



HAL
open science

Actors, Coalitions, and the Making of Foreign Security Policy: US Strategic Trade with the People's Republic of China

Hugo Meijer

► **To cite this version:**

Hugo Meijer. Actors, Coalitions, and the Making of Foreign Security Policy: US Strategic Trade with the People's Republic of China. *International Relations of the Asia-Pacific*, 2015, 15 (3), pp.433 - 475. 10.1093/irap/lcv002 . hal-03459700

HAL Id: hal-03459700

<https://sciencespo.hal.science/hal-03459700>

Submitted on 1 Dec 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Actors, Coalitions, and the Making of Foreign Security Policy: US Strategic Trade with the People's Republic of China

Hugo Meijer*

Lecturer in Defence Studies, King's College London, UK
**E-mail: hugo.meijer@kcl.ac.uk*

Accepted 21 January 2015

Abstract

In light of the intertwining logics of military competition and economic interdependence at play in Sino–American relations, this paper examines how the United States has balanced conflicting national security and economic interests in the making of US export control policy on defense-related technology toward China. Relying upon a large body of primary sources (including 170 interviews), it seeks to contribute to the understanding of this strategically sensitive yet neglected area of Sino–American relations. It is shown that, as a consequence of the erosion of the US capacity to control the diffusion of defense-related technology to China in the post-Cold War era, a growing set of actors within the United States has reassessed the security/economic calculus in Washington's relationship with Beijing. Specifically, this coalition advocates the streamlining of export controls to sustain the defense and technological industrial base and thereby maintain American military/technological preeminence vis-à-vis a rising China.

1 Introduction

Since the establishment of their diplomatic relations in 1979, the economies of the United States and that of the People's Republic of China (PRC) have grown increasingly interdependent. US–China bilateral trade has dramatically increased from \$5 billion in 1981 to \$536 billion in 2012, and the PRC is today the second-largest US trading partner (Morrison, 2013). Coupled with the growth in their economic relations, however, in the post-Cold War era, there have been growing concerns within the US government over China's military modernization. Fueled by its rapid economic expansion, the constant rise in China's defense budgets, its import of foreign technologies, and its military-industrial espionage practices have fostered a major military modernization program. Successive US administrations have carefully scrutinized and responded to the evolving strategy and military capabilities of their 'most likely future politico-military near peer competitor' (USCNS, 1999: 70). The US–China relationship has therefore been characterized by a mixture of mutual economic interests and competition in the military realm. Arguably, this mixture of multiple and contradictory interests is one of the fundamental features of the post-Cold War international environment. During the Cold War, the United States and the Soviet Union were economically independent. As a consequence, economic statecraft was integrated with and subordinated to US security objectives. In the post-Cold War era, the absence of an overarching strategic threat, coupled with growing economic interdependencies, has created an international system in which the two objectives of economic welfare and the protection of national security increasingly represent trade-offs. As Richard Rosecrance argues, 'the essential problem for countries seeking to enhance both security and the economy is that success in one may involve a trade-off that entails failure in the other' (1997: 211).

In light of the intertwining logics of military rivalry and economic interdependence at play in Sino-American relations, this paper examines how Washington has balanced potentially conflicting national security and economic interests in its relationship with Beijing. To do so, it investigates the making of US export control policy on defense-related technology to China in the post-Cold War era. Export controls stand at the frontier between military considerations (the maintenance of military preeminence by avoiding the transfer of sensitive technologies to potential competitors)

and economic interests (job creation, exports, and economic growth). At any time, a balance must be found between the economic interests involved in exporting high technologies and the military implications of potential transfers of sensitive technologies. Trade-offs are therefore intrinsic to export control policy. This is especially true for dual-use technologies such as high-performance computers (HPCs) – the technology examined in this paper – given that their high technological content makes them at once highly profitable exports and sensitive technologies with military applications.¹ High-performance computers, or supercomputers, have both civilian applications (such as weather forecasting) and military/intelligence applications. They are used by the National Security Agency (NSA) for code breaking (cryptography) and code protection (cryptoanalysis), and by the Pentagon for simulating nuclear weapon tests, chemical and biological weapon production, designing and modeling complete submarine hulls, developing non-acoustic anti-submarine warfare sensors, and designing improved nuclear weapons and ballistic missiles. At the same time, China has become by far the largest single export market for US ‘controlled’ technologies – i.e. subject to export controls – with 86% of the total, with Russia ranking as second with roughly 6% (DOC, 2011: 61). Accordingly, while growing US economic interests in the Chinese market are likely to press for liberalizing the controls on the export of these technologies, their relevance for the modernization of the People’s Liberation Army (PLA) would require the maintenance of stringent controls. US export control policy therefore exemplifies the delicate balance between national security and economic interests that Washington must strike in its relationship with Beijing. As Adam Segal puts it, ‘the problem of designing effective export control policies for China exemplifies paradigmatic changes in the relationship among technology, trade, and national security since the fall of the Soviet Union’ (Segal, 2004: 169).

Furthermore, American post-Cold War export control policy toward China is currently largely under-explored. Several works exist on US Cold War export control policy toward the PRC (Ross, 1995; Zhang, 2001; Meijer, 2015). However, despite the rise of China as a major world power, the national and multilateral efforts to control the transfer of defense-related technologies to the PRC in the post-Cold War era have been largely

1 ‘Dual-use’ refers to goods and technologies that have both commercial and military applications.

neglected. Some articles have analyzed specific and limited areas of US restrictions on trade with China in the 1990s, such as the controversies over the controls on communication satellites, as they became a highly sensitive political issue during the so-called Chinagate (Clarke and Johnston, 1999; Johnson-Freese, 2000; Yuan, 1996). Similarly, within the literature on US–China relations, although the issue of technology controls has been touched upon by some studies (Harding, 1992; Suettinger, 2003), no in-depth analysis of this facet of the US–China relationship in the post-Cold War period has ever been the subject of scholarly enquiry. By relying on a large body of primary sources (170 interviews, Congressional hearings, and declassified documents from the National Security Archive), this study aims to partially fill this gap in the literature by investigating this strategically sensitive yet neglected area of the Sino–American relationship.

Specifically, through the prism of a sociology of decision-making, the paper seeks to identify the key actors and coalitions of actors that have competed in the making of US export control policy toward China and to capture their policy positions on the nexus between the national security and economic interests at stake in US–China relations. To do so, it partly builds upon the sociology of elite literature and the ‘programmatically approach’, developed in the framework of the research program Operationalizing Programmatic Elites Research in America, which integrates several complementary methods (Genieys, 2010; Genieys and Hassenteufel, 2012, 2015).² First, following Charles Wright Mills (1956), the positional method assesses the configurations of power within an elite by examining who occupies the key positions in the executive and legislative branches. The positions taken into account are, in the executive branch, those having responsibilities for the so called China Desk, East Asian and Pacific affairs, nonproliferation, export controls and international trade in the National Security Council (NSC), the Departments of State, Defense, and Commerce. In the legislative branch, the positions include those of the Congressmen and their congressional staffers in the Armed Services, Foreign Relations/Foreign Affairs, Intelligence, and Banking Committees – both in the Senate and the House of Representatives (HRs). Second, the reputational method aims at identifying through multiple interviews of those actors that have the reputation of being highly influential. Third, based upon Robert Dahl’s decisional method (Dahl, 1961), the time

2 The present work was conducted within the framework of the OPERA research group, funded by the French National Research Agency (ANR-08-BLAN-0032).

period considered is first divided in a number of sub-periods according to the turning points, or key decisions, in the evolution of a policy. A meticulous empirical analysis, based upon large body of primary sources, is then made to assess why and how the policy changes happened (Genieys and Hassenteufel, 2012). A ‘key actor’ is here defined as an individual that cumulates several resources: the position, reputation, and actual influence over policy outcomes in a given policy domain and at a given point in time. A ‘coalition’ is a set of actors coming from a variety of institutions (executive branch, legislative body, and pressure groups) who share a common policy position and seek to influence policy outcomes in a given policy domain.

The paper seeks to demonstrate that, as a consequence of the erosion of the US capacity to control the diffusion of defense-related technology to China in the post-Cold War era, a growing set of actors in the United States (the Run Faster coalition) has reassessed the security/economic calculus in Washington’s relationship with Beijing. While the Control Hawks coalition advocates the implementation of highly stringent export controls because of fears that transfer of sensitive technologies to China would damage US security interests—framing its policy position in the Cold War paradigm of a trade-off between national security and economic interests—, the Run Faster coalition moves beyond this trade-off pressing for the liberalization of controls in order to protect US national security. Specifically, this set of actors advocates the streamlining of export controls to sustain the defense and technological industrial base and thereby maintain American military/technological preeminence vis-à-vis a rising China. It will be shown that changing dynamics at the multilateral, technological, and bilateral levels have given momentum to the Run Faster coalition allowing it to prevail over its rival coalition. In order to substantiate this argument, the paper first provides a cartography of the key actors involved in the making of US export control policy during the Clinton administration, describes the key tenets of each coalition, and demonstrates that the Run Faster coalition drove Washington’s supercomputer export control policy toward China in the 1990s (Section 1). It then investigates the competition in the policy-making process during the George W. Bush administration showing the continued preeminence of the Run Faster coalition in shaping policy outcomes in the 2000s (Section 2). In conclusion, having illustrated how the Obama administration’s export control reform is based upon the key tenets of the Run Faster coalition, the paper assesses the contribution of its findings to the understanding of Sino–American relations

and its potential implications for the future of American military/technological primacy in the twenty-first century.

2 The making of US export control policy toward China during the Clinton administration

2.1 Key actors in the executive branch

During the Clinton administration, the key bureaucratic actors in the making of export control policy were those composing the so-called triumvirate – the Departments of Commerce, State and Defense – with the NSC coordinating the interagency process and acting as a broker when disagreements emerged among the agencies. These actors combined the position, reputation, and influence upon specific policy outcomes that made them the ‘key players’ in the decision-making process. Under the direction of Secretary Ron Brown, the key Commerce Department officials identified in Table 1 took the lead in pushing for the liberalization of export controls. At the same time, the Department of Defense (DOD) assumed a very different role than the one it had played throughout the 1980s, when it was the main veto player against the loosening of export controls (Meijer, 2013a: Ch. 2). As explained in more detail later, the Pentagon came to believe that excessively stringent export controls harm, rather than protect, US national security and therefore began to support the liberalization of controls. As a lobbyist for the computer industry puts it, Secretary of Defense ‘William Perry was a strong proponent of reform because he believed that overly restrictive export controls would undermine the industrial base and technological pre-eminence and ultimately the military superiority of the United States’ (lobbyist, interview, October 2010). The other key officials within the DOD identified in Table 1, including the Director of the *Defense Technology Security Administration (DTSA)*, the Pentagon agency in charge of export controls), shared Secretary Perry’s views. The regional bureau, the Pentagon’s Directorate for the PRC, Taiwan, and Mongolia, tended to rely on the technical expertise of DTSA, and ultimately to defer authority to it, both on individual licensing cases and in the overall export control process.³

3 Randall Schriver, Country Director for PRC–Taiwan, 1995–1997, and then Senior Country Director for the PRC, Taiwan, and Mongolia in the Pentagon, 1997–1998 (interview, April 2010).

Table 1 Key executive branch actors in the 1990s

Name	Position	Year
National Security Council		
Daniel Poneman ^a	Special Assistant to the President and Director for Non-proliferation and Export Controls	1993–1996
Gary Samore ^a	Special Assistant to the President and Director for Non-proliferation and Export Controls	1996–2001
William Clements ^a	Director for Non-proliferation and Export Controls	1993–1995
Maureen Tucker ^a	Director for Non-proliferation and Export Controls	1996–2006
Department of Commerce		
Ron Brown	Secretary of Commerce	1993–1996
William Daley	Secretary of Commerce	1997–2000
William Reinsch ^a	Under Secretary of Commerce for Export Administration	1994–2001
Sue Eckert ^a	Assistant Secretary for Export Administration	1993–1997
Roger Majak	Assistant Secretary for Export Administration	1997–2001
Ian Baird ^a	Deputy Assistant Secretary for Export Administration	1992–2000
Department of Defense		
William Perry	Secretary of Defense	1994–1997
William Cohen	Secretary of Defense	1997–2001
John Deutch ^a	Deputy Secretary of Defense	1994–1995
John Hamre	Deputy Secretary of Defense	1997–2000
Ashton Carter	Assistant Secretary of Defense for International Security Policy	1993–1996
Kenneth Flamm	Principal Deputy Assistant Secretary for Dual Use Technology and International Program	1993–1995
Mitchel Wallerstein ^a	Deputy Assistant Secretary of Defense for Counterproliferation Policy and Senior Representative for Trade Security Policy	1993–1997
David Tarbell ^a	Deputy Under Secretary of Defense for Technology Security Policy and Director of DTSA	1994–2001
Department of State		
Warren Christopher	Secretary of State	1993–1997
Madeleine Albright	Secretary of State	1997–2001
Lynn Davis	Under Secretary for International Security Affairs	1993–1997
John Holum	Under Secretary for Arms Control and International Security Affairs	1998–2000
Thomas McNamara ^a	Assistant Secretary for Political-Military Affairs	1994–1998
Eric Newsom	Assistant Secretary for Political-Military Affairs	1998–2000
William Lowell ^a	Director of the Office of Defense Trade Controls	1994–2003

^aInterviewed by the author.

The Commerce Department and senior officials (mostly political appointees) in the Pentagon tended to share relatively complementary views on the need to engage in an overall reform of the export control system while the State Department tended to resist such reform. Indeed, the key actors in the State Department (Table 1), including those within the Office of Defense Trade Controls (ODTC), were the most reluctant vis-à-vis export control reform throughout the Clinton administration. The State Department's Office for Chinese and Mongolian Affairs (the so-called China Desk) did favor a policy of engagement with China and a more factoring in of broader foreign policy considerations (namely the stability of the bilateral relationship) and economic interests in the making of export control policy toward China. The 'China Desk' therefore advocated for less stringent export controls toward the PRC. However, as the Assistant Secretary of State for East Asian and Pacific Affairs Winston Lord explains, it tended to defer decisions to the bureau within the State Department that had the technical expertise required to address export control policy (i.e. ODTC) and, as a consequence, did not weigh into very heavily in the decision-making process (interview, April 2010).

Above the triumvirate, the key actors in NSC – within the Non-proliferation and Export Controls Directorate (Table 1) – sided with the Departments of Commerce and of Defense supporting the streamlining of export controls. The NSC had a consistent approach throughout the two Clinton administrations, in terms of being 'very pro-liberalization'.⁴ Here too, the regional division of the NSC, the Directorate for Asian Affairs, while supporting the liberalization of controls to China and expressing its views in interagency meetings, tended to defer to the Non-Proliferation and Export Controls Directorate. The Clinton administration was able to overcome interbureaucratic disagreements within the 'triumvirate' over the desirability of export control liberalization because, as Under Secretary of Commerce for Export Administration William Reinsch explains, in the triangular game between the Departments of Commerce, Defense and State, 'if you get two of the three agencies to agree on what to do you can roll the other one,' and this was possible because 'the National Security Council and the President were on our side, [i.e. of the Departments of Commerce and Defense], so for us these [interbureaucratic] fights were worthy because we

4 Interview with James Lewis, export controls official in the Departments of State and Commerce throughout the 1990s (April 2010).

knew that if we moved our way up the ladder we were likely to win' (interview, March, 2010).

2.1.1 Key tenets of the run faster coalition:

- (i) *The decreased capacity of the United States to control defense-related technology diffusion.*

The Run Faster coalition was composed of aforementioned actors in the NSC, the Department of Commerce, and the Pentagon's key political appointees – supported by their backers in Congress and by the high-tech industry. This coalition pressed for the streamlining of US export controls to China (as well as to other destinations) on the basis of the following considerations. First, in the post-Cold War era, the lack of a perceived common strategic threat, as was the Soviet Union during the Cold War, led to increasingly divergent interests within the multilateral institution governing export controls (COCOM), to its consequent collapse in 1994, and eventually to its replacement with a weaker multilateral framework (the Wassenaar Arrangement).⁵ This, in turn, made many US restrictions unilateral and therefore ineffective. Especially in the case of China, the world's fastest growing export market, unilateral export controls would harm the US high-tech industry by putting it at a competitive disadvantage relative to foreign competitors not subject to the same levels of control, without inhibiting the PRC's ability to acquire sensitive technologies from foreign sources. Second, the rapidly increasing innovation rates and technological capabilities of the commercial sector meant that advanced technologies were becoming increasingly available on the commercial market. Coupled with China's growing indigenous capabilities, the worldwide diffusion of commercially developed technologies and the proliferation of alternative sources of supply (the so-called foreign availability of a technology) had made export controls increasingly ineffective, all the more so in the framework of a weak multilateral architecture. As a consequence of these trends, this coalition of actors came to believe that the

5 The post-Cold War multilateral institution governing export controls, the Wassenaar Arrangement – which replaced the Coordinating Committee for Multilateral Export Controls (COCOM) in 1996 – lacks COCOM's unanimity rule that provided the United States, as well as each COCOM member, with the right to veto the individual exports of other member countries. The post-Cold War multilateral export control architecture is therefore a much loser system and is less effective than its Cold War predecessor.

ability of the United States to impose effective controls on dual-use exports had significantly eroded.⁶

(ii) *The commercialization of the Pentagon's industrial base.*

Coupled with the erosion of the US ability to control the diffusion of dual-use technologies, the civilianization (or commercialization) of the Pentagon's industrial base led this coalition to rethink the nature of and the relationship between national security and economic interests in the post-Cold War era. Throughout the Cold War and until the mid-1980s, state-of-the-art technologies applicable to military systems were most often generated by defense contractors funded by governments and then transferred and adapted to the commercial marketplace (examples include the GPS and Internet). Since the 1980s, however, and increasingly so after the end of the Cold War, commercial research and development (R&D) expenditures gradually came to outpace government R&D funding and the gap between the two constantly widened in the post-Cold era (Brzoska, 2006). As a consequence, the center of gravity in the development of dual-use technologies, especially information and communications technologies, shifted from State-led research to the commercial private sector (Walsh, 2009: 133). Since the 1990s, as stressed by a report of the Defense Science Board, the Pentagon has therefore gone 'from relying almost exclusively on a captive US defense industry to depending more on the commercial market, both domestic and international' (DOD, 1999: 27). And the continuing trend toward the globalization of high-tech industries meant that exports had become the key to the growth and good health of the US information and communication technology sector. The Pentagon had therefore grown increasingly dependent on production and R&D by high-tech companies whose primary sales were in the civilian market and in exports.

(iii) *The shifting security/economic nexus.*

The growing reliance of the Pentagon on civilian firms to supply state-of-the-art dual-use technologies had a major impact on the making of export control policy given that 'any significant restriction on exports would likely slow corporate growth and limit the extent to which profits can be put back into research and development on next-generation

6 On the weakening of the US capacity to restrict the diffusion of dual-use technology, see Meijer 2011.

technology' and thereby weaken the technological and industrial base on which the Pentagon depended ever more (DOD, 1999: 27). As Deputy Assistant Secretary of Defense Mitchel Wallerstein stated in a Congressional testimony, 'this situation requires that we be careful not to put US exporters at any unnecessary competitive disadvantage, particularly when export revenues are important contribution to profitability and to financing defense-related R&D' (Senate, 1995: 6).

Accordingly, the Run Faster coalition came to believe that, given the erosion of the capacity of the United States to control the diffusion of defense-related technology and given the growing reliance of the Pentagon on commercially developed advanced technologies, overly stringent export controls, by reducing the export revenues that US high-tech firms could re-invest into R&D on next-generation technologies, would weaken the ability of the Pentagon to access state-of-the-art technologies. As former Special Assistant to the President for National Security Affairs and Senior Director for Asia at the National Security Council Kenneth Lieberthal explains, the regulation that was effective during the Cold War now reduced the national security of the United States by inhibiting the industry's capacity to optimize R&D while at the same time not preventing the PRC from obtaining these technologies (interview, April 2010). Rather than exclusively trying to keep China 'behind' through stringent export controls, the United States should also 'run faster.' Daniel Poneman, Special Assistant to the President and Director for Non-proliferation and Export Controls at the National Security Council, points out that this coalition of actors 'realized that they needed to make a virtue of necessity and that the national security of the US was tied up in learning in how to run faster in developing new technology rather than only trying to stop people from catching up with us' (interview, August 2011). And this required a healthy and vibrant commercial high-tech industrial base. Accordingly, liberalizing export controls (together with efforts to enhance commercial-military integration and to invest in high-tech R&D) was considered necessary to stay ahead in the new post-Cold War technological, military, and economic environment.

The Run Faster coalition therefore moved beyond the traditional Cold War trade-off 'national security versus economics' by reframing the debate in terms of 'protecting national security by pursuing economic interests.' Indeed, as detailed elsewhere (Meijer, 2013a), during the Cold War, the actors involved in the decision-making process assumed a trade-off

between national security and economic interests. In the words of Winston Lord, US Ambassador to the PRC and later Assistant Secretary of State for East Asian and Pacific Affairs, during the Cold War:

in dealing with these sensitive exports there was always a tension between those who were mostly concerned about the security implications of dual-technologies and those who worried about our exports or trade balances. [...] There was a tension between the importance of helping jobs and exports for the Americans *versus* giving China some technologies that could be used against our security interests' (interview, April 2010).

In contrast, as explained by Daniel Poneman, former Special Assistant to the President on nonproliferation and export controls, in the post-Cold War era a growing set of actors (the Run Faster coalition) came to believe that 'the traditional dichotomy of economic prosperity versus security is in fact a false dichotomy' (interview, August 2011). US national security and specifically the ability of the military to maintain the technological/military lead relative to potential competitors, such as China, would therefore be achieved by promoting the economic interests of US high-tech companies rather than by hindering them through stringent export controls, as was the case during the Cold War. Two key Commerce Department officials, Ian Baird and William Reinsch, later characterized this move beyond the paradigm of 'the national security versus economics' trade-off as follow: 'the traditional logic has been reversed – limiting exports *hurts* our national security (by impoverishing companies we depend upon) and enhancing an appropriate level of exports *enhances* our security (by ensuring our military has the means to 'run faster' than its adversaries)' (Baird and Reinsch, 2002: 79–80). This theme, synthesized by Reinsch in 'exports = healthy high-tech companies = strong defense,' is a key rationale of the Run Faster coalition behind the making of US export control policy (Reinsch, 1999: 4).

2.2 Congress and the Control Hawks

On the other side of the spectrum, the Control Hawks attempted to counter the momentum for export control liberalization brought about by the Run Faster coalition. Throughout the 1990s, the Control Hawks coalition comprised key Republican Congressmen and their staffers in both the HRs and the Senate, career officials within the Pentagon who opposed the

policy position of the key political appointees in the Department, as well as newspaper journalists, nonproliferation think tanks, and influential former government officials (see Table 2).

Table 2 Key actors in the 'Control Hawks' coalition in the 1990s

Name	Position	Year
US Senate		
James Strom Thurmond (R-SC)	Chairman of the Armed Services Committee	1995–1999
John Warner (R-VA)	Chairman of the Armed Services Committee	1999–2001
John McCain (R-AZ)	Chairman of the Commerce Committee	1997–2001
Jessie Helms (R-NC)	Chairman of the Foreign Relations Committee	1995–2001
Jon Kyl (R-AZ)	Member of the Committee on Armed Services Member of the Select Committee on Intelligence	1993–1994 1995–2002
Fred Thompson (R-TN)	Chairman of the Governmental Affairs Committee	1997–2001
Richard Shelby (R-AL)	Chairman of the Select Committee on Intelligence	1997–2001
US House of Representatives		
Henry Hyde (R-III)	Member of the International Relations Committee	1993–2007
Duncan Hunter (R-CA)	Chairman of the Subcommittee on Military Procurement of the Committee on Armed Services	1995–2000
Floyd Spence (R-SC)	Member of the Armed Services Committee and Chairman of the Committee on National Security	1995–1998
Think tanks		
Gary Milhollin	Founder and Executive Director of the Wisconsin Project on Nuclear Arms Control	1986–present
Congressional staffers		
William Triplett	Chief Republican Counsel to the Senate Foreign Relations Committee	1997–2001
Edward Timperlake	Professional Staff Member of the Committee on Rules in the US House of Representatives	1996–1998
Former Pentagon officials		
Henry Sokolski*	Deputy for Non-proliferation Policy in the Office of the Secretary of Defense	1989–1993
Stephen Bryen*	Deputy Under Secretary of Defense, co-founder, and first Director of DTSA	1981–1988
Newspaper journalists		
Bill Gertz	Editor, Columnist, and Reporter for the <i>Washington Times</i>	1985–present
Pentagon career officials		
	No specific available information	

*interviewed by the author

Only a relatively limited number of Congressmen, and their congressional staffers, would weigh into the debates over US export control policy toward China. The Control Hawks coalition in Congress was relatively small but was very vocal and effective. In the Senate, the strongest opponents to export control liberalization were in the Committees on Armed Services, Foreign Relations, Governmental Affairs, Commerce, and the Select Committee on Intelligence. In the Senate Banking Committee, which has jurisdiction in the Senate for export controls and was more receptive to export control reform, a number of Republican Senators were supportive of the administration's reform effort, such as Senators Phil Gramm (R-TX), Chairman of the Committee (1995–2000), and Senator Michael Enzi (R-WY), as well as Democratic Senators Tim Johnson (D-SD) and Paul Sarbanes (D-MD) and Ranking Minority Member for the Democrats. The support of the liberalization of controls by Republican Senators Gramm and Enzi indicates how, while the Democrats tended to favor the liberalization of export controls, the main division was in the Republican party. As stressed by James Jochum, Congressional staffer in the Senate Banking Committee (1994–2000), 'the political split on export controls generally lies within the Republican party, it is not a Democrats versus Republicans split. [As a Congressional staffer], I always had to deal with an intra-party issue' (interview, March, 2010). In the HRs, the International Relations Committee (which has jurisdiction over export controls) and the Armed Services Committee were the most influential committees. In particular, Representatives Henry Hyde (R-Ill), Duncan Hunter (R-CA), and Floyd Spence (R-SC) led the anti-liberalization drive in the HRs. The Control Hawks opposition to the liberalization of export controls was rooted in the concern that loosening controls to China would facilitate the modernization of the PLA and thereby threaten US national security. In their view, stopping technologies flow to China was not only possible but necessary to protect US national security. They considered that the Clinton administration's export control policies were giving primacy to economic interests to the detriment of national security, assuming a trade-off between the two. Representative Spence voiced 'his concern that the Administration has placed commercial interests above US national security interests' (HR, 1996). Similarly, for Senator Thompson, 'the current licensing process is flawed because it discounts our national security interests too much in favor of promoting exports' (US Senate, 1998: 2).

An important source of information for Congressmen concerned by the potential diversion of sensitive technology to the PRC was the Wisconsin Project on Nuclear Arms Control, a nonproliferation think tank directed by Gary Milhollin. He wrote several articles stressing how the Clinton administration had sacrificed US national security for economic interests (Milhollin, 2000, 2001). Milhollin also testified numerous times in Congress voicing his concerns over the relaxation of export controls to China (US HR, 1997; US Senate, 1998a). According to several interviewees, information was often leaked by a number of career officials and engineers within DTSA – who were opposed to the policy positions of the political appointees in the Pentagon – to Congressional staffers, the Wisconsin Project, and the press (often to the *Washington Times*).⁷ Two Congressional staffers, William Triplett and Edward Timperlake, wrote the book *Red Dragon Rising: Communist China's Military Threat to America* that accused the Clinton-Gore administration of having ‘sacrificed national security for money [and of having] materially assisted Beijing’s military ambitions’ (1999: 12). According to the *Los Angeles Times* journalist James Mann, Triplett ‘was a master of the well-timed leak [and] spoke regularly to elite newspapers, but also knew how to work with the *Washington Times*, the wire services, or even magazines’ (Mann, 1999: 243). Bill Gertz of the *Washington Times* also wrote a book titled *Betrayal: How the Clinton Administration Undermined American Security* that criticized the Clinton administration’s policies (Gertz, 1999). The ties between the Pentagon’s DTSA career officials, Congressional staffers, Washington-based think tanks, and newspaper columnists allowed the Control Hawks to give a broad media echo to their concerns. Finally, a number of high-profile former Pentagon officials opposed to the liberalization of controls to China were also often called to testify in hearings before Congress, such as Henry Sokolski (Deputy for Non-proliferation Policy in the Office of the Secretary of Defense, 1989–1993) and Stephen Bryen (Deputy Under Secretary of Defense, 1981–1988) (US Senate, 1998a, 1998b).

2.3 The private sector

The major US high-tech companies lobbied the government both individually and through business associations to obtain the liberalization of

7 Interviews with officials in the Departments of Defense, Commerce, and State, and with computer industry lobbyists (March–December 2010).

controls export to China, therefore pressing in the same direction as the Run Faster coalition (although, in their case, exclusively on economic grounds). The computer industry worked primarily through the Computer Systems Policy Project (CSPP) to organize its lobbying effort. The CSPP included the CEOs of the largest US computer companies: Apple Computer, AT&T, Compaq, Cray, Data General, Digital Equipment, Hewlett–Packard, Silicon Graphics, Straus Computer, Sun Microsystems, Unisys as well as the law firm Wilmer, Cutler, and Pickering. According to a computer industry lobbyist, ‘the CSPP was the most effective and visible’ lobbying group on supercomputer export controls and ‘it was aimed primarily at exports to China. [...] The CEOs themselves would meet with members of Congress, with the Commerce and Defense Departments, once met with Clinton and with John Podesta. [...] It was a very effective lobbying campaign [...] because of the connections through the CSPP, through the CEOs, who had access to all of this people’ (lobbyist, interview, October 2010). The CSPP, in turn, coalesced into broader coalitions, so called broad spectrum associations, such as the National Association of Manufacturers, the National Foreign Trade Council, and the Coalition for Employment through Exports. These groups represented a wider range of interests than merely sectoral interests. They tended to focus on the overall reform of US export controls (such as the reform of the Export Administration Act legislation) rather than on the regulatory changes of controls for specific technologies, which were delegated to sectoral business associations (e.g. the CSPP). In addition, throughout the 1990s, the President Export Council, chaired by Presidentially appointed Michael Armstrong, CEO of Hughes Electronics (1992–1997), included CEOs of major US high-tech companies and provided them with a forum in which to discuss export-related matters with high-level officials and from which present policy recommendations (Table 3).

2.4 The policy outcome: loosening supercomputer export controls

Throughout the 1990s, the Run Faster coalition competed with the Control Hawks and pressed for loosening of export controls on both national security and economic grounds. It will be shown that, in the area of supercomputers, the Run Faster coalition was able to overcome the resistance and opposition of the Control Hawks and to significantly liberalize

Table 3 Key business associations

OVERALL EXPORT CONTROL REFORM
National Association of Manufacturers (NAM)
National Foreign Trade Council (NFTC)
Coalition for Employment through Exports (CEE)
OTHER VEHICLES FOR THE INDUSTRY'S LOBBYING EFFORTS
President Export Council (PEC)
SECTORAL BUSINESS ASSOCIATIONS
Computer Systems Policy Project (CSPP)

supercomputer export controls. In 1993, the Run Faster coalition began the relaxation of controls on computer exports to China (and other controlled countries) for computers with a data processing speed of up to 67 million theoretical operations per second, or MTOPS. A declassified briefing paper specifies that this liberalization ‘released computers and related equipment from licensing requirements for which the Commerce Department received ~\$1.5 billion worth of IVL [Individual Validated Export Licenses] applications in 1993’ (DOC, 1994a). Controls on computers were then further liberalized in January 1994 up to 260 MTOPs ‘thereby freeing up most lower-level computers, including many Silicon Graphic, Sun, Hewlett Packard, DEC, and IBM workstations from USG [US government] approval’ (DOC, 1994b). This decontrol released an additional \$69 million worth of computers to China (DOC, 1994a). These regulatory changes started a process of gradual and constant liberalization of the control levels on the export of computers. The control parameters were raised on a regular basis between 1993 and 2002 (Fig. 1).

In 1996, the Commerce Department removed license requirements for supercomputer exports with performance levels up to 2,000 MTOPS and, as shown in Figures 2 and 3, organized target countries into four tiers with increasing levels of controls. This tier system was meant to ‘permit the government to tailor control levels and licensing conditions to the national security or proliferation risk posed at a specific destination’ (GAO, 1998b: 2). Tier 3 countries, in particular, included China, Russia, India, Pakistan, and Israel, where there was a risk of proliferation or diversion. For these countries, a dual control system was established which distinguished between civilian and military end-users and end-uses. HPCs up to 7,000

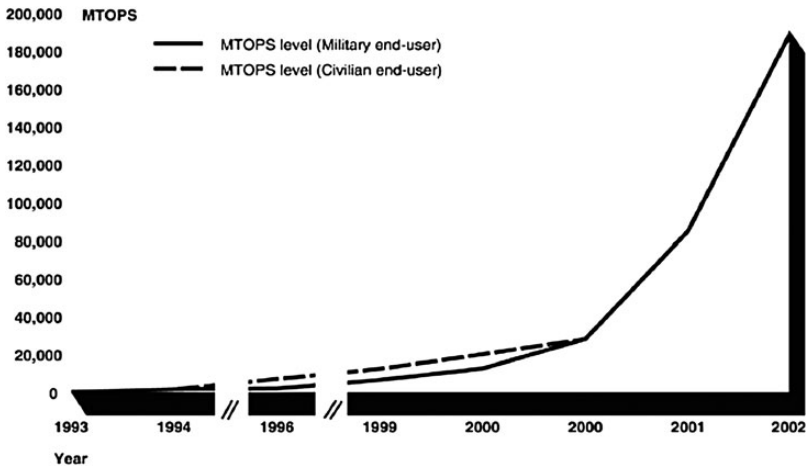


Figure 1 Changes in the US export control threshold for high performance computers, 1993–2002 (measured in MTOPS).

Source: *General Accounting Office (2002) Export Controls: More Thorough Analysis Needed to Justify Changes in High Performance Computer Controls*, August, GAO-02-892.

MTOPS could be exported to civilian end-users without a license, while exports at and above 2,000 MTOPS to end-users of concern for military or proliferation of weapons of mass destruction reasons required a license (Figs. 2 and 3).

Overall, the 1996 liberalization provided ‘significant benefit to the international competitiveness of the US computer industry and [affected] an estimated \$10 billion in exports’ (DOC, 1996: II-2). Indeed, as a consequence of the relaxation of controls, American exports of supercomputers burgeoned throughout the 1990s. In terms of sales to China, between 1997 and 1999, the United States approved the export of 1,924 supercomputers to the PRC (Table 4) (GAO, 1999: 4). China ranked as the largest importer of US HPC between 1996 and 1999 in Tier 3 (GAO, 1998a: 5 and 1999: 15). Russia, Israel, and Saudi Arabia were the next three largest authorized importers of US supercomputers. The volume of computers sold to China exceeded the sum of those exported to the latter three.

2.5 The Run faster coalition’s rationale for streamlining export controls

As shown earlier, the liberalization of supercomputer export controls by the Run Faster coalition affected all countries and was tailored, through

Tier/Countries	Restrictions/Controls	Record Keeping
Tier 1: Western Europe, Japan, Canada, Mexico, Australia, and New Zealand.	No licenses required for exports or re-exports of computers to/among these countries; exports of unlimited MTOPS permitted.	Record keeping by U.S. exporters of HPCs above 2,000 MTOPS required.
Tier 2: South America, South Korea, ASEAN, Hungary, Poland, the Czech Republic, the Slovak Republic, Slovenia, & South Africa.	Licenses required for exports or reexports of HPCs above 10,000 MTOPS	Record keeping and reporting by U.S. exporters of HPCs up to 10,000 MTOPS required.
Tier 3: India, Pakistan, all of the Middle East/Maghreb, all of the states in the former Soviet Union, People's Republic of China (PRC), Vietnam, and the rest of Eastern Europe.	Export licenses are required for exports or reexports of HPCs above 2,000 MTOPS to military end-users or uses, or to nuclear, chemical, biological, or missile end-users or uses; licenses required for HPCs above 7,000 MTOPS to all end-users or uses.	Record keeping and reporting required for all HPCs between 2,000 and 7,000 MTOPS.
Tier 4: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.	No computers are allowed either through direct or indirect trade.	Not applicable.

Figure 2 The tier system (a).

Source: McLoughlin G., Fergusson I., 2005, *High Performance Computers and Export Control Policy*, Washington, DC: Congressional Research Service.

the Tier system, to the national security concerns posed by each individual country. Nevertheless, Tier 3 – and within it China in particular – was the central focus of the reform effort both from a national security and an economic standpoint. As then Director of the Pentagon's DTSA David Tarbell explains, China 'was the central focus for national security. Most of the discussion for China revolved around its military modernization. The computer control were matched precisely with what we estimated were Chinese capabilities. From a national security standpoint, it was entirely driven by China' (interview, May 2010). As already mentioned, supercomputers could indeed be used by the PLA for a broad range of both military and intelligence applications. At the same time, from an

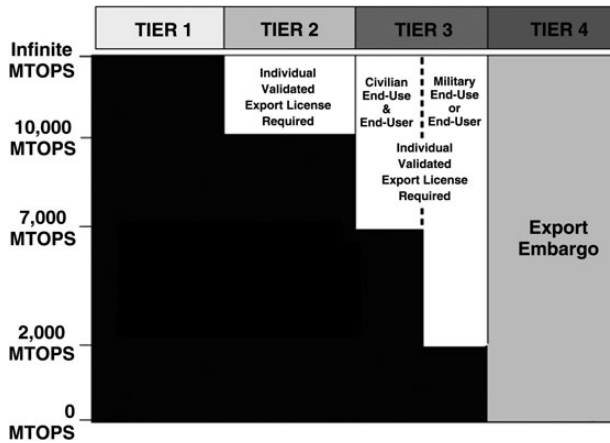


Figure 3 The tier system (b).

Source: adapted from *The Proliferation Primer*, A Majority Report of the Subcommittee on International Security, Proliferation, and Federal Services, Committee on Governmental Affairs, US Senate, January 1998.

Table 4 Computers approved by the US government for export to Tier 3 countries: 18 November 1997–27 August 1999 (total approved exports)

Country	Quantity	Average MTOPs	Highest MTOPs level
China	1,924	3,610.6	24,750
Russia	503	3,624.4	16,063
Israel	458	3,857.8	10,440
Saudi Arabia	212	9,973.2	28,980
United Arab Emirates	191	3,519.6	12,063
Algeria	117	2,228.1	5,460
India	113	3,449.5	11,873

Source: General Accounting Office, 1999, *Export Controls: Statutory Reporting Requirements for Computers Not Fully Addressed*, November, GAO/NSIAD-00-45.

economic perspective, China was also the focal point of interest. Tarbell points out that, throughout the 1990s,

anytime there was a discussion about export reform [...] with the business community it was always about the Chinese market, it was always one of their first talking points from a commercial, economic and

competitiveness standpoint. [...] The opportunities in China in terms of profits, exports, and job creation in the US were the primary motive that led US high-tech industry to push for the liberalization of US export controls (interview, May 2010)

James Jochum, then International Trade Counsel and Legislative Director for Senator Charles Grassley (R-IA), and later Assistant Secretary of Commerce (2001–2005), synthesizes the importance of China in the debates over supercomputer export controls as follows:

In the background, China was really the entire issue. Most of our export controls fell on Tier 3 countries, and so when you are talking about removing export controls, you are really talking about liberalizing controls to Tier 3. You were essentially talking about China. Russia was also in Tier 3, but the most of the exports in Tier 3 were to China. There were India and Russia too [in Tier 3], but China bought more computers than Russia and India combined [cf. Table 4]. So what we are really talking about was the regulatory standard for exports to China. (interview, March, 2010)

Specifically, the Run Faster coalition's decision to liberalize the controls on supercomputer exports to China and other controlled destinations was based on the following interrelated considerations.

First, with the computational capabilities of commercially developed information technology doubling every 18 months, as stated by the so-called Moore's law, Cold War export controls had become outdated.⁸ Richard Van Atta, then Assistant Deputy Under Secretary of Defense for Dual Use and Commercial Programs explains that 'the Moore's law implied that the levels of commercially available computer technology was always pushing beyond the levels of controls, and that the controls were always behind the growth in computing power' (interview, May 2010).

8 Interviews with William Clements, Director of Nonproliferation and Export Controls at the NSC (1993–1995), March 2010; William Reinsch, Under Secretary of Commerce Export Administration (1994–2001), March 2010; David Tarbell, Deputy Under Secretary of Defense for Technology Security Policy and Director of DTSA (1994–2001), May 2010; Maureen Tucker, Chief of Staff to the Assistant Secretary of Commerce for Export Administration (1988–1996), April 2010; Mitchel Wallerstein, Deputy Assistant Secretary of Defense for Counterproliferation Policy and Senior Representative for Trade Security Policy (1993–1997), March 2010.

A second factor was the development of ‘parallel processing’ (or parallel computing).⁹ According to the Congressional Research Service (CRS), ‘by the 1990s, commercial users began to more commonly link several computers with multiple processing capability together’ (CRS, 2005: 3–4). Through this process, called ‘parallel computing,’ several independent computers are linked together by a single system of software, hardware, and network technologies, which allow many microprocessors to work simultaneously. This blurred the difference between supercomputers and mass market computers. Commercially available microprocessors that individually complied with existing export regulations could now be linked to create servers with capabilities well beyond existing supercomputer export control thresholds. The Run Faster coalition therefore concluded that, as parallel processing capabilities were widely available, this had greatly reduced the capacity of the United States to control the diffusion supercomputers and therefore made US export controls increasingly ineffective (Reinsch in US Senate, 1998: 26).

Third, the global diffusion of high computing capabilities meant that China and other countries targeted by US export controls could purchase the controlled items in foreign countries that did not impose the same level of controls than the United States.¹⁰ The microprocessors on which supercomputing relied had indeed become increasingly available on the commercial market and globally widespread, including from countries not supporting US export control policies or outside the multilateral export control regime. The percentage of the world’s 500 most powerful supercomputers employing commercially available microprocessors had grown from ~10% in 1993 to 75% in 1997 (Goodman *et al.*, 1998: 14). And as Under Secretary of Commerce Reinsch (1994–2001) explains, ‘the basic ingredients, the chips, the microprocessors [were] widely available and manufactured all over Asia and Europe by a variety of companies’ (US Congress, 1998: 5). In Asia, beside Japan, with whom the United States had an export control agreement (the ‘Supercomputer Regime’), other countries had become a source for China’s acquisition of computer technology (e.g. semiconductors), such as Taiwan, South Korea and Malaysia (GAO, 2006a: 30). As a consequence, according to William Clements, Director of Nonproliferation and Export Controls at the NSC,

9 *Ibid.*

10 *Ibid.*

‘the chips became ubiquitous, you could not control them. [...] The technological advances simply made the [foreign] availability of computational capability so diffuse that it became impossible to control. [...] You just lost control’ (interview, March, 2010). Similarly, in the words of Under Secretary of Commerce Reinsch ‘however much we would like to have it otherwise, we must not delude ourselves: we cannot control the uncontrollable’ (US HR, 1997: 6).

Finally, given the growing commercialization of the Pentagon’s industrial base, the Run Faster coalition considered that excessively stringent controls would ‘seriously damage our national security by crippling our companies just as our national security establishment’s reliance on them grows’ (Reinsch in US Senate, 1998: 25). In his words, ‘you have the situation where the Pentagon needs IBM more than IBM needs the Pentagon. [...] So the next step is how do you keep IBM healthy and profitable? And there is only one way: exports’ (interview, March, 2010). Accordingly, ‘maximizing our technological leadership in this sector will inevitably have more to do with making sure we are running faster than our adversaries than it will with trying to hold them back’ (Reinsch, 1999: 3). US national security would therefore be better served by liberalizing export controls on supercomputers which would support the health of US high-tech industry and, in turn, its ability to provide state-of-the-art dual-use technology to the US military.

2.6 Growing intercoalitions rivalry: the Cox report

After the Republicans gained the majority both in the HR and in the Senate in the mid-1990s, numerous Congressmen increasingly voiced their concerns over the impact of the Clinton administration’s supercomputer decontrols on China’s military modernization. The issue of technology transfers to PRC became highly politicized and enmeshed in partisan politics thereby polarizing Congress.

The Control Hawks in Congress fiercely criticized the liberalization of HPC export controls. Representative Floyd Spence, Chairman of the Committee on National Security, complained that, since the export control liberalizations, US supercomputers had ‘been inappropriately shipped to military research facilities in China [and] that these unauthorized transfers have been facilitated, if not encouraged, by the administration’s own relaxation of supercomputers export controls’ (US HR, 1997: 1–2). Numerous

hearings were held both in the HRs and the Senate to examine the national security implications of US export control policy on supercomputers and China (US HR, 1997; US Senate, 1997; Congress, 1998; US Senate, 1998). Gary Milhollin, the head of the Wisconsin Project think tank, wrote critical articles in *The Washington Post* such as ‘With Looser Computer Controls We’re Selling Our Safety Short’ (2000). Similarly, in a testimony before the Senate Committee on Governmental Affairs, the Deputy Under Secretary of Defense under Reagan, Stephen Bryen, stated: ‘the sale of supercomputers to China should be regarded as a crazy policy’ (US Senate, 1997: 41).

In 1998, the HR created the Select Committee on US National Security and Military/Commercial Concerns with the PRC to investigate over the allegations reported in the press that, in the aftermath of launch failures of US satellites in China (manufactured by Loral and Hughes), unauthorized information had been transferred to Chinese engineers. As a former Congressional Staffer of Senator John McCain puts it, ‘once it became known, Congress went at war’ (interview, October 2010). The mandate of the so-called Cox Committee, chaired by Representative Christopher Cox (R-CA), did not focus exclusively on satellite launches but on any illicit technology transfer and diversion to the PRC, including supercomputers. The Committee released its final report on US technology transfers to China, the so-called Cox Report, in January 1999, which remains classified. The unclassified version of the report was released in May 1999. Among its main conclusions, the report stated that, in the aftermath of the failed satellite launches, the firms Hughes and Loral had transferred missile design and information know-how to the Chinese without the US government required export license. Furthermore, China was believed of having pursued large-scale intelligence collection, espionage and interactions with US scientists from the Department of Energy’s national laboratories and stolen classified information on the most advanced US thermonuclear weapons. Overall, the Cox report accused China of having illegally obtained US missile, space and nuclear technology in order to improve the PLA military and intelligence capabilities (Kan, 1999). As far as HPCs were concerned, the report stated that the relaxation of export controls on supercomputers to China had provided the PLA with increased computing power and speed and that the US government had no effective way to verify that supercomputers reportedly acquired for commercial purposes were not diverted to military end-uses because of the Chinese

- (a) Legislation to require the conduct of a comprehensive review of the national security implications of HPCs including empirical testing of the extent to which national security related operations could be performed using clustered, massively-parallel processing or other combinations of computers;
- (b) An annual comprehensive threat assessment of the exports of supercomputers to the PRC by the US intelligence community;
- (c) Legislation requiring the establishment by the PRC of an open and transparent end-use verification for HPCs; failure by the PRC to cooperate would result in actions by the US Government such as lowering the performance level of HPCs that may be exported to the PRC and/or the denial of export licenses for computers destined to the PRC;
- (d) Legislation to require the Executive branch to encourage other computer-manufacturing countries, especially those countries that manufacture HPCs, to adopt similar policies toward HPC exports to the PRC.

Figure 4 Box: The cox report's recommendations on supercomputer expert controls.

government resistance to allow post-shipment on-site verification visits (Fig. 4).¹¹

In response to the Control Hawks' vocal concerns over the risks of supercomputer diversion to military end-users and end-uses in China, Congress passed the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 1998. The legislation (in particular Section 1211) tightened the informational requirements related to supercomputer exports controls to Tier 3 countries (US Congress, 1997). First, it established requirements for advanced notification by the exporters as well as for post-shipment verifications. Second, in order to raise liberalize supercomputer export controls, the President would have to justify the new control parameter in a written report to be submitted to Congress. Third, the President would have the authority to move countries out from Tier 3 to other Tiers, with a prior notification to Congress, but not if (i) the country was nuclear weapons state and not a member of NATO and (ii) the country was a signatory of Non-Proliferation Treaty and listed in Annex 2 of the Comprehensive Test Ban Treaty (US Congress, 2000). In the words of William Greenwalt, Professional Staff Member in the Senate Armed Services Committee, this third provision was 'directed right at the Chinese,' at making sure that China would not be moved out from Tier 3 (interview, May 2010). In fact, according

11 The conclusions of the Cox Report were however controversial and a 1999 DOC report denied many of its findings: 'there is no evidence that the computers being used [in Chinese nuclear laboratories] are US made HPCs or that they have been diverted to such end-uses. [...] The [Cox] report cites a number of hypothetical cases where the Chinese could be using computers for military purposes. Most of these applications could be performed on commercially available workstations and personal computers. They do not require supercomputers' (DOC, 1999: 13).

to a number of interviewees, the whole NDAA provisions on export controls *de facto* targeted China. Although the language of the legislation did not specifically mention China, the focus of the NDAA was clearly ‘an anti-China issue’ (interviews with Greenwalt and with lobbyist, October 2010). The Run Faster coalition strongly opposed the NDAA requirements. Under Secretary of Commerce Reinsch expressed his discontent in a testimony before the National Security Committee, chaired by Fred Thompson, arguing that these provisions made ‘no technical sense’ and were an attempt by the Congress to ‘micromanage export control policy’ (US HR, 1997: 6–7). Similar concerns were expressed by key political appointees in the Pentagon (Wallerstein in US Congress, 1997). Nevertheless, in 1999, despite the Run Faster coalition’s opposition, the Congress passed the 2000 NDAA which further required the President to submit a report to Congress that would (i) assess the cumulative impact of licenses of military-related technologies granted to countries and entities of concern and (ii) conduct a comprehensive review of the national security implications of exporting supercomputers to China.

Nonetheless, these legislative provisions did not give to the Congress a veto right on export control liberalizations. They just imposed upon the President an informational requirement. In fact, despite the political upheaval generated by the Cox Committee, the acrimonious tensions over the various NDAA provisions, and the attempts by the Control Hawks to reimpose stringent restrictions on supercomputer exports, the liberalization of computer controls continued in the last years of the Clinton administration. Indeed, throughout 1999 up until January 2001, the distinction between civilian and military end-users was dropped and the steady liberalization of supercomputer export controls continued, raising the thresholds up to 85,000 MTOPs (cf. Fig. 1). The Run Faster coalition was therefore able, despite the opposition of the Control Hawks, to pursue the liberalization of supercomputer export controls to China, and other Tier 3 countries, until the very last month of the Clinton administration – which continued apace during the George W. Bush administration.

3. The making of US export control policy toward China during the George W. Bush administration

The Bush administration’s first change to HPC export controls was announced on 2 January 2002, and took effect on March 5. The controls threshold for Tier 3 countries (such as China, Russia, and India) was raised from 85,000 to

190,000 MTOPs (Fergusson and McLoughlin, 2006: 13). Having described the opposition of the Control Hawks to this loosening of US supercomputer export controls, this section examines the changing bureaucratic politics of the Bush administration. It will be shown that despite an overall more conservative approach to export control policy of the Bush administration relative to its predecessor, and despite initially strong interagency disagreements, a consensus gradually emerged within the interagency debates on supercomputer export controls around the key tenets of the Run Faster coalition. This, in turn, eventually resulted in a liberalization of US export controls on supercomputers that continued in the second half of the 2000s, thereby attesting the preponderance of the Run Faster coalition over the Control Hawks in the first decade of the twenty-first century.

3.1 The control hawks' opposition to the liberalization of controls

Several key Control Hawks – most notably in Congress (see Table 5) – opposed the liberalization of export controls to China throughout the 2000s, as they had done in the 1990s. Assistant Secretary of Commerce for Export Administration (2003–2006) Peter Lichtenbaum specifies that within Congress ‘there was a lot of uncertainty regarding Chinese military intentions and a desire to err on the side of caution when exporting sensitive technologies the Chinese military might be able to get some advantage from.’¹² According to William Reinsch, President of the NFTC (2001–present), ‘the administration came under pressure on the Hill, from [the Chairman of the House International Relations Committee (R-IL, 2001–2007)] Henry Hyde among others, to do something about China. Hyde was in the group of very conservative Republicans who supported much stronger controls and pressed the administration to do something about that’ (interview, March, 2010). During a Congressional hearing, Republican Senator Fred Thompson (R-TN), member of the Select Committee on Intelligence (2001–2002) and former Chairman of the Governmental Affairs Committee (1997–2001), strongly criticized the two core tenets of the Run Faster coalition brought forward to justify the liberalization of supercomputers: first, the growing inability of the United States to control the diffusion of supercomputer-related technology and, second, the idea that excessively

12 Peter Lichtenbaum, interview, 6 April 2010.

Table 5 Key Control Hawks in congress during the 2000s

Name	Position	Year
US House of Representatives		
Henry Hyde (R-IL)	Chairman of the Committee on International Relations (renamed Foreign Affairs Committee since 2007)	2001–2007
Duncan Hunter (R-CA)	Chairman of the Committee on Armed Services	2003–2007
Dana Rohrabacher (R-CA)	Chairman of the Space and Aeronautics Subcommittee of the Science Committee	1997–2005
US Senate		
John Warner (R-VA)	Chairman of the Armed Services Committee	2003–2007
Richard Shelby (R-AL)	Chairman of the Committee on Banking, Housing, and Urban Affairs	2003–2007
Jon Kyl (R-AZ)	Chairman of the Republican Policy Committee	2003–2007
Richard Lugar (R-IN)	Chairman of the Foreign Affairs Committee	2003–2007

stringent export controls would undermine the ability of the United States to run faster than its competitors and, thereby, US national security. On the first point, he stated that with ‘our greatly liberalized export policy with regard to dual-use items and, in particular, high performance computers [...] we continue to go down the same path blindly,’ ‘with industry pounding on our doors every day, trying to liberalize export controls further, arguing that there is no need to try to control anything, ever, anymore, anywhere. We are talking about Tier 3 countries here. If really you cannot control anything anymore, why control Tier 4 countries? Why not go ahead and send computers to Syria and Libya, if, in fact, there is nothing we can do at any stage?’ (Thompson, 2001: 3–5). On the second point, he stressed that ‘it is even more difficult to believe [the] argument that the US military will be harmed if US firms can’t reinvest these marginal profits gained from Tier 3 sales back into R&D programs that might produce military-ready ‘off the shelf’ technology. This makes little sense.’¹³ Similarly, in 2002, Gary Milhollin, Director of the Wisconsin Project on Nuclear Arms Control think tank, voiced his concerns that ‘there are virtually no longer any meaningful controls on the export of high-performance computers. [...] The result is that America will have given up its advantage over other countries in a vital strategic technology’ (2002: 1073). However, as detailed later, despite the initial

13 *Ibid.*

opposition of the Control Hawks, a consensus gradually emerged within the administration over the need to change supercomputer export controls in line with the key tenets of the Run Faster coalition.

3.2 The bureaucratic politics of the Bush administration

As previously shown, in the 1990s, the position of the Pentagon and the broader bureaucratic dynamics in the making of US export control policy had changed substantially relative to the 1980s. The senior officials within Pentagon and the NSC sided with the Commerce Department in supporting the streamlining of US export controls. Under the G. W. Bush administration, the bureaucratic politics within the triumvirate partly returned to a more 'traditional' triangular pattern, with the Pentagon being in favor of more stringent controls than the Commerce Department, and the State Department often acting as a broker between the two. According to former Under Secretary of Commerce William Reinsch (1994–2001) and then President of the National Foreign Trade Council (2001–present), under the Bush administration, the Commerce Department had less incentives to conduct interbureaucratic fights 'as going up the ladder was not going to produce a victory' given the resistance of the Pentagon and the NSC (interview, March, 2010). Furthermore, the Commerce Department itself signaled a somewhat more conservative approach than during the previous administration by changing its title, in 2002, from Bureau of Export Administration to Bureau of Industry and Security. According to James Jochum, Assistant Secretary of Commerce for Export Administration (2001–2003), the name of the bureau was changed in order 'to reflect the fact that even though we were in the Commerce Department, our mandate was national security-driven' (interview, March, 2010).

3.2.1 Interagency debates over supercomputer exports to China: toward a consensus.

Just like in the 1990s, the deliberations over supercomputer export controls affected a broad range of countries and were tailored, through the tier system, to the national security concerns posed by each individual country. Nevertheless, Tier 3 – and within it China in particular – was the key focus both from a national security and from an economic standpoint. The Assistant Secretary of Commerce for Export Administration (2001–2003) highlights the economic relevance of China in the interagency discussions over loosening supercomputer export controls: 'the whole debate really was

about China. So from a commercial standpoint, the emerging market in China was a huge issue' (interview, March, 2010). China was indeed the largest single export market among the controlled country group in the early 2000s, with over 79% of the total and Russia ranking a distant second with 11% of the total (DOC, 2002: 110). At the same time, within the DOD, China was also seen as a core security concern in the debates of supercomputer export controls, as attested by the Pentagon's annual reports on the modernization of the PLA (DOD, 2007) by former DOD officials' accounts. Roy Kamphausen, China Branch Chief in the Directorate for Strategic Plans and Policy (J5) of the Joint Staff (2001–2003) and then Country Director for China, Mongolia, Hong Kong, and Taiwan in the Office of the Secretary of Defense (2003–2004), characterizes the Pentagon's view of the PLA's modernization in the early 2000s as follows: 'that was a period of time in which China's military modernization was becoming of more concern to the Pentagon, and in particular the idea that China was wanting to implement Network Centric Warfare, which was essentially how to use information technology to improve situational awareness and cue targeting systems, and in the end result in much more accurate targeting and destruction. [...] The concern was that [through the acquisition of dual-use technologies] they would be in a much better position to facilitate their transition to information-centered warfare' (interview, March, 2010). Similarly, according to the Director of the State Department's Office of Conventional Arms Threat Reduction and representative of the United States at the Wassenaar Arrangement (2002–2008), initially 'the Department of Defense, and specifically the Defense Technology Security Administration [DTSA, the agency in charge of export controls], was strongly opposed to transfers of any sophisticated computer technology, including software, to the PRC. China was the red flag that the opponents of changes to controls would waive' (interview, April 2010).

Over time, however, the various departments came to share the view that the existing export control thresholds were not workable and the Pentagon agreed that such controls had become ineffective.¹⁴ After numerous interagency meetings, the Pentagon came to the view that excessively stringent controls would be ineffective and potentially counterproductive in terms of weakening the US high-tech industrial base and that they should therefore be focused exclusively on 'chokepoints of technology', namely those technologies that the Chinese were not yet able to produce

14 Interviews with officials in the Departments of State and Commerce (March and April 2010).

and that only the United States could supply and therefore effectively control.¹⁵ The supercomputers that fell into the category of ‘chokepoint’ technology were only those at the extremely high MTOP levels, which were not available on the commercial market. Realizing the need to take into account the technological and industrial dynamics in the computer market and to maintain effective export controls, the Pentagon therefore consented to the liberalization of supercomputers while assuring that the highest-end systems, those above the 190,000 MTOPs threshold, would still be controlled (see Fig. 1).

3.3 Key considerations in the streamlining of supercomputers export controls

A consensus therefore gradually emerged among the key actors of the Bush administration (Table 6) over the need to streamline US supercomputer export controls to Tier 3 countries in line with the key tenets of the Run Faster coalition. Indeed, the considerations that drove the loosening of these controls echo very closely those that shaped US policy in the 1990s.

First, the rapidly and continuously increasing computers’ performances, described by the Moore’s law, required to adapt outdated US export controls to the rapid advancement of technology by raising the control threshold in line with the evolutions of worldwide available computing power.¹⁶

Second, the administration considered that the effectiveness of US export controls was being eroded by market and technological changes in the microprocessor and computer industries (GAO, 2006b: 1). As noted earlier, with parallel processing, microprocessors that individually complied with US export regulations could be linked together to create servers with computing capabilities that approach those of a supercomputer and breach US export control thresholds.¹⁷ Accordingly, as a General Accounting Office

15 Interviews with officials in the Departments of Defense and Commerce (March and December 2010).

16 Interviews with Karan Bhatia, Chief Counsel in the Department of Commerce’s Export Administration Bureau (2001–2002), then Deputy Under Secretary for Industry and Security from 2002 to 2003 (October 2010), and Robert Joseph, Special Assistant to the President and Senior Director for Proliferation Strategy, Counter-Proliferation and Homeland Defense at National Security Council from 2001 to 2005 (November 2010).

17 The impact of parallel processing on the computer liberalizations in the 2000s was stressed by James Jochum, Assistant Secretary of Commerce for Export Administration from 2001 to 2003 (March 2010) and Matthew Borman, Deputy Assistant Secretary of Commerce of Export Administration (2001–present) (December 2010). See also General Accounting Office, 2006.

Table 6 Key executive branch actors in the 2000s

Name	Position	Year
National Security Council		
Maureen Tucker ^a	Director for Non-Proliferation and Export Controls	1996–2006
Angelo Chang ^a	Director for Counterproliferation Strategy	2006–2008
Department of Commerce		
Kenneth Juster	Under Secretary of Commerce for Industry and Security	2001–2005
David McCormick ^a	Under Secretary of Commerce for Industry and Security	2005–2006
Mario Mancuso ^a	Under Secretary of Commerce for Industry and Security	2007–2008
Peter Lichtenbaum ^a	Assistant Secretary for Export Administration	2003–2006
Christopher Padilla ^a	Assistant Secretary for Export Administration	2006–2007
Matthew Borman ^a	Deputy Assistant Secretary for Export Administration	2001–present
Bernard Kritzer ^a	Director of the Commerce Department's Office of Strategic Trade and Foreign Policy Controls Director of the Office of National Security and Technology Transfer Controls	2002–2006 2007–2008
Department of Defense		
Douglas Feith	Under Secretary of Defense for Policy	2001–2005
Eric Edelman	Under Secretary of Defense for Policy	2005–2009
Lisa Bronson	Deputy Under Secretary for Technology Security Policy and Director of DTSA	2001–2005
Beth McCormick ^a	Deputy Under Secretary for Technology Security Policy and Director of DTSA Deputy Director (August–September) and then Director (from October) of DTSA	2007–2008 2005–2006
Department of State		
John Bolton	Under Secretary of State for Arms Control and International Security John Bolton	2001–2005
Francis Record ^a	Acting Assistant Secretary of State for International Security and Nonproliferation	2005–2006
John Rood	Assistant Secretary of State for International Security and Nonproliferation	2006–2007
Christian Kessler ^a	Director of the State Department's Office of Conventional Arms Threat Reduction	2002–2008

^aInterviewed by the author.

report puts it, the existing export control thresholds for supercomputers were 'not effective in limiting countries of concern from obtaining high performance computing capabilities for military applications' (GAO, 2000: 20).

Third, and relatedly, the global diffusion of technology and the foreign availability of supercomputer components also contributed to make US export controls increasingly ineffective. In the words of Maureen Tucker, Director for Non-Proliferation and Export Controls at the National Security Council (1996–2006), ‘the ability to control effectively [the diffusion of technology] was very key in those discussions. And the more widespread the technology, the less effective the controls. There was a general recognition that the technology was outstripping our ability to control it effectively’ (interview, March, 2012).

Fourth, China’s growing indigenous capabilities in the field of supercomputing was an additional factor that weakened the effectiveness of existing US export controls and was therefore taken into consideration in the liberalization of controls.¹⁸ In the early 2000s, China supercomputing capabilities significantly increased. In 2003, for instance, several supercomputer centers, the largest of which being the Computer Network Information Center at the Chinese Academy of Sciences, provided China with the domestic capability to build fast supercomputers. By November of that year, China had nine supercomputers on the Top500 list.¹⁹ Its most powerful HPC was the DeepComp 6,800, based on a commodity cluster model and built by the Chinese Legend Group Corporation. It ranked 14th on the Top500 list of most powerful supercomputers, preceded by supercomputers deployed in the United States and Japan. Francine Berman, then Director of the San Diego Supercomputer Center (2001–2009), stated before the US–China Commission that ‘the rapid march of technology is perhaps the largest factor affecting supercomputing in China. With the success of commodity cluster supercomputers, which China can build [...] China has a growing supercomputing capability, increasingly independent of US export policies’ (USCC 2004: 144–145).

Finally, in line with a key tenet of the Run Faster coalition, the loosening of the controls on supercomputer exports was also based upon the belief that excessively stringent controls, by reducing the export revenues that US high-tech firms could reinvest into R&D on next-generation technologies, would weaken the ability of the Pentagon to access state-of-the-art

18 Matthew Borman, Deputy Assistant Secretary of Commerce for Export Administration (2001–present), interview, December 2010.

19 www.top500.org.

technologies. Streamlining the current export control system was therefore deemed necessary to sustain the ability of the United States to maintain its technological/military lead and to run faster than potential competitors. In other words, overly restrictive export controls would hamper the ability of the United States to maintain a technological/military edge and thereby weaken US national security. For Matthew Borman, then Deputy Assistant Secretary of Commerce of Export Administration (2001–present), ‘the consequence of continuing to control [supercomputers] at those lower levels would have been adverse in an indirect way to the national security and economic security because you are disadvantaging US companies, which could ultimately impact their ability to provide the US with high performance computers for national security applications’ (interview, December 2010). The Director of the National Security Agency (2001–2005) and then of the Central Intelligence Agency (2006–2009), General Michael Hayden, confirms that given that the NSA is highly dependent upon HPCs for cryptanalysis (breaking of codes) and cryptography (making of codes), the issue of supercomputer export controls was ‘very important for the NSA. In essence, we had to decide what would be better for the NSA. We decided that the actual level of restrictions countered the interests of the NSA. The limits were so much hurting the computing industry that it would be better to export higher quality machines if this meant the better health of the US industrial base’ (interview, December 2010). The Pentagon and its cryptologic agency, the NSA, therefore supported the change in export control regulation in order to sustain the health of the Pentagon’s commercial industrial base and thereby to protect US national security.

In sum, the combination of increasingly ineffective export controls on supercomputers – due to the technological dynamics in the computing market, to China’s growing indigenous capabilities, and to the foreign availability of key components from non-US suppliers – and the need to protect US national security by supporting the health of the high-tech industrial base on which the Pentagon relied drove the liberalization of supercomputer exports to China during the Bush administration.

3.4 The computer industry’s interests and lobbying efforts

Just like in the 1990s, the computer industry lobbied the government to loosen supercomputer export controls through the Computer Science Policy Project (CSPP, see Table 3) but also through its subsidiary, the

Computer Coalition for Responsible Exports (CCREs).²⁰ The CCRE had been created in 1999, in the aftermath of the 1998 NDAA. It included the CSPP's companies and a number of trade associations, such as Apple, Compaq, Data General, Dell, Hewlett-Packard, IBM, Intel, NCR Corporation, Silicon Graphics, Sun Microsystems, Unisys, the American Electronics Association, the Computer and Communications Industry Association, and the Information Technology Industry Council (ITI). As explained by a lobbyist involved in these deliberations, the computer industry through the CSPP 'did a very good job of sitting down with the White House and with the Defense Department, at high levels, to talk about controls' (interview, October 2010). While the CSPP's CEOs had meetings with senior officials, the CCRE was meant as a subsidiary, as a separate group to lobby lower echelons of the bureaucracy where the more technical issues related to supercomputer export controls would be discussed. The industry's key arguments for convincing the administration to liberalize HPC export controls were the constantly increasing computational capabilities of computers, the 'uncontrollability' of supercomputers because of their foreign availability and the need not to put the US industry at a competitive disadvantage relative to foreign competitors (Hoydysh, 2001: 24–33).

In 2006, the Bush administration pursued the streamlining of supercomputer export controls by setting a new control threshold for defining a 'supercomputer' and a new formula for calculating computer performance that would replace the MTOPs metric.²¹ This further liberalization completed the changes made to supercomputer export controls in the 1990s and early 2000s and removed most obstacles to the computer industry's exports to China, except for the most powerful supercomputers used in critical national security applications by the Pentagon and the Department of Energy's laboratories. In the words of a lobbyist for the computer industry, the export controls on supercomputers were liberalized 'to such a point that it basically took care of most of the licenses; the number of licenses dropped dramatically. Very little [computer exports now] require a license' (interview, October 2010). The streamlining of American export controls in the 2000s had a significant impact on US supercomputer exports to China. The

20 Interviews with lobbyists for the computer industry, October 2010. On October 2005, the CSPP changed its name to Technology CEO Council.

21 The new formula was Adjusted Peak Performance, expressed in weighted Teraflops.

General Accounting Office stressed, in a 2002 report, that the liberalizations of controls on supercomputers that had taken place in the Clinton and Bush administrations resulted in a ‘nearly thousandfold increase’ in the export control threshold over the eight-year period stressing that ‘most of these changes have occurred over the last 2 years,’ referring to Clinton’s 2000–2001 and Bush’s 2002 liberalizations (GAO, 2002: 6). The annual report of the US–China Economic and Security Review Commission (USCC) also emphasized the fact that by 2002 the Commerce Department’s licensing statistics suggested ‘that most of the trade in high performance computing is no longer licensed and monitored’ (USCC, 2002: Ch. 10). In 2000, only 23 license applications for controlled computers were approved to China for a total of \$10,939,033, and in 2001, two applications were approved for a total of \$3,942,456. These figures attest the scale of the liberalization of super-computer export controls to the PRC.²² The successive loosening of HPC export controls in 2002 and 2006 eliminated, in the words of a lobbyist, ‘most of the stress from the system’ (interview, October 2010). This testifies the continued ability of the Run Faster coalition to prevail over the Control Hawks in the making of supercomputer export controls to China in the post-Cold War era.

4. Conclusion

Through a sociology of decision making and a strong focus on primary sources, this paper has sought to examine the evolving competition between the coalitions of state and societal actors involved in the making Washington’s export control policy toward Beijing. The two coalitions cut across bureaucratic players (including both political appointees and career officials), Congressmen and their staffers, business representatives, and the media. The Run Faster coalition comprises key actors in the NSC and the Department of Commerce, a number of senior political appointees in the Pentagon, as well as a limited number of Congressmen (both Democrats and Republicans), with the US high-tech industry and its business associations pressing in the same direction of these governmental officials. On the other side of the spectrum, the Control Hawks include a number key Republican Congressmen and their staffers in both the HRs and the

22 *Ibid.* The number of license applications and the value of the licensed trade in computer were lower than the previous year because the liberalization of controls on computer exports to China meant that less transactions required licenses.

Senate, DOD career officials, nonproliferation think tanks, newspaper journalists, and influential former government officials. These two coalitions have acutely diverging perspectives of the nexus between the national security and economic interests at stake in US–China relations. On the one hand, the Control Hawks frame their argument in the Cold War paradigm of a trade-off between national security and economic interests. On the other, because of the erosion of the US capacity to restrict the diffusion of defense-related technology and of the commercialization of the Pentagon’s industrial base, the Run Faster coalition reassesses the security/economic calculus in the making of US policy toward China by moving beyond the trade-off between the two. In the post-Cold War era, although the Control Hawks were able to impose additional informational requirements for export control changes, the Run Faster coalition prevailed and was able to pursue a major liberalization of supercomputer export controls to China during the 1990s and 2000s.

The Obama administration’s reform of the American export control system further attests the growing tendency in Washington to move beyond the Cold War trade-off between national security and economics in US strategic trade with potential competitors (for details on this reform, see [Meijer, 2013b](#)). The Obama administration’s reform initiative builds upon a core premise of the Run Faster coalition, namely that ‘the Cold War mentality of ‘Fortress America’ cripples our ability to confront the very real dangers of altered world conditions [...]. The United States runs the risk of becoming less competitive and less prosperous [and] we run the risk of actually weakening our national security’ ([National Research Council, 2009](#): 2). The United States intends to ensure the maintenance of its military/technological preponderance by dismantling the so-called Fortress America mentality and by erecting ‘higher walls around fewer items’, namely on a narrowed down set of critical items that the United States can still effectively control.²³ In other words, Washington seeks to control less in order to control better. Streamlining the export control bureaucratic process allows to concentrate and focus the human and financial resources of the government on controlling the American ‘crown jewels’, namely

23 Interviews with officials from the Departments of State, Defense, and Commerce, and with lobbyists for the defense and high tech industry, March–December 2010, July 2011, and November 2013, Washington, DC.

those critical goods and technologies that are at the foundation of American military primacy.

Since the dissolution of the USSR, the shifting dynamics at the multilateral, technological, and bilateral levels examined in this paper have therefore coalesced in giving momentum to the Run Faster coalition in its competition with the Control Hawks and led to its relative predominance over the Control Hawks in the twenty-first century.²⁴ Specifically, these trends include the weakening of the multilateral institution governing export controls, the worldwide diffusion of technology, China's expanding indigenous capabilities, and the growing pressures of the US high-tech industry that ensued from rising US–China economic interdependence. As forcefully emphasized by Stephen Bryen, former Deputy Under Secretary of Defense (1981–1988) and Commissioner on the US–China Economic and Security Review Commission (2001–2005), who had been one of the most vocal advocates of stringent export controls throughout the 1980s and 1990s: ‘the kind of paradigm that we developed to deal with the Soviet Union cannot be applied to China. Trying to do that is a lost cause. And the potential today of using export control mechanisms to protect our interests *vis-à-vis* China is minimal, if it exists at all. The US government no longer has an ability to use export controls to control anything, or almost anything’ (interview, November 2010). The findings of this article have major consequences for Sino–American relations and, potentially, for the prospects of US military/technological dominance in the twenty-first century. First, this study demonstrates that the Cold War assumption that technology controls were a *conditio sine qua non* for maintaining US military dominance *vis-à-vis* its strategic competitors has collided with the geopolitical, economic, and technological realities of the post-Cold War era. The fact that potential competitors have access to commercially developed dual-use technology on the global markets means that, in order to outcompete their adversaries, the military and the defense contractors have to complement investments in R&D and production activities in military-related technologies with excelling at being the first to integrate commercially available advanced technologies into military systems. The overlapping and intertwining of the logics of military competition and economic interdependence at play in US–China relations attest the growing complexity of interstate rivalry in a globalized

24 For a cross-sectoral comparison of the relative influence of the two coalitions in the areas of satellites and information/communications technology export controls, see [Meijer 2013a](#).

economy. Second, in the longer term, a potential consequence of these trends could be, as stressed by a report of the Pentagon's Defense Science Board, the leveling of the international military/technological playing field which would pose a 'direct challenge to *the* fundamental assumption underlying the modern concept of US global military leadership: that the United States enjoys disproportionately greater access to advanced technology than its potential adversaries' (DOD, 1999: 29). Nonetheless, the extent to which the security, technological, and economic dynamics examined in this article will erode American primacy in world politics and eventually lead to its decline in the face of a rising China remains to be seen.

References

- Baird, I. and Reinsch, W. (2002) 'Does China matter to the health of the US Economy?', in K. Butts and E. Hughes (eds), *Economics and National Security: The Case of China*. Carlisle, PA: US Army War College.
- Brozoska, M. (2006) 'Trends in global military and civilian research and development and their changing interface', in *Proceedings of the International Seminar on Defence Finance and Economics*. New Delhi, India.
- Clarke, D. and Johnston, R. (1999) 'US dual-use exports to China, Chinese behavior, and the Israel factor: effective controls?', *Asian Survey*, 39(2), 193–213.
- Congressional Research Service. (2005) High performance computers and export control policy: issues for congress.
- Dahl, R. (1961) *Who Governs? Democracy and Power in an American City*. New Haven: Yale University Press.
- Fergusson, I. and McLoughlin, G. (2006) *High Performance Computers and Export Control Policy: Issues for Congress*. Washington, DC: Congressional Research Service.
- Genieys, W. (2010) *The New Custodians of the State: Programmatic Elites in French Society*. New Brunswick, NJ: Transaction Publishers.
- Genieys, W. and Hassenteufel, P. (2012) 'Qui gouverne les politiques publiques? Par-delà la sociologie des élites', *Gouvernement et action publique*, 2(2), 89–115.
- Genieys, B. and Hassenteufel, P. (2015) 'The Shaping of the New State Elites. Healthcare Policymaking in France Since 1981'. *Comparative Politics*, 47(3), forthcoming.
- Gertz, B. (1999) *Betrayal: How the Clinton Administration Undermined American Security*. Washington, DC: Regnery.
- Goodman, S., Wolcott, P. and Homer, P. (1998) *High-Performance Computing, National Security Applications, and Export Control Policy at the Close of the 20th Century*. CISAC, Stanford: Stanford University.

- Guo, X. (2006) 'Blockade on China or the United States? US regulatory policies on space technology exports to China', *China Security*, 2(1), 73–83.
- Harding, H. (1992) *A Fragile Relationship. The United States and China Since 1972*. Washington, DC: The Brookings Institution Press.
- Hoydysh, D. (2001) Statement in *Establishing an Effective, Modern Framework for Export Controls* (Hearing).
- Johnson-Freese, J. (2000) 'Alice in Licenseland: US Satellite Export Controls since 1990', *Space Policy*, 16(3), 195–204.
- Kan, S. (1999) *China's Technology Acquisitions: Cox Committee's Report – Findings, Issues and Recommendations*. Washington, DC: Congressional Research Service.
- Mann, J. (1999) *About Face: A History of America's Curious Relationship With China from Nixon to Clinton*. 1st edn. New York: Alfred Knopf.
- Meijer, H. (2011) 'Controlling the Uncontrollable? US Dual-Use Export Controls in the Post-Cold War Era', *Fiche de l'IRSEM*, Strategic Research Institute of the French Military Academy. Available at: http://www.defense.gouv.fr/content/download/153100/1551427/file/Fiche_n10_Post_Cold_War_US_Export_Controls_2.pdf.
- Meijer, H. (2013a) 'The Obama Administration's Export Control Reform Effort', *Lettre de l'IRSEM No. 5*, Strategic Research Institute of the French Military Academy. Available at: <http://www.defense.gouv.fr/irsem/publications/lettre-de-l-irsem/les-lettres-de-l-irsem-2012-2013/2012-lettre-de-l-irsem/lettre-de-l-irsem-n-5-2012/dossier-strategique-etat-des-lieux-du-marche-et-de-l-industrie-de-defense-mondiale/the-obama-administration-s-export-control-reform>.
- Meijer, H. (2013b) Trading with the enemy: the making of U.S. export control policy toward the People's Republic of China. PhD dissertation, Paris, Institut d'Etudes Politiques (Sciences Po).
- Meijer, H. (2015) 'Balancing conflicting security interests: US defense exports to China in the last decade of the cold war', *Journal of Cold War Studies*, 17(1), (Winter).
- Milhollin, G. (2000) 'With looser computer controls we're selling our safety short', *Washington Post*.
- Milhollin, G. (2001) 'Fast computers, deadly enemies', *New York Times*.
- Milhollin, G. (2002) Statement in *Export Controls and China*, Hearing before the US-China Economic and Security Review Commission, January 17.
- Mills, C.W. (1956) *The Power Elite*. Oxford: Oxford University Press.
- Morrison, W. (2013) *US-China Trade Issues*. Washington, DC: Congressional Research Service.
- National Research Council. (2009) *Beyond Fortress America: National Security Controls on Science and Technology in a Globalized World*. Washington, DC: The National Academy Press.

- Reinsch, W. (1999) 'Export Controls in the Age of Globalization', *The Monitor: Nonproliferation, Demilitarization and Arms Control*, 5(3), 3–6.
- Rosecrance, R. (1997) 'Economics and national security: the evolutionary process', in R. Shultz, G.H. Quester and R. Godson (eds), *Security Studies for the 21st Century*. London: Brassey's Publishers.
- Ross, R. (1995) *Negotiating Cooperation. The United States and China. 1969–1989*. Stanford: Stanford University Press.
- Segal, A. (2004) 'Practical engagement: drawing a fine line for US-China trade', *The Washington Quarterly*, 27(3), 157–173.
- Suettinger, R. (2003) *Beyond Tiananmen. The Politics of US-China Relations, 1989–2000*. Washington, DC: The Brookings Institution Press.
- Thompson, F. (2001) Statement in *High Performance Computer Export Controls* (Hearing).
- Triplett, W. and Timperlake, E. (1999) *Red Dragon Rising: Communist China's Military Threat to America*. Washington, DC: Regnery Publishing.
- US-China Economic and Security Review Commission (USCC). (2002) *Annual Report to Congress*.
- US-China Economic and Security Review Commission (USCC). (2004) China as an Emerging Regional and Technological Power: Implications for the US (Hearing).
- US Commission on National Security/21st Century. (1999) New world coming: American security in the 21st century. Available at: govinfo.library.unt.edu/nssg/NWR_A.pdf.
- US Congress. (1997) *National Defense Authorization Act for Fiscal Year 1998*, PL 105–85.
- US Congress. (1998) *Chinese Access to Dual-Use and Military Technology* (Hearing).
- US Congress. (2000) *National Defense Authorization Act for Fiscal Year 2001*, PL 106–398.
- US Department of Commerce. (1994a) 'Background Paper for Assistant Secretary Sue Eckert Meeting', *Confidential, National Security Archive*. Collection: China and the US.
- US Department of Commerce. (1994b) 'US-China Export Control Issues', *Classification Unknown, Briefing Paper, National Security Archive*. Collection: China and the US.
- US Department of Commerce. (1996) Annual report to congress, bureau of export administration. Available at: https://bis.doc.gov/index.php/forms-documents/doc_details/930-bis-annual-report-fy-1996?tmpl=component.
- US Department of Commerce. (1999) *Untitled Report on US Export Control Policy toward China*. www.clintonlibrary.gov.

- US Department of Commerce. (2002) *Bureau of Industry and Security Annual Report for Fiscal Year 2002*.
- US Department of Commerce. (2011) *Annual Report of the Bureau of Industry and Security*.
- US Department of Defense. (1999) *Final Report of the Defense Science Board – Task Force on Globalization and Security*. <http://www.acq.osd.mil/dsb/reports/ADA371887.htm>.
- US Department of Defense. (2007) *The Military Power of the People's Republic of China*. <http://www.defense.gov/pubs/pdfs/070523-China-Military-Power-final.pdf>.
- US General Accounting Office. (1998a) *Export Controls: Changes in Controls Applies to the Export of High Performance Computers*.
- US General Accounting Office. (1998b) *Export Controls: National Security Issues and Foreign Availability for High Performance Computer Exports*.
- US General Accounting Office. (1999) *Export Controls: Statutory Reporting Requirements for Computers Not Fully Addressed*.
- US General Accounting Office. (2000) *System for Controlling Exports of High Performance Computing is Ineffective*. December.
- US General Accounting Office. (2002) *Export Controls: More Thorough Analysis Needed to Justify Changes in High Performance Computer Controls*, August, GAO-02-892.
- US General Accounting Office. (2006a) *Offshoring: US Semiconductor and Software Industries Increasingly Produce in China and India*. www.gao.gov/new.items/d06423.pdf.
- US General Accounting Office. (2006b) *President's Justification of the High Performance Computer Control Threshold Does Not Fully Address National Defense Authorization Act of 1998 Requirements*, June 30. www.gao.gov/new.items/d06754r.pdf.
- US House of Representatives. (1996) *Administration China Export Policy Jeopardizes US National Security*. Washington, DC: House National Security Committee, Press Release. <http://www.gpo.gov/fdsys/pkg/CRPT-104hrpt884/html/CRPT-104hrpt884.htm>.
- US House of Representatives. (1997) *Supercomputer Export Control Policy* (Hearing).
- US Senate. (1995) *National Security Implications of Lowered Export Controls on Dual-Use Technologies and Defense Capabilities* (Hearing).
- US Senate. (1997) *Proliferation and US Export Controls, Hearing before the Subcommittee on International Security* (Hearing).
- US Senate. (1998) *GAO Report on High Performance Computers* (Hearing).
- US Senate. (1998a) *US Export Control and Nonproliferation Policy and the Role and Responsibility of the Department of Defense* (Hearing).

- US Senate. (1998b) *Transfer of Satellite Technology to China* (Hearing).
- Walsh, K. (2009) 'The role, promise and challenges of dual-use technologies in national defense', in B. Richard (ed). *The Modern Defense Industry: Political, Economic, and Technological Issues*. Oxford: Praeger.
- Yuan, J.-D. (1996) 'United States technology transfer policy toward China: post-cold war objectives and strategies', *International Journal*, 51(2), 47–79.
- Zhang, S.G. (2001) *Economic Cold War: America's Embargo against China and the Sino-Soviet Alliance, 1949–1963*. Stanford: Stanford University Press.