implementation of interoperability between Galileo and GPS and to reap the benefits of their combined use in order to allow users to use both systems with a single receiver. The European Commission stresses that Galileo and GPS will be complementary but separate infrastructure systems and that together they will increase the total size of the global satellite navigation and positioning market (Figure 1).

Figure 1 Market growth opportunity for Galileo

Source: CEC 2002b.



Funding and Objectives: The Policy Debate

In mid-March 2002, the European heads of state and governments reaffirmed the strategic importance of the Galileo project and gave it unanimous backing at the European Council meeting in Barcelona. In late March, the EU Transport Council voted to support and release financing for the development phase of Galileo (Euro 450 million from the EU Trans-European Network budget) in addition to the complementary funding agreed by European ministers for research and space affairs at the ESA Council Meeting in Edinburgh in November 2001. The transport ministers subsequently adopted regulations for establishing the Joint Undertaking, which will undertake the management of the Galileo program in cooperation with the ESA and tasked the European Commission to set it up without delay (Council 2002). The first satellites are expected to be launched in 2005 and the system to be fully operational in 2008.

The EU agreement on Galileo in spring 2002 followed debates in and among national governments within Europe and between Europe and the US administration.[1] Some government departments in Germany, the Netherlands and the UK (and also in

Austria, Denmark and Sweden), particularly the Treasury departments (and others such as the UK Department of Transport, Local Government and the Regions), wanted public investments to be kept to a minimum and assurances that Galileo would be commercially driven, with the private sector bearing its share of the development costs at an early stage. They envisaged that private sector investments would amount to around two thirds of the program cost during the deployment phase (2006–2007), with major revenue streams expected to come from commercial and professional services and royalties on chip sales. In addition, some ministries of defense in the European NATO member countries, not least the UK Ministry of Defense, did not want to upset the special relationship with the Pentagon and the American intelligence community.

European ministers of research, industry and space affairs were more enthusiastic toward the Galileo program and eventually obtained support from the heads of government even in reluctant governments. In late February 2002, the German minister for transport announced that the German government would approve the allocation of Euro 155 million to the funding of trans-European networks, which resulted in a majority block being formed and eventually unanimous approval of funding for Galileo's development phase (2002–2005). However, ESA ministers had problems getting their act together. They had oversubscribed the ESA GalileoSat program to the amount of Euro 730 million, 130 percent beyond the required Euro 550 million, and a disagreement emerged about the distribution of the work activities that would be allocated to industrial players in each country. Ordinarily, part of the bargaining game in such a large R&D project is to threaten to withdraw or reduce contributions unless the return of invested money and program development costs meet expectations. Such "negative" distributive bargaining was not however an issue with Galileo, due to its strategic importance and potential economic-industrial benefits. The German government argued that the ESA coordinated procedure for mandatory space programs would contribute to European GDP, benefiting the large German economy in a context where there was already a significant willingness in funding the Galileo program. The country that invests most funds also strengthens its role in terms of contract distribution and industrial leadership. Other countries, in particular Italy, but also the UK, France and Spain, did not agree. Germany resisted cuts in its proportion of the budget and a proposal according to which

70 percent of the ESA financing would be allocated to Germany, France, Italy and Britain, to be divided into four equal parts or 17.5 percent each (Space News 2002).

The political-distributional bargaining on the repartition of financing (and contracts) between ESA member states – which is complicated by a policy of geographic "just return" and the fact that the total membership of the EU and ESA amounted to 18 countries – continued throughout 2002 and into 2003. The ESA and the European Union were not able to sign the necessary constituting acts for establishing the Galileo Joint Undertaking, which is intended to run the development phase (2002–2005) and to ensure the unity of the administration and financial control of the Galileo program. It will supervise the development of the space and ground segments to be carried out by the ESA, foster the development of applications and services, gather the necessary public and private funding, ensure an optimum integration between Galileo and the first-generation European satellite navigation project (Egnos), and prepare for the management of the deployment and operational phases (to be managed by a private sector company). While the launch of the Galileo satellite navigation system is listed as one of the main priorities for supporting the European information society (CEC 2002h), the strategic importance of the Galileo program also led to controversies regarding where the Joint Undertaking should be located. The Italian government wanted it to be located in the Tiburtina Valley in the greater Rome area where some major satellite players are headquartered. The European Commission and the ESA stressed that the delay in launching the development of Galileo represented a serious setback. Industrial teams throughout Europe were waiting for the decision and Galileo needed to be operational by 2008 in order to reap benefits launching high-capability services years before the modernization of the American GPS ground and space infrastructure, which faced possible delays due to the changeover in presidential administrations and competition for public funding from other defense programs.

In September 2002, the European Commission published a report on the status and progress of the Galileo program. The EU Transport Council adopted its conclusions in early December and reiterated the need for a transatlantic agreement in order to achieve interoperability between Galileo and GPS at user level and compatibility at system level. Moreover, it asked the Commission to continue negotiations with the

Russian Federation to strengthen collaboration and ensure interoperability between Galileo and Glonass, invited the Commission to prepare a proposal for negotiations with the People's Republic of China, and supported collaboration with other third countries (CEC 2002g). The Commission also signaled its intention to present a proposal to establish an operational Galileo Security Authority to further institutionalize the work on security considerations (such as encryption policy and technology) and negotiations with third countries (for example, frequency-sharing arrangements). In late 2002, the European Union adopted the financial regulation of the Joint Undertaking, and the rules of procedure of the Galileo Joint Undertaking Supervisory Board (composed of representatives of the EU member states), which will supervise the Joint Undertaking together with the ESA Program Board. It also authorized the provisional administrative steps to prepare the operation of the Joint Undertaking and the concession contract (the contents and scope of which was to be prepared in parallel with the concession competition among candidate concession holders – drawn from system and operations suppliers, banks and equity shareholders), which should be awarded by mid-2004.

Key to the Future: The Perspective of Industry

Galileo is the spearhead project for the evolving European strategy for the space sector and a technology-based economy. It is expected to be of significant importance for the European aeronautics and space industries and is expected to have positive implications for the wireless communications, information technology and electronics sectors (CEC 1999a, 2000, 2001c). The European space industry, headed by Galileo Industries (Astrium, Alenia Spazio and Alcatel Space) that hoped to become the Galileo prime contractor and that won the first development contract in July 2002, has been the strongest proponent of the Galileo project. Politically, the Galileo Industries depicted the project as a significant moment in the history of the European Union. Before the EU decision in March 2002, industrial leaders representing the major companies and trade organizations (including the European aerospace and defense company, EADS) reprised the vital importance of the Galileo infrastructure program for the development of key high technology markets, the creation of more than 100,000 jobs, the promotion of European know-how and products around the world, and European industrial progress in

strategic future markets related to mobility in the information society (Blank 2002; Galileo's World 2002). The European aerospace industry, along with the European Commission and other strong promoters of Galileo, stressed a decision was urgently required and supported the perception among many policymakers in Europe that the United States intended to protect its economic and commercial interests.

European industry forwarded concerns to the EU and national governments that US companies would most likely be given privileged access to technical specifications and planned modifications, thus putting European firms at a competitive disadvantage. The US administration tried to dissuade foreign governments and industries from investing in their own systems to retain its monopoly, protect past investments, and support the entrenched position of its domestic industry. In this context, industry argued that public support to develop a European satellite navigation capability was a strategic necessity and that without an active European participation in future GNSS markets the European space industry could be eliminated as a supplier of future international system(s). Participation in the world satellite navigation markets would permit European industry to develop technological capabilities and long-term commercial and industrial leverage. The strong global position of the US GPS industry, and the relatively limited expected impact of retaliatory measures by other countries on European private sector actors (due to their relatively weak presence in overseas markets) if the European Union actively supported Galileo, offered European industry an opportunity to ask for substantial public support from the European Union institutions. The European space industry further facilitated a momentum behind Galileo in that the major companies were able to organize themselves at the industrial and political level. In addition to the Galileo Industries consortium, European industry is represented in the political decision-making process through the Organization of European GNSS industry, OREGIN (the focal point for the Galileo user segment), and Galileo Services (Galileo downstream technology, services and applications development).

Transatlantic Bargaining? The US Perspective

The US Policy for GPS as a dual-use infrastructure is aimed at strengthening and maintaining national security, encouraging private sector investment in and use of GPS

technologies and services, promoting safety and efficiency in transportation and other sectors, fostering international cooperation in using GPS for peaceful purposes, and advancing scientific and technical capabilities. The US Department of State had the task, as of US GPS policy of 1996, to pursue cooperation with other nations to promote GPS as a world standard. In 1998, for example, the US government signed a joint statement on GPS cooperation with Japan, which was followed by cooperation initiated in 2002 between GPS and the Japanese regional constellation called Quasi-Zenith Satellite System (QZSS). It also conducted talks with Europe and the Russian Federation. The US policy for GPS is today jointly controlled by the Interagency GPS Executive Board at the Department of Commerce, with the objective of increasing the acceptance and use of GPS and promoting GPS as a world standard (Braibanti and Kim 2002).

The US government had an incentive to maintain its dominance in satellite navigation for reasons of industrial and trade policy, as well as national security, and repeatedly aired concerns about some aspects of the EU's plans for Galileo. Initially, the GPS infrastructure was intended to become a so-called force-enhancer that would reinforce the combat effectiveness of US (and NATO) forces. The US Department of State stressed that the European Union should not develop controlled-access services, user fees and regulatory measures to generate revenue streams since that would hardly be compatible with open markets and the realization of a seamless global navigation satellite system (West 1999). In 1998 and 1999, it presented basic principles for cooperation and a draft transatlantic agreement to the European Commission demanding that Europe support market-driven competition and freedom of choice for end users, ensure that manufacturers would have equal access to technical specifications for receiver production, not impose any direct user fees for safety-critical services, not mandate the use of their systems, and that any disputes should be settled through existing trade agreements and organizations (WTO). The US government stressed the need for protection of national security interests and informed the European Union that a transatlantic framework agreement needed to be in place before technical discussions.

In the fall of 2000, the US government presented a new framework agreement text to the European Union, which reiterated the need for non-discrimination and free trade and demanded that no overlay of military GPS band would be allowed and that

consultations would be required before introducing any new standard or regulation for satellite navigation. The proposed agreement was followed by a counterproposal in May 2001 from the European Commission. Hawks in the US Department of Defense became increasingly active and framed the issue as a central concern for NATO and US national security. In early December 2001, shortly before EU meetings on Galileo, the US Deputy Secretary of Defense Paul Wolfowitz expressed concerns to the EU defense ministers about security ramifications for future NATO operations. Wolfowitz claimed that the Galileo signals could jeopardize the military GPS signals and that Galileo could be used for military purposes. The military-only signal, defined within the NAVWAR project and the future GPS III program, allowing the Department of Defense to maintain an edge in precision weapons targeting not available to other parties. Wolfowitz indicated that civilian authorities in Europe should not manage the Galileo project, and that European NATO countries and defense ministers must exert pressure on their governments in Europe with the objective of allowing military authorities to discuss strategic issues.

The Clinton Administration and particularly the Bush Administration lobbied the EU institutions and national ministries, saying that logic and economics suggested that there was no real need for a second satellite navigation and positioning system: "The United States Government sees no compelling need for Galileo, because GPS is expected to meet the needs of users around the world for the foreseeable future" (US Department of State 2002a, 2002b). In addition, the money that had to be invested in the Galileo project could be spent on developing other badly needed European capabilities. Bialos argued that, "Given the serious U.S.-European military capabilities gap and limited European resources to close it, many have believed that Europe would be better served by spending the large resources involved on Galileo (at least $3 billion) for other war-fighting purposes, such as intelligence satellites" (Bialos 2002).

When these lobbying efforts failed to sway an increasingly determined and unitary EU actor, the US government decided to raise the debate within NATO and play on the Atlanticist orientation of several EU government departments. The willingness of many supporters of Galileo to consider autonomous military capabilities contributed to tensions with the Bush Administration, and particularly its more conservative camps, about the emergence of high-capability strategic assets potentially outside the immediate

control of NATO. American NATO officials, the Department of Defense and the Department of State continued expressing their view that their European allies should not develop a system that would interfere with the civil and military GPS signals.

The US government did not want a European-controlled system that would challenge its global commercial and military monopoly and preferred European use of GPS. It therefore stressed that the European Union must accept its proposal for a transatlantic agreement. For some this was an untenable position after the European Union secured funding for Galileo in the spring of 2002. "The reality, however, is that this 'cart before the horse' approach, appropriate at the time, is now counterproductive. We now need to deeply engage with Europe to develop ways to work together, help shape what Europe creates and ultimately create a single system for end users," said the former head of the Department of State delegation to transatlantic talks on GPS-Galileo (Bialos 2002). European efforts to reach an agreement on public funding in 2001 and 2002 prompted renewed efforts by the US government bring pressure to bear on European governments. Would the European Union respond in an acceptable manner to the basic principles of cooperation outlined by the US government? Would Europe introduce regulations and standards that mandated the use of Galileo? Would Galileo take on a strategic military role? How would Europe protect sensitive encryption technology and prevent hostile misuse of Galileo?

Satellite navigation and positioning is central to US and NATO military operations and weapons systems (command, control and consultation services, including navigation and precision strike). Its importance will become increasingly indispensable for missions and tasks in support of NATO operations. Transatlantic discussions need to resolve fundamental issues such as how to meet potential threats to the physical infrastructure and operations of Galileo and GPS and how to restrict uncontrolled and hostile proliferation of Galileo and GPS signal transmission and associated data (Lembke 2002b). The European Commission had considered overlaying the encrypted Galileo Public Regulated Service (PRS) directly on top of the GPS M-Code (the encrypted future military GPS capability). The Galileo PRS – a service that is encrypted and resistant to jamming and interference that will be under the control of national security authorities of EU and ESA member states – is intended for applications devoted to civil protection,

national security and law enforcement that demand a high level of continuity of service. American officials voiced concerns about the co-sharing of frequencies between Galileo and the military GPS M-Code, which in their view constituted a strategic problem in that it is not "dual-service compatible" and therefore unacceptable. "The stakes are high, and I am not talking about dollars or euros. I am talking about our nation's security and the well being of the men and women in uniform we send in harm's way. Therefore, the sooner we can wrestle these technical issues to the ground, the better," said Robert G. Bell, NATO assistant secretary general for defense support (Bell 2002). Transatlantic technical discussions on the interoperability and compatibility of European and American satellite navigation systems could thus result in a transatlantic regime agreement:

> Simply put, we need to respect Europe's decision – based on its own calculus of interests – to develop Galileo and recognize and deal with the new reality of European participation in global navigation. Galileo's development should usher in a new period of sober assessment of how the United States and its trans-Atlantic partners can work together to create a win-win for consumers and our mutual security (Bialos 2002).

In 2003, the US objectives for transatlantic cooperation consisted of four overall goals: protecting national security interests (no interference with Department of Defense and NATO denial capabilities, equal access to the specifications and encryption algorithms for controlled access services as well as to encryption regimes, no overlay of planned military signals, no discussions outside of NATO regarding any military use of Galileo); protecting investments in GPS infrastructure and the interests of its users (no degradation of service, freedom of choice for users, free market competition, interoperability and backward compatibility); ensuring a commercial level playing in the global marketplace (including national treatment and most favored nation-like obligations in the transatlantic marketplace); and maximizing the benefits of combined GPS-Galileo services. In the field of regulations and standards, the US government is pushing for the need to ensure that any new standard must be technology neutral and that agreements must be binding for the whole of Europe and its various organizations in the area of satellite navigation. Even though there was no real transatlantic progress on the issue of M-code overlay in the field of security during 2002, technical working groups were established to discuss

compatibility and interoperability in non-military areas. Satellite navigation will remain an important transatlantic issue in the years ahead.

Launching Galileo: A More Assertive Europe

Galileo's proponents (the European Commission, the European heads of state and governments, the ESA, and European aeronautics, space and defense electronics companies) envisage Galileo as crucial for autonomy of Europe in defense matters when an era where vital economic, social and strategic functions increasingly rely on satellite navigation. The accuracy of GPS in precision bombing and satellite imagery – and the lack of access to and control over such capabilities – helped European governments and the European Commission to understand that Galileo is an important infrastructure for the EU Common Security and Foreign Policy. As the European Commission noted, "If the EU finds it necessary to undertake a security mission that the United States does not consider to be in its interests, the European Union will be impotent unless it has the satellite navigation technology that is now indispensable. Although designed for civilian applications, Galileo will also give the European Union a military capability" (CEC 2002b).

The European political and industrial community that rallied behind Galileo argued that Europe must exert a common political will in matters of high technology to interact with the Unites States on a more equal basis. If the US government would have to rely on a global satellite navigation system operated by allies in Europe, it would likewise develop a separate system. Some also questioned why the US government should have a monopoly over the control of weapons systems – and its GPS industry over commercial services and applications – based on satellite navigation and positioning, thus reinforcing the preeminence of American world power and the uneven use of global resources, including space-based communications capabilities in gathering economic intelligence through technical agencies. Galileo, the European Commission argued, was an important capability to liberate the continent from dependence on the American monopoly over satellite navigation in global markets and on its unilateral control of a global utility. The explicit US government's GPS strategy has been aimed at asserting market leadership and hegemonic control. The European Commission and many

European governments stress that it is the choice of Europe to decide what constitutes a "compelling need" and that there is a real need for independent control over satellite navigation capabilities.

The underlying industrial logic behind supporting Galileo is that demands on the European transport infrastructure will double by 2020, that Europe cannot build infrastructure fast enough to keep pace, and that the existing infrastructure must therefore be used more efficiently. According to the European Commission, a system under European control would generate more efficiency and benefits to European sovereignty and general economic progress (CEC 2002c). Accordingly, Europe should provide its own civil system since it cannot be dependent upon a third party and since there is also much to gain from two interoperable but separate GNSS infrastructures (new technology, global competition, enhanced performance and availability, additional value-added services). Europe also understands the US strategic objective to protect its monopoly in global satellite navigation markets, which major American aerospace companies expect to become increasingly lucrative. This potential market and export sales for commercial and military equipment incorporating satellite navigation and positioning have been central motives for both American and European public and private sector actors.

Wireless Technology in the Transatlantic Marketplace

Europe in the Lead

At the end of the 1990s, Europe enjoyed world leadership in digital wireless cellular communications, while a large portion of the infrastructure in the United States was based on analog technology (although the deployment of digital infrastructure experienced substantial growth). The US wireless industry and the Council of Economic Advisors (CEA) viewed the third generation of wireless (3G) as a driving force for American economic growth and technological prowess. The US wireless carriers employed 150,000 people and generated US$44 billion in annual revenue at the end of the 1990s (CEA 2000). Global economic stagnation, overcapacity, low levels of demand and business investment, high costs of 3G licenses, indebtedness and deteriorating credit ratings have hampered growth in the telecommunications sector, but the potential of

advanced wireless services is significant (Friis 2002). Table 1 presents an estimation of wireless penetration and subscribers by region 1997–2004.

Table 1 Estimated wireless penetration and subscribers by region

Penetration (%)	1997	1999	2001	2002	2003	2004
North America	20.1%	30.7%	46.9%	55.5%	63.9%	72.1%
Western Europe	14.1%	38.4%	69.5%	76.8%	81.0%	83.1%
South East Asia	2.4%	5.4%	9.1%	10.8%	12.4%	14.0%
Rest of World	1.1%	2.8%	6.6%	9.1%	12.0%	15.2%
Total	3.5%	7.7%	13.7%	16.4%	19.0%	21.5%

Subscribers (Millions)	1997	1999	2001	2002	2003	2004
North America	59.9	93.4	145.8	174.3	202.7	228.6
Western Europe	54.6	149.2	270.9	300.0	317.1	326.1
South East Asia	66.4	152.9	265.1	318.8	370.6	425.4
Rest of World	27.0	71.3	171.1	239.5	323.3	410.6
Total	207.9	466.8	852.9	1032.6	1213.7	1390.8

Source: Wireless Strategy Analytics (2001).

A coordinated pan-European approach toward digital wireless technology and markets has been essential for securing critical mass, economies of scale in terminal and infrastructure equipment, network economies in services, and world leadership in global markets (CEC 1999b, 1999c; Council 1999). Network externalities and compatibility standards have become increasingly important for policymaking (Besen and Johnson 1986; Abbott and Snidal 2001; Werle 2001; Lembke 2002c). European policymakers and industrialists realized that it would take time to introduce the new era of wireless multimedia. They decided to pursue a strategy that combined support for further market integration in Europe and for alliance building with standards and industrial actors in Asia, North America and elsewhere. Ericsson and Nokia stressed the importance of the Asian market and gained the support of Japanese industry (NTT DoCoMo, NEC, Fujitsu,

Matsushita/Panasonic and Mitsubishi Electric) and wireless operators in the broader Asia-Pacific region. This approach, which aligned Europe with developments and strategies in the Asia-Pacific region, was supported because of the prospect of lucrative Asian markets. The benefits of a larger global market were greater for internationally oriented firms with strong presence in overseas markets than the risks and costs of future import competition and declining market shares at home (Lembke 2002a).

Playing Catch-Up: The Standardization Initiative of US Industry

Industrialists, legislators and administration officials in the United States launched a campaign against European practices in the field of wireless standardization and regulation after the decision on the basic concept of the future Europe radio interface technology (wideband code division multiple access, W-CDMA) in early 1998. On the industrial side, Qualcomm headed the lobbying (with support from Lucent Technologies and Northern Telecom, Nortel), which had substantial investments in its own (non-wideband) CDMA2000 system that they wanted to protect. The development of wireless technology was subjected to an international intellectual property rights (IPR) blocking situation that was stalling international standards activities, primarily between Qualcomm and Ericsson – the world's biggest producer of mobile networks (mobile switching, base station controllers and other equipment for wireless networks). IPR has played a significant role in the development of the next-generation wireless technology infrastructure by structuring international and intra-industry competition and cooperation. Through royalty-bearing and reciprocal license agreements, leading manufacturers leverage their preferred technology under their patent portfolios, which in turn allow suppliers in other regions of the world to develop, manufacture and sell infrastructure and subscriber equipment. Manufacturers can thereby increase the global footprint of the technology and market size as well as transform the international division of labor.

The European approach was guided by the quest for deeper European integration and by the "collaborative competition model" that supported harmonization, open systems and *ex ante* or "anticipatory" standardization resulting in publicly available standards, whereas the US "market determination model" favored divergence, proprietary systems and *a posteriori* standardization. The EU institutions, the European

Telecommunications Standards Institute (ETSI), and the European wireless industry were concerned about licensing and IPR strategies that threatened to turn standardization and technical issues into battlegrounds for competing commercial interests. They were likewise concerned about what they perceived as a "misinformation campaign" on Capitol Hill that could plunge the United States and the European Union into a transatlantic dispute (the US government was likewise concerned about what it perceived as misinformation and myths about the GPS navigation infrastructure).

In late 1997, the ETSI Director-General asked Qualcomm whether it claimed any IPR essential to the radio access technology developed through the ETSI by European, Asian and North American companies. Would Qualcomm be prepared to grant licenses for the patent rights if it claimed to own essential IPR in accordance with the terms and conditions set out in ETSI IPR policy? Qualcomm responded that it owned IPR that were essential to the proposed radio technology, including the leading proposals supported by European wireless manufacturers and the allies they had gathered in the Asian and North American manufacturing industry (Qualcomm 1998). The company stated that if W-CDMA were to remain as it stood, it would not agree to grant licenses under its essential intellectual property according to ETSI IPR policy. It lobbied intensively on Capitol Hill, calling for convergence between its own proposal (CDMA2000) and the ETSI proposed specification for W-CDMA. "Qualcomm wished to force through a single standard that was not linked to GSM...because GSM was already well positioned in the market. In the end, this is the hard battle of global competitiveness and about being first to the marketplace" (European Commission, interview with author, June 1999).

Championing CDMA

The transatlantic disagreement deepened when the draft of the common EU regulatory position on 3G wireless communications emerged in Europe. At a hearing on "Trade Relations with Europe and the New Transatlantic Economic Partnership" at the US House Subcommittee on Trade/the Committee on Ways and Means in July 1998, Qualcomm presented criticism of ETSI and European standardization. It claimed that the ETSI standardization and EU policy (1) created an unnecessary barrier to trade in violation of the WTO Technical barriers of Trade (TBT), (2) favored a wireless

technology manufactured by large European concerns, and (3) supported an exclusionary industrial policy by denying GSM's competitors entry into the European market. Therefore, Qualcomm argued, it was forced to fall back on its IPR to protect its current customers and its position in the next generation of wireless technology.

Qualcomm used its political contacts on Capitol Hill to push for its own preferred technology. Members of Congress sent letters to United States Trade Representative (USTR) Charlene Barshefsky accusing the European Union of pursuing an industrial policy that could leave American firms competitively disadvantaged in Europe and have broader ramifications for the transatlantic trading relationship (Matsui 1998). Senator Ernest F. Hollings charged that European practices were protectionist and that competing technologies developed in the United States could be locked out of the European market, which resulted in an "asymmetrical transatlantic relationship". Hollings argued that since the American market remained open to technologies developed in Europe, the United States "should ensure that there is a reciprocal trading relationship that would enable US companies to profit in Europe" (Hollings 1998). Some Members of Congress went as far as suggesting to the USTR that the European approach to 3G wireless should be included in the National Trade Estimate Report as a Super 301 priority; that is, it should be judged unduly restrictive to trade and thus punishable by unilateral trade retaliation. After pressure from Congress and the American CDMA industry, the USTR responded that it was reviewing the consistency of the EU's measures with its World Trade Organization (WTO) obligations and that it considered wireless standards as an issue of vital importance for US telecommunications manufacturers and service providers. As Barshefsky told Congress, "Let me assure you that this Administration stands by previous assurances that the United States will use the WTO to open foreign markets to U.S. telecommunications equipment and services" (Barshefsky 1998).

In letters to the US Congress, the ETSI Director-General Karl Heinz Rosenbrock stressed that its standardization process was driven by the private sector (80 percent of the funding) and was marked by openness, balance of interests, an appeals process and consensus, and, contrary to the claims of US industry, did not result in the creation of unnecessary barriers to trade between the United States and Europe (ETSI 1998a, 1998b). The European leadership in wireless communications was the result of a balance of

interests leading to collective benefits for market actors through collaborative competition: "Just as the US government recognizes the importance to encourage long-term growth for enterprises and promote efficiency and economic competition through harmonization of standards, so does Europe" (ETSI 1998a).

In December 1998, the Clinton Administration sent a letter to Martin Bangemann, EU Commissioner for telecommunications and industrial policy, signed by US Secretary of Commerce William N. Daley, USTR Ambassador Charlene Barshefsky, FCC Chairman William Kennard, and US Secretary of State Madeleine Albright. They continued voicing concerns throughout 1999 about the European regulatory process for 3G wireless, stressing that the United States wanted the procedures of any EU member state to support neutral licensing in terms of technology, unlimited market access, and non-discriminatory treatment of American suppliers of wireless telecommunications services and equipment (USTR 1999a, 1999b). Bangemann replied to the US complaints, stressing that industry should drive the wireless standardization, innovation and commercialization process (CEC 1999c). He reminded the US government of its regulatory intervention in the development of digital television by adopting an exclusive standard in 1996 that had the same objective of interoperability. In addition, the US government and standards bodies had opted for a single radio standard for the first generation of (analog) wireless communications. The European Commission pointed out that the United States had not respected the 1992 recommendation by the International Telecommunications Union (ITU) identifying spectrum for 3G wireless communications. It claimed that US policy had led to different 3G system proposals and to a fragmentation of spectrum allocation at global level, which moreover potentially blocked new entrants from entering the US marketplace.

A central objective of the EU policy for wireless communications was to support interoperability and pan-European roaming as well as standardization based on an open multinational consensus-based approach in order to facilitate economies of scale in terminal equipment and network economies in services, throughout the EU territory and beyond, in accordance with market demand. The European Commission stated that it had no intention to impose backward compatibility between wireless systems, nor convergence of future wireless standards toward a single converged standard at European

or global level. Under the EU legislative framework, standardization was entrusted to formally recognized organizations in a process that involved companies also from North America, Japan and other parts of the world. The European Commission supported the "new" European standardization model, which supported competition on price and services and allowed competition between technologies as long as they constituted and were compatible with coherent standards (Lembke 2001).

Diversity within US Domestic Industrial Interests

Legislators in the US Congress continued lobbying the Clinton administration about the EU's approach to standards for digital wireless technology, claiming that the EU's adoption of an "exclusive, mandatory standard for digital wireless technology" would exclude American technology from European markets and thus discriminate against American firms, workers and consumers (Levin 1999; Conrad, Baucus and Robb 1999; see also FCC 1999). Senator Tom Daschle urged the USTR "to consider the full range of negotiating tools in order to send the necessary message to the European Union that the United States will not tolerate any protectionist effort to shut out American digital wireless technology from competition in European markets" (Daschle 1999).

While Qualcomm received substantial Administration and Congressional support in opposing the EU's regulatory regime, a number of complaints were made to the US government regarding the political activity of the CDMA industry on Capitol Hill. The Computer and Communications Industry Association (CCIA), for example, complained to Vonya McCann (US Coordinator and Deputy Assistant Secretary of International Communications and Information Policy at the US Department of State) about "the apparent efforts by some manufacturers of wireless equipment to use the US Government to advance their firms' parochial interests in the international standards-setting process at the expense of others" (CCIA 1998). The North American GSM Alliance LLC, the North American Interest Group of the GSM Association, and the GSM Alliance (a consortium of US and Canadian wireless carriers) urged lawmakers to stress the need for multiple standards and market competition at both domestic and global levels. In addition, the Universal Wireless Communications Consortium (UWCC), which promoted TDMA technology, called on the US administration to keep a hands-off approach with regard to

the formal international standardization process and argued for a multiple global standards regime for 3G wireless communications (UWCC 1998). It complained to the US Department of Commerce that the latter had favored CDMA technology in bilateral talks with China and elsewhere at the expense of other technologies to the point that it appeared as if it was the US government's technology of choice. "The Administration's absence of any public focus on TDMA in regard to its China trade agenda is creating an unintended but potentially serious problem for UWCC members that employ over 70,000 employees and have over US$30 billion invested in TDMA" (UWCC 1999).

Regional standard bodies from around the world were to submit proposals for 3G wireless standards to the ITU at the end of June 1998. The US Department of State led the process of selecting proposals in coordination with the FCC and the National Telecommunications and Information Administration of the Department of Commerce. Four proposals had been selected and would be circulated to industry representatives on the US National Committee for final review before being submitted to the ITU. Several US House representatives voiced their concerns to McCann at the Department of State and stressed that decreasing the number of proposed standards could stymie America's progress in the wireless telecommunications industry: "Each of the American proposals has significant US industry support from both wireless carriers and equipment manufacturers. I know you can appreciate the years of cooperative industry work that led to the development of these four proposals, and I trust that the final US proposal will acknowledge this fact and refrain from favoring any one technology over another" (Hutchinson 1998). In early 1999, the Chair of the US Subcommittee on Technology and Competitiveness, Susan Corralez-Diaz, sent a letter to President Clinton on behalf of the President's Export Council. She stressed the importance of aggressively promoting a multiple standards regime in domestic and international organizations: "It would be sharply counter to the interests of the US industry as a whole either to advance any particular US technology over another, or to fail to promote a multiple standards regime" (Corralez-Diaz 1999). Conrad Burns, Chairman of the US Senate Subcommittee on Communications, and other members of Congress stated that there was no clear evidence of anti-competitive trade practices or market barriers in the European Union. They urged the Clinton Administration to promote an open, competitive global marketplace and

timely provision of 3G wireless services in the United States and abroad and to resist delays in the consideration and approval of multiple wireless standards at home and abroad (Burns 1999; Helms et al. 1999).

A Compromising Solution

In Europe, equipment manufacturers with interests in the Asian markets aired concerns to the European Commission about the US trade pressure on the Japanese governments and standards bodies, which threatened Europe's leadership the future potential in lucrative Asian markets. Industry argued that if the Japanese government had to bend to the US pressures, this would have a number of serious and strategic implications. "International standards for products, processes and networks are increasingly important to industry due to the quickening pace of technological innovation and the globalization of trade. Japan is key to capturing Asia, a market that by the year 2005 is expected to be larger than Europe and North America combined. Therefore the support of Japan for a future mobile communication standard is of critical importance" (European Commission, interview with author, April 1999).

The European manufacturers – notably Ericsson and Nokia – pointed out to the European Commission that it had to be prepared for a transatlantic trade war and that it should further strengthen the cooperation with the Japanese government. If the US succeeded in forcing harmonization ("a compromise standard") on Japan, these companies argued it would reduce the integrity and performance of the technology proposal in Europe, weakening the likelihood of gaining a stronghold in Asian markets developing a truly wireless multimedia infrastructure and society. Secondly, it would disrupt the close strategic cooperation between European and Japanese industry and standards bodies as well as impede global economies of scale. Thirdly, a compromise solution would challenge the overall European objective to strengthen its information and communications technology industry. The balance of economic and political power would shift to the US, diminishing the chance of European technology maintaining or increasing its global position, and potentially threaten thousands of jobs in Europe.

The European Commission discussed different options to ward off the American pressure, including setting up a task force within the ITU – with support from Japan – to

work toward interoperable standards and a global infrastructure. It reckoned that such a move would keep Japan and Europe in one camp and promote the development of a common global standard while avoiding isolation of the United States or further polarizing the other regional parties involved. The discussions that took place on 3G wireless standardization and trade in the Transatlantic Business Dialogue (TABD) were critical in reducing transatlantic tensions, as were the technical and standards activities in the Third Generation Partnership Project (3GPP), which consisted of formally recognized standards bodies from Europe, Japan, China, Korea and the United States, supported by industry groups and around 500 companies.[2]

In addition, the international political and industrial pressure exercised by pure-play wireless operators (with a strong international position in GSM markets and with investments in multiple technology infrastructures) on equipment manufacturers through the Operators' Harmonization Group (OHG) was of pivotal importance. It argued that IPR should not be used by any company or group of companies to delay the introduction of next-generation services, withhold the use of the technology from a achieving harmonized international standard, restrict the import or export of equipment to or from any country, increase the cost of equipment or services beyond customary levels, or stifle innovation and the free flow of ideas. The OHG concluded that continued public IPR disputes were damaging to the global wireless industry (OHG 1999a, 1999b).

The work on technical specifications for 3G W-CDMA wireless hardware and software continues through the 3GPP. A main development since 2000 is the freezing of sets of specifications – release 4 (March 2001) and release 5 (March 2002) and release 6 expected to be functionally frozen in late 2003. They add further functionality as a result of ongoing standardization work (for example, a steady trend away from circuit switching – voice and low-speed data – towards packet switching – voice and medium-speed data – and with the option of new internet protocol technology – voice and high-speed data). These specifications represent an evolution of the GSM infrastructure and only the radio access technology (UMTS Terrestrial Radio Access or UTRA) is radically new. In addition, operational networks have been set up on a trial basis and there is already a real commercial FOMA service in Japan. In early 2003, NTT DoCoMo announced that it intended to subsidize 3G-handset development cost in order to reduce the burden of

domestic manufacturers and to spur the market, and it is aggressively seeking to increase its role in American and European markets. In January 2003, commercial W-CDMA service was initiated in Italy. While not specifically tied to 3G networks, a lot of stress in the United States (as well as elsewhere) has been placed on location-based services; obtaining a precise location for a mobile is useful both for security reasons (enabling the police to track down miscreants) and for commercial services (targeted advertising, providing information on restaurants, cinemas, etc., in the physical vicinity of the user). Furthermore, the Chinese Ministry of Information Industry and a coalition of manufacturers, with support of Siemens, are moving ahead with a homegrown 3G wireless standard, TD-SCDMA, as a way to strengthen domestic industry, as a hedging strategy and as a potential bargaining tool with foreign industry.

The relative international competitiveness of European industry may weaken and rival technologies and their coalitions may gain advantages as a result of the EU policy and technology strategy for wireless Internet. It is far from certain, however, that European companies, and adopters of their technology worldwide, will see their command of the global marketplace dramatically reduced and its position as a regional hegemon at home significantly weakened, even though East Asian and American firms are likely to become stronger in European and international markets. In the fall of 2002, the penetration of wireless communications in Europe based on the GSM standard amounted to 75 percent of the population (CEC 2002f), and the GSM technology is gradually becoming stronger in North America. Supporters of wireless expect a growing demand for data traffic and revenues as 3G becomes a commercial reality. According to the UMTS Forum, global service revenues from 3G networks will represent a market opportunity of US$320 billion by 2010 (US$118 billion of which will be generated in the Asia Pacific region with markets with low wireless penetration rates, such as China and India, representing the greatest growth opportunities) – even though the minority of users will still use 2G – and around US$1 trillion over the whole decade (UMTS Forum 2002).

Regulatory Strategy and Support

The European Union institutions have continued analyzing the central financial, technical and regulatory challenges concerning the deployment of 3G wireless

infrastructure and services as a means to support the creation of a competitive knowledge-based economy for Europe (CEC 2001a, 2002d–f). The EU policy for wireless Internet emphasizes the need to support open platforms and architectural and application program interface standards, hardware and software interoperability and consumer access to new services and applications. The European policy for standards has been modified to allow for competition between technologies (Lembke 2001). The ambition of the European Commission is to ensure a stable regulatory environment that supports a competitive market and user choice regarding various technology platforms, including 3G wireless communications until this market reaches cruising speed. "The main task of the EU institutions is to prepare a suitable regulatory environment which allows for the necessary degree of European harmonization and ensures the regulatory certainty on which the future 3G players can build their business cases" (CEC 2001a). It has asked national governments and regulatory agencies – and equipment manufacturers, network operators and service providers – to consider reforms of spectrum assignment practices, license conditions and methods, legal coverage requirements, and to consider establishing more flexible network-sharing conditions. As a response to the Barcelona European Council in March 2002 and the Seville European Council in June 2002 of European heads of state and government, the European Commission launched a public consultation process on remaining barriers to the full deployment 3G wireless infrastructure and achievement of widespread access to new services and applications. The EU eEurope Action Plan 2005, a follow-up document to eEurope Action Plan 2002 which was adopted by the European Commission in May 2002 and which will run from 2003 to 2005, intends to accelerate the deployment of 3G wireless infrastructures.

The industrial landscape is different in the United States, which has colored the behavior of the government and regulatory agencies. American manufacturers produce equipment for several second-generation terrestrial wireless standards and network operators have invested in and defend different technology platforms. In the fall of 2000, then president Clinton released a memorandum directing the FCC and Department of Commerce, which have shared responsibility and jurisdiction for the management of radio frequency spectrum, to lead a government-industry effort to ensure the timely deployment of 3G services and to complete assignments of licenses for spectrum by the

fall of 2002. In the summer of 2002, shortly after an interagency Spectrum Policy Task Force was created to study spectrum policy, the Bush Administration reached a deal with the Department of Defense to make spectrum available for commercial services that the latter had controlled. In late 2002, the Task Force made its final recommendations on advanced wireless services, including 3G, as part of the government's ambitions to pave the ground for market competition among multiple 3G standards and to support the future competitiveness of US industry.

Concluding Remarks

The American and European approaches to satellite navigation and third-generation wireless communications represent offensive political-economic approaches with the objective of gaining access to lucrative export markets, enhancing overall competitiveness in high-technology industries, promoting job creation, stimulating positive macro-economic externalities and user benefits, and strengthening policy capacities and global economic, political and strategic positions. It illustrates the role of governments in structuring the context of global competition in high-technology industries and, arguably, a possible trend toward a new form of critical industry support for high technology in the transatlantic marketplace. By extending the global footprint of its preferred technologies, industry seeks to maximize economies of scale in equipment and network economies in services. This chapter contends that the variation and similarities in behavior and strategies across sectors and the Atlantic are largely the result of relative international competitiveness.

In the field of satellite navigation, the United States significantly benefit from a position of unchallenged dominance in terms of job creation, scientific and technological progress, and market shares in civilian and defense markets for equipment and services. A European competitor risk the future benefits accruing from this monopoly and expected lucrative markets. The European Union has decided to counterbalance the position of the US GPS coalition and technology as a global hegemon and the institutional deadlock of GPS in European markets that are expected to increasingly rely on satellite navigation and positioning. Even though it could be the case that this major European investment will not be as successful in commercial and security terms as is

hoped, the US GPS interests will likely see its global superiority increasingly challenged. Both the US government and the European Union teamed up with Japan, in the field of satellite navigation and wireless communications respectively, in order to strengthen the coalition behind the commercial and technology strategies of leading domestic industrial actors at home. It is difficult, however, to achieve and maintain a position as regional industrial hegemon at home and even harder to do so on a global scale in high-technology sectors of vital and growing importance.

The US policy for wireless communications eventually supported multiple standards as being conducive to domestic and global competition and innovation, thus echoing the European philosophy in the field of satellite navigation. The global orientation of the US and particularly the European approach in the wireless sector is largely the result of the pressure from those internationally oriented equipment manufacturers, and pure-play wireless operators that had invested in more than one wireless technology, that had commercial and research presence in overseas markets, and therefore were sensitive to the behavior of foreign governments and industrial actors. The United States faced a more complicated situation due to investments in and competition between several wireless technologies. This situation is less the result of deep-rooted historical, structural and cultural systems of political economy and models of industrial policy than relative international competitiveness and lobbying between different interests. If the situation would have been the reverse, it is more plausible to expect that the United States would have challenged a European satellite navigation system that enjoyed a global monopoly. It would have been less likely to support market competition between various wireless standards if it would jeopardize the position of a technology platform that enjoyed a commanding international leadership and a position as regional hegemon in the United States. This comparative analysis suggests that a more nuanced perspective on new forms of high-technology infrastructure support can generate valuable insights into the logic of the transatlantic marketplace.

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[1] The European airlines community voiced a number of concerns over the European plans to fund the first generation of satellite navigation and positioning in Europe – the European Geostationary Overlay System (EGNOS). The Association of the European Airlines (AEA) complained about cost allocation and cost recovery. It argued that EGNOS constituted a wrong business investment from a European airspace user's point of view since it did not provide any tangible operational benefits to commercial airlines. In addition, significant investments of taxpayer's money in an overlay system to GPS (EGNOS) would increase Europe's dependency on GPS and would not remove the institutional deadlock of the use of GPS in Europe. Rather, Europe needed to leapfrog in order to reach and potentially surpass the American dominance in satellite navigation. In January 2002, the European Commission's Directorate for Transport and Energy wrote to the International Air Transport Association (IATA) saying that the civil aviation community would not be discriminated against and would only be asked to pay its fair share of the cost of the Galileo program, which was well received by the IATA. In a letter to the EU Commissioner for Transport and Energy, Loyola de Palacio, the IATA indicated its support for the Galileo program: "I would like to confirm, once again, that the international airlines community welcomes the Galileo initiative on the basis that it will play a prominent role in meeting the needs of civil aviation for a worldwide, safe and cost-effective GNSS solution covering all phases of flight" (Jeanniot 2002).

[2] In the framework of the TABD, standardization and regulatory policy regarding 3G was discussed under the Electronics, Electrical, Information Technology and Telecommunications Sectors (EETSI) group. A number of principles with respect to 3G mobile infrastructure and policy were agreed in late 1998. Government regulation should be kept to a minimum, interoperability of networks and standards should be ensured, market forces should drive the process, and frequency and licensing procedures should be consistent with ITU recommendations (TABD 1999b, 1999c). EETSI held a specially convened meeting in Washington on February 1999 on the issue of further cooperation and dialog on 3G wireless standards and

regulatory policy. The recommendations in Charlotte 1998 were again supported. "All participants in our meting strongly agreed that the United States should not on present grounds initiate a Super 301 action. This is in the interest of avoiding government action counterproductive to Trans-Atlantic progress on 3G wireless issues" (TABD 1999a). Motorola had been arguing against any Super 301 action, that is, to define it as unduly restrictive to trade and thus politically punishable by unilateral trade retaliation.