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COMMENT

LIBERALIZATION OF HIGH PERFORMANCE COMPUTER EXPORT CONTROLS UNDER THE CLINTON ADMINISTRATION: BALANCING NATIONAL SECURITY AND ECONOMIC INTERESTS

Mark D. Gursky

The United States entered the 1990s in the midst of a recession, with an unemployment rate peaking at 7.5% and a Gross Domestic Product (GDP) growth rate of only 3%. Within the past five years, however, the United States has made a dramatic turnaround. The current unemployment rate is 4.1%, GDP growth rate is 5.8%, and the inflation rate is 2.2%. Trading on the New York Stock Exchange (NYSE) and the National Association of Securities Dealers Automated Quotation System (NASDAQ) are at all time highs as investors continue to ride out the surge of the bull market and a stable and growing economy.

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5. See U.S. Bureau of the Census, supra note 1, at 453. The GDP growth rate of 5.8% reflects the GDP growth from 1997 to 1998. See id.


7. See Allan Sloan, Halloween Arrives Early, Newsweek, Oct. 25, 1999, at 34 (noting that the DOW reached an all time high of 11,326 on August 25, 1999). The flurry of trading slowed down, however, and the DOW declined nearly 12% by October, 1999. See id. (commenting on the decline of the Dow Jones Industrial Average to 10,000).

8. See Black's Law Dictionary 982 (7th ed. 1999) (defining a bull market as "[a] securities market characterized by rising prices over a prolonged period").
The high technology industry is a major benefactor and contributor to the United States's current economic success. In 1998, the value of the U.S. high technology industry was $680 billion, or approximately eight percent of U.S. GDP. In the same year, U.S. companies sold $230 billion dollars worth of computers and computer hardware. High technology sales also account for over thirty-five percent of the nation's economic growth between 1995 and 1997.

The economy's strength is largely attributed to a strong foreign demand for U.S.-produced goods. U.S. high technology producers, for example, receive approximately fifty percent of their revenues from exports to foreign markets. The increase in exports translates into more jobs in the United States. Economists estimate that for every one billion dollars of goods exported, 20,000 new jobs are created.

As the United States enters the next millennium, public policy makers are taking steps to ensure that the economy continues to roar into the next century. The recent trend is to remove obstacles from the exportation of goods to foreign markets, especially restraints on commodities

9. See Daley, supra note 3 (reflecting upon the strength of the U.S. economy as the century ends).
11. See id. at 2.
12. See id.
16. See Morillo, supra note 14, at 1113.
17. See id. at 1114 (noting that the Clinton Administration considered this fact in developing a national export strategy) (citing Why Fear Free Trade? Let's Just Sell Our Wares, USA TODAY, Sept. 28, 1993, at 11A).
that have both military and commercial applications, known as dual-use commodities.\textsuperscript{19}

President Clinton’s Administration and Congress are taking affirmative steps toward reforming outdated export control laws that hinder the exportation of goods to foreign markets.\textsuperscript{20} Economists estimate that United States export control laws cost U.S. producers approximately forty billion dollars each year,\textsuperscript{21} resulting in a loss of 200,000 to 400,000 jobs annually.\textsuperscript{22}

The reforming and loosening of export control laws, however, has reignited the debate between national security and business advocates over the appropriate level of restrictions imposed on U.S. exports.\textsuperscript{23} The re-

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\textsuperscript{19} See Morillo, supra note 14, at 1118-19 (discussing the Clinton Administration’s National Export Strategy and its recommendations to remove outdated export controls that impede U.S. economic growth); Export Administration Regulations, 15 C.F.R. § 730.3 (1999) (defining dual-use commodities). The removal of export restraints on dual-use products is particularly important to the computer industry, which has become increasingly export-dependent. See Morillo, supra note 14, at 1115 & n.13 (noting that the computer industry relies on exports to finance research that is vital to economic growth).

\textsuperscript{20} See generally TRADE PROMOTION COORDINATING COMM., U.S. DEPT OF COMMERCE, TOWARD A NATIONAL EXPORT STRATEGY: REPORT TO THE UNITED STATES CONGRESS (1993) (outlining strategies, including legislation, to increase U.S. exports to foreign markets); see also infra notes 125-202 and accompanying text (describing export control reforms under the Clinton Administration).

\textsuperscript{21} See U.S. Export Controls, Other ‘Disincentives’ Cost Firms $40 Billion a Year, Study Says, 10 Int’l Trade Rep. (BNA), No. 38, at 1608 (Sept. 29, 1993) [hereinafter Disincentives] (noting that export controls account for two-thirds to three quarters of export short falls). But see U.S. Export Control and Nonproliferation Policy and the Role and Responsibility of the Department of Defense: Hearing Before the Comm. on Armed Serv., 105th Cong. 29 (1998) (statement of Gary Milhollin, Professor, University of Wisconsin Law School) [hereinafter Milhollin Testimony] (stating that export controls have a miniscule impact on the economy and employment).

\textsuperscript{22} See Morillo, supra note 14, at 1118. But see Jerry J. Jasinowski, Removing U.S. Export Shackles Will Increase Profits and Jobs, CHRISTIAN SCI. MONITOR, July 18, 1994, at 18 (reporting that export control costs U.S. producers only $20 billion and an estimated 380,000 jobs annually).

\textsuperscript{23} See Joseph Ira Burkemper, Note, Export Verboten: Export Controls in the United States and Germany, 67 S. CAL. L. REV. 149, 150 (1993) (noting that there has been a “longstanding tension in export control policy between national security interests—represented mainly by the Defense Department and the defense industry—and economic interests—represented partly by the Commerce Department and industrial lobbyists”); see also Export Administration Act Reauthorization: Hearing Before the Senate Comm. on Banking, Hous. and Urban Affairs, 106th Cong. (1999), available in 1999 WL 20009264, at *1-*2 (statement of Dr. Richard T. Cupitt, Associate Director, Center for International Trade and Security, University of Georgia) [hereinafter Cupitt Testimony] (stating that “[f]inding a prudent balance of the many security, economic, and other interests inherent in nonproliferation export control policy is one of the most difficult tasks facing the U.S. government”).
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cent computer espionage involving the People's Republic of China,24 bombings of U.S. embassies in Africa,25 and the threat of rogue states26 caused public policy makers and others to reevaluate whether the reformation of export control laws went too far in light of such national security threats.27 With the Clinton Administration's July 3, 1999 and February 2, 2000 announcements to further relax export controls on high performance computers, now the question is whether the Administration and Congress caved in to business interests at the cost of national security.28

This Comment reviews the historical evolution, purpose, and scope of export control laws in the United States prior to, and through, the post-Cold War era. This Comment focuses on export control laws affecting high performance computers and the subsequent concerns with exporting these goods to foreign markets. This Comment then details the reformation movement of the 1990s and the latest regulatory changes proposed by the Clinton Administration for high performance computers. Finally, this Comment analyzes the economic and national security implications of these reforms and concludes that the Clinton Administration responded to business concerns without adequately analyzing the national security implications of facilitating the proliferation of high performance computers.

I. THE CONSTANT ATTACK ON EXPORT CONTROL LAWS: FROM STRICT CONTROLS TO GREATER RECOGNITION OF BUSINESS INTERESTS

The United States export control laws constantly undergo changes in order to address the national security, economic, and political climate of the day.29 The current trend moves away from strict controls, as adhered

24. See H.R. REP. NO. 105-851, at ii (1999) (reporting on China's espionage of sophisticated nuclear weapons design information). This report is commonly known as the COX REPORT and will be referred to as such throughout this Comment.
26. For a general discussion of threats posed by rogue states see Lally Weymouth, Good News for Rogue States, WASH. POST, Feb. 4, 1994, at A19 (pointing out that rogue states need computers to develop their nuclear weapons programs).
27. See, e.g., COX REPORT, supra note 24, at 98-150 (rethinking computer export policies in light of the discovery of Chinese espionage of U.S. nuclear weapon secrets).
28. See, e.g., Milhollin Testimony, supra note 21, at 31 (criticizing the Administration for placing business interests ahead of national security interests); see also infra notes 184-202 (discussing the Clinton Administration's revisions of export control laws in the past).
to following the aftermath of World War II, toward a more liberal export control policy, placing economic interests on the same plateau as national security interests.\textsuperscript{30}

\textbf{A. The Early History of Export Controls: The Export Control Act of 1949 and the Establishment of CoCom}

Since the inception of the United States as an independent federal-state, Congress\textsuperscript{31} has restricted goods exported to foreign markets.\textsuperscript{32} Early export control laws applied only during times of war.\textsuperscript{33} But in 1949,\textsuperscript{34} the United States enacted the first comprehensive peacetime\textsuperscript{35} legislation regulating exports.\textsuperscript{36}

\textit{1. The Purpose and Scope of the Export Control Act of 1949}

The Export Control Act of 1949 sought to protect the United States's national security interests, forward its foreign policy agenda, and prevent shortages of critical goods.\textsuperscript{37} Underlying this export control policy was repeated amendments to export control laws and events that sparked such amendments).\textsuperscript{30} See infra Part I.A-E. (discussing the evolution of export control laws from the aftermath of World War II to the present).

31. See U.S. CONST. art. I, § 8, cl. 3 (providing that "Congress shall have [the] [p]ower . . . to regulate Commerce with foreign Nations"). The United States Supreme Court recognized also that the President of the United States holds constitutional power to regulate exports. See United States v. Curtis-Wright Export Corp., 299 U.S. 304, 320 (1936) (stating that the President holds "very delicate, plenary and exclusive power . . . as the sole organ of the federal government in the field of international relations").


33. See Whitney & Perles, supra note 32, at 251 (stating that export "controls were originally imposed at the outset of American participation in World War I to prevent American goods from assisting the nation's enemies during wartime").

34. See L.J. KUTTEN & BRIAN C. MURPHY, AN OVERVIEW OF UNITED STATES EXPORT CONTROL LAWS § 1.03 (1989) (asserting that after World War II the United States "realized that there was a symbiotic relationship between technology and the national defense").

35. See id. (noting that the Export Control Act was the first peacetime export control policy enacted in to law).


37. See Export Control Act § 1 (emphasizing the importance of national security, for-
the desire to scrutinize dual-use exports to the Soviet Union and other Warsaw Pact members, as well as China, and to prevent any adverse impact on the United States's national security interests. Restrictions on high performance computers were critical to accomplishing the United States's national security objectives.

2. Multilateral Control: The Creation of CoCom

The Coordinating Committee on Multilateral Export Controls (CoCom) supplemented the United States domestic export control laws.


40. See id. at 1 (stating that the most important reason for controlling exports was to scrutinize exports to the Soviet Union and other communist countries); see also Phillip H. Oettinger, Comment, National Discretion: Choosing CoCOM's Successor and the New Export Administration Act, 9 AM. U. INT'L L. & POL'Y 559, 566 (1994) (stating that export controls served to restrict the availability of products and technology that could increase the military capabilities of communist countries); Tarlowe, supra note 29, at 959 (noting that during the Cold War the United States sought to restrict exports to the Soviet Union); Reinsch Speech, supra note 15 (positing that the U.S. Cold War export control policy limited goods to the Soviet bloc due to the assumption that the goods would be diverted to military usage).

41. See SEYMOUR GOODMAN ET AL., BUILDING ON THE BASICS: AN EXAMINATION OF HIGH-PERFORMANCE COMPUTING EXPORT CONTROL POLICY IN THE 1990s 1 (1995) (recognizing that for the past fifty years each Congress and Presidential Administration embraced the need to control computer technology for national security purposes); see also GAO, EXPORT CONTROLS: CHANGES IN CONTROLS APPLIED TO THE EXPORT OF HIGH PERFORMANCE COMPUTERS 4 (1998) [hereinafter CHANGES IN CONTROLS] ("The Executive Branch has identified high performance computing as having applications in such national defense areas as nuclear weapons programs, crypotology, conventional weapons, and military operations.") (quoting Harold Johnson, Associate Director, International Relations and Trade Issues, National Security and International Affairs Division).

42. See McKenzie, supra note 39, at 1 (explaining that the United States sponsored the creation of CoCom to promote the policy objectives incorporated in the Export Control Act of 1949). The original members of CoCom were: Australia, Belgium, Canada,
CoCom, an informal non-treaty organization, coordinated export control policies for dual-use commodities to communist bloc countries.\(^\text{43}\) CoCom identified commodities with potential military use, including high performance computers,\(^\text{44}\) and placed these commodities on an “Industrial List.”\(^\text{45}\) After commodity registration and Industrial List compilation, CoCom members incorporated the Industrial List into their own national laws.\(^\text{46}\) This list restricted the export of dual-use commodities by requiring exporters to seek an export license from CoCom prior to exporting the listed commodity.\(^\text{47}\) A single CoCom member could exercise its unilateral veto power to prevent the issuance of a license.\(^\text{48}\)

The United States adopted an aggressive policy of placing commodities on the Industrial List,\(^\text{49}\) causing other member nations to criticize the

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\(^{43}\) See McKenzie, supra note 39, at 1.

\(^{44}\) See Steinbrecher, supra note 38, at 692 (explaining that member nations identified specific computers and telecommunication equipment that required a license from CoCom prior to exporting the listed commodity).


\(^{46}\) See Charles L. Evans, Comment, U.S. Export Control of Encryption Software: Efforts to Protect National Security Threaten the U.S. Software Industry’s Ability to Compete in Foreign Markets, 19 N.C. J. Int’l L. & Com. Reg. 469, 475 (1994). Actions taken by CoCom members were not binding on the member states. See Ihor Fedorowycz, Preventing the Transfer of Militarily Critical Technology to the Soviet Bloc: The Case for Strong National Security Export Controls, 26 Colum. J. Transnat’l L. 53, 73 (1987) (noting that CoCom decisions were not binding on member nations as a matter of international law). Any action taken, including the compilation of the Industrial List, had to incorporate the national laws of each member state. Although CoCom policies were not binding on member states, CoCom successfully prevented the acquisition of computing technology by CoCom’s adversaries. See Goodman et al., supra note 41, at 1-2.

\(^{47}\) See Kutten & Murphy, supra note 34, at § 1.03 (stating that specified commodities could not be exported unless CoCom granted an export license); see also Tarlowe, supra note 29, at 964.

\(^{48}\) See Burkemper, supra note 23, at 159-60 (discussing member state’s unilateral veto power and recommending its elimination).

\(^{49}\) See Peter Swan, A Road Map to Understanding Export Controls: National Security in a Changing Global Environment, 30 Am. Bus. L.J. 607, 620 (1993) (examining the United States’s aggressive policy). The United States’s policy of listing commodities was contrary to its historical free trade philosophy. See id. at 607, 619-20. The policy shift is attributed to the rise of communism in the aftermath of World War II and subsequent Presidential and Congressional efforts to confront this new national security threat. See Trevor Hiestand, Recent Development, Swords into Plowshares: Considerations for 21St
United States for curtailing international trade. These policies sacri-
ficed economic competitiveness for political and security interests. United States politicians and CoCom members criticized the U.S. poli-
cies that influenced Congress to relax export controls. The passage of
the Export Administration Act of 1969 (1969 Act) evidenced these pol-
itical pressures.

B. The Beginnings of Modern Export Control Laws

The 1969 Act reflects Congress's realization that over-aggressive ex-
port control policies impact the economy adversely. Thus, the 1969 Act
limited restraints on exports to only those commodities essential to U.S.
security. Rather than impose an absolute ban on exports to U.S. adver-
saries, Congress permitted the exportation of commodities with no po-
tential military use.

The 1969 Act authorized the President to restrict exports of dual-use

50. See Swan, supra note 49, at 619-620 (discussing the tension among CoCom mem-
bers over the United States's efforts to list dual-use commodities on the Industrial List); see also Oettinger, supra note 40, at 567 (highlighting the controversy over the Industrial List among CoCom members). Representative Thomas L. Ashley noted in 1969 that the United States's efforts to restrict exports to communist nations risked the United States's relations with its allies. See H.R. REP. NO. 524 (1969), reprinted in 1969 U.S.C.C.A.N. 2705, 2709 (emphasizing that the United States's stringent measures risked American political goodwill with its allies).


52. See, e.g., H.R. REP. NO. 524, at 2707-10 (criticizing the United States's export control laws as too restrictive and impeding international trade).


54. See generally H.R. REP. NO. 524, at 2709-10 (emphasizing the need to amend U.S.
export control laws in order to expand international trade).

(4)) (recognizing that the restriction of exports from the United States may adversely af-
fect the economy's welfare); see also Tarlowe, supra note 29, at 965 (stating that "the Ex-
port Administration Act of 1969 recognized that overbroad export controls impair the in-
terest of U.S. business to export their goods").

56. Export Administration Act of 1969 § 3(1)(B) (codified today at 50 U.S.C. §
2402(2)(A)) (establishing a policy to restrict exports only if the goods or technology con-
tribute to the military capabilities of another country or prove detrimental to U.S. national
security interests).

57. See KUTTEN & MURPHY, supra note 34, at § 1.03 (explaining the liberalization of
U.S. policies with respect to exports to communist bloc countries).
commodities only after the President considered several factors. These factors included the status of the relationship between a foreign country and the United States and its allies, foreign availability of the commodity, and the potential for the United States to enter into foreign negotiations to cease the exportation of the commodity.

As a supplement to the 1969 Act, Congress passed the Equal Export Opportunity Act (EEOA) in 1972. The EEOA permitted the exporta-

58. See Swan, supra note 49, at 618 (discussing the factors to be reviewed prior to restricting exports to a specified destination).

59. See Export Administration Act of 1969 § 3(1) (codified today at 50 U.S.C. app. § 2404(b)(1) (1994)) (providing a list of factors the President should take in account to determine whether to institute trade controls against a country).

60. See id. § 3(3) (codified today at 50 U.S.C. app. § 2404(f)). A foreign availability analysis is not necessary to eliminate or relax export restraints. See CHANGES IN CONTROLS, supra note 41. A foreign availability analysis is only required when the commodity is subject first to export control. See Export Administration Act of 1979, Pub. L. No. 96-72, § 5(f), 93 Stat. 503, 506-13 (1979) (codified as amended at 50 U.S.C. app. § 2404(f)(1). The Secretary of Commerce conducts the foreign availability analysis in consultation with the Secretary of Defense and other government agencies, to determine whether goods or technology are available to controlled countries from non-U.S. suppliers in sufficient quantity and of comparable quality so that the requirement of a validated license is ineffective in achieving U.S. national security objectives. See id.; see also Export Administration Regulations, 15 C.F.R. § 768.1 (defining comparable quality goods as those that have the following similar characteristics: “(1) function; (2) technological approach; (3) performance thresholds, (4) maintainability and service life; and (5) any other attribute relevant to the purpose for which the control was placed on the item”). If the Secretary of Commerce determines that goods and technology are available to controlled countries, the Secretary cannot require a validated license, unless the finds that the absence of controls on such goods are detrimental to U.S. national security interests. See 50 U.S.C. app. § 2404(f)(4)(1).

61. See Export Administration Act of 1969 § 3(3) (codified today at 50 U.S.C. app. § 2404(i), (k)) (directing the President and Secretary of State respectively to enter negotiations with foreign countries to restrict exports to controlled countries in order to carry out U.S. policy objectives).

62. Equal Export Opportunity Act, Pub. L. No. 92-412, 86 Stat. 644 (1972) (codified at 50 U.S.C. app. § 2401). Congress enacted the Equal Export Opportunity Act in response to concerns that U.S. export control laws hindered U.S. companies from competing with foreign producers. See S. REP. No. 92-890 (1972), reprinted in 1972 U.S.C.C.A.N. 3085, 3086 (stating that the “United States is handicapping itself by continuing to control the export of many items which are not of strategic value and are not controlled by our by foreign competitors”). The EEOA’s purpose was quick removal of unilateral export controls that provided no protection to U.S. national security interests. See id. at 3085. The EEOA proposed to utilize the commercial and technical expertise of private industry to administer export control laws and regulations. See id. at 3086. Several industry witnesses testified during committee hearings that U.S. licensing procedures took longer and were more extensive than those required abroad. See id. at 3087-88 (noting industry’s criticisms of licensing delays, excessive documentation, limited predictability of license approval, minimal license exceptions, and reporting requirements relating to diversions of technology to unauthorized end-users). But see S. REP. NO. 92-890, at 3088 (stating that the congressional committee refused to take a position on the industry’s allegations). Although
tion of commodities freely available from Western European or Japanese competitors. The EEOA relaxed restrictions on exports in order to prevent U.S. industries from losing business to its competitors.

1. Modern Export Control Laws: The 1979 Act and Amendments

Faced with the expiration of the 1969 Act, Congress promulgated an entirely new act known as the Export Administration Act of 1979 (1979 Act). The 1979 Act is the foundation of current export controls on dual-use commodities. It establishes a control system to manage the risks of exporting military-sensitive technology to U.S. adversaries.

The 1979 Act maintains three policy objectives articulated by the Export Control Act of 1949: (1) to protect national security, (2) to promote the United States's foreign policy agenda, and (3) to prevent the short supply of critical goods. In order to implement these objectives, Congress delegated to the President broad authority to curtail the expor-

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63. See KUTTEN & MURPHY, supra note 34, at § 1.03 (explaining Congress's realization that export controls did not effectively control goods that non-CoCom members produced and made available); see also 50 U.S.C. app. § 2404(f)(1) (describing the current foreign availability provisions of the 1979 Act).

64. See S. REP. No. 92-890, at 3086-87 (discussing the negative implications of overly restrictive export controls and the willingness to relax such controls to place U.S. producers "on an equal footing with foreign competitors").


66. See Tarlowe, supra note 29, at 966 (stating that 1979 Act replaced the 1969 Act as the "primary export control legislation").

67. See CHANGES IN CONTROLS, supra note 41, at 1 (characterizing the current export control system as a risk management system).

68. 50 U.S.C. app. § 2402(2)(A) (authorizing export controls that are "necessary . . . to restrict the export of goods and technology which would make a significant contribution to the military potential of any other country or combination of countries which would prove detrimental to the national security of the United States"); see also id. § 2404 (delineating the statutory provisions for national security controls).

69. Id. § 2402(2)(B) (providing that export controls may be used "to restrict the export of goods and technology where necessary to further significantly the foreign policy of the United States or to fulfill its declared international obligations"); see also id. § 2405 (delineating the statutory provisions for foreign policy controls).

70. Id. § 2402(2)(C) (noting that export controls may be used "to restrict the export of goods where necessary to protect the domestic economy from the excessive drain of scarce materials and to reduce the serious inflationary impact of foreign demand"); see also id. § 2406 (delineating the statutory provisions for short supply controls).
ration of goods and high-technology equipment.\textsuperscript{71} The President, however, rarely exercises the authority to restrict exports.\textsuperscript{72} Instead, the Commerce Department's Bureau of Export Administration implements these policy objectives through the Export Administration Regulations (EAR),\textsuperscript{73} an extensive and complex licensing system for exports.\textsuperscript{74}

The Commerce Control List (CCL) is the central component of the EAR.\textsuperscript{75} The CCL is a comprehensive list "of all of the commodities, software and technical data that are subject to export controls."\textsuperscript{76} The CCL delineates dual-use commodities subject to control,\textsuperscript{77} the reason for control,\textsuperscript{78} and the countries in which the exportation of the commodity is prohibited or limited.\textsuperscript{79} The greatest share of goods regulated by the EAR comprise of manufactured goods, including computers, telecommunications equipment, and related technology.\textsuperscript{80}

\textsuperscript{71} See id. § 2404 (a)(1) (stating that "the President may, in accordance with the provisions of this section, prohibit or curtail the export of any goods or technology subject to the jurisdiction of the United States or exported by any person subject to the jurisdiction of the United States").

\textsuperscript{72} See Oettinger, supra note 40, at 569 (pointing out that the President rarely exercises this authority because the President historically has delegated this authority to the Secretary of Commerce).


\textsuperscript{74} Id. § 730.2 (providing that the EAR is designed primarily to implement the Export Administration Act of 1979). The EAR provides detailed instructions for exporters to determine their regulatory obligations. See 15 C.F.R. § 732 (providing over ten pages of instructions and flow charts to assist exporters in deciphering the 550 pages of regulations and supplementary information under the EAR).

\textsuperscript{75} The Commerce Control List, 15 C.F.R. § 774.1 (1999) (providing an extensive list of commodities subject to export control); see also Swan, supra note 49, at 625 (stating "[t]he heart of the control scheme is the Commodity Control List").

\textsuperscript{76} McKenzie, supra note 39, at 3.

\textsuperscript{77} See 15 C.F.R. pt. 774, Supp. 1 (1999) (separating the dual-use commodities into ten separate categories, including, (1) nuclear materials, facilities and equipment, and miscellaneous, (2) materials processing, (3) materials, chemicals, microorganisms, and toxins, (4) electronics, (5) computers, (6) telecommunications and information security, (7) lasers and sensors, (8) navigation and avionics, (9) marine, and (10) propulsion systems, space vehicles, and related equipment).

\textsuperscript{78} See id. § 738.2 (providing the following possible reasons for control: (1) antiterrorism, (2) chemical & biological weapons, (3) crime control, (4) encryption items, (5) missile technology, (6) national security, (7) nuclear nonproliferation, (8) regional stability (9) short supply, (10) computers, and (11) other significant items). Most dual-use commodities are subject to control for national security or foreign policy reasons rather than for short supply reasons. See Steinbrecher, supra note 36, at 682 (noting that most manufactured goods, including computers, are controlled more likely for foreign policy and national security rather than short supply reasons).

\textsuperscript{79} See 15 C.F.R. pt. 738, Supp. 1 (providing a comprehensive list of countries subject to control and the reasons for controls).

\textsuperscript{80} See Excerpts from Clinton Administration's Report, "Toward a National Export
According to the 1979 Act, a U.S. producer who wishes to export a listed item must first obtain a license from the Department of Commerce. There are currently three types of licenses: (1) validated licenses, (2) validated licenses authorizing multiple exports, and (3) general licenses.

Through the mid-1980s, export control laws placed restrictions on the exportation of nearly all computer systems to communist bloc countries. The Department of Commerce required exporters to obtain explicit approval prior to exporting computer systems to controlled countries. U.S. producers subsequently complained of lost business opportunities to foreign competitors due to the length and extensive reporting requirements of the licensing process.

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83. See 50 U.S.C. app. § 2403(a)(1) (authorizing the Secretary of Commerce to issue a validated license). A validated license authorizes a specific export for which an exporter applied. See id.

84. See id. § 2403(a)(2) (providing for validated licenses that authorize multiple exports, including a distribution license and a comprehensive operations license). The Exportation Administration Amendments Act of 1985 added the validated license that authorized multiple exports in order to streamline the licensing process for applicants wishing to export multiple goods. Export Administration Amendments Act of 1985, Pub. L. 99-64, § 104(a), 99 Stat. 120, 122-23 (1985).

85. See 50 U.S.C. app. § 2403(a)(3) (authorizing the issuance of a general license). A general license authorizes an applicant to export commodities without submitting an application to the Department of Commerce's Bureau of Export Administration. See id.

86. See, e.g., id. § 2401(11) (recognizing that the acquisition of national security sensitive goods by the Soviet Union and other countries poses a threat to the United States); see also GOODMAN ET AL., supra note 41, at 1.

87. See GOODMAN ET AL., supra note 41, at 1.

88. See, e.g., S. REP. NO. 92-890 (1972), reprinted in 1972 U.S.C.C.A.N. 3085, 3086-88 (discussing the complaints over U.S. export controls and the licensing process); see also Hiestand, supra note 49, at 693 (discussing the economic impact of U.S. licensing requirements on producers).
2. The 1980s: Correcting the Deficiencies in the 1979 Act and Engaging Japan to Control Supercomputers

In the 1980s, the Executive Branch and Congress fine-tuned the 1979 Act through subsequent legislation. In addition, the United States and Japan signed an agreement known as the Supercomputer Control Regime to supplement existing multilateral and national export controls on high performance computers.

a. Legislative Attempts to Balance Export Controls

The Export Administration Amendments Act of 1985 (1985 Act) and the Omnibus Trade and Competitiveness Act of 1988 (OTCA) addressed several deficiencies contained in the 1979 Act. The 1985 Act addressed the unnecessary regulation of dual-use exports to Western European countries, foreign availability exceptions, and the establishment of objective criteria to determine whether a country should be “controlled.”

89. See infra, notes 91-92 and accompanying text (providing the legislation enacted to correct the deficiencies of the 1979 Act).
90. See infra, notes 109-110 and accompanying text (discussing the creation and function of the Supercomputer Control Regime).
93. See infra notes 94-99, 103-108 and accompanying text (discussing the provisions of the 1985 Act and the OTCA).
94. See Hiestand, supra note 49, at 696. The 1985 Act eliminated these controls with regard to friendly countries. See id. (stating that Congress enacted the 1985 Act to rectify the inefficient licensing system for exports to “these friendly countries”).
95. See Export Administration Act of 1979, 50 U.S.C. app. § 2404(f)(1)-(10) (1994) (providing the definition of foreign availability and delineating the process for determining the availability of a commodity). The 1985 Act placed greater emphasis on placing export controls on only those commodities that the Department of Commerce controlled. See Hiestand, supra note 49, at 696 (explaining that controls on U.S. commodities had little effect in securing national security interests when foreign suppliers made such commodities available to controlled countries). The 1985 Act required the Secretary of Commerce to eliminate licensing requirements for commodities available from international sources other than the United States. See id. (stating that the 1985 amendments required the Secretary of Commerce to suspend licensing requirements for the controlled commodity).
96. 50 U.S.C. app. § 2404(b)(1) (requiring the President to consider six factors to determine whether to add a country to the control list). “Essentially, these criteria required the President to demonstrate that the acquisition by the controlled country of regulated technologies would be directly, not merely incidentally, ‘detrimental’ to national security.”
In addition, the 1985 Act made a distinction between two types of
computers: low-end systems, such as personal computers (PCs), and
high-end systems. The technological advancements in the computer
industry increased the composite theoretical performance level of low-end
systems. The technological advancements sparked a surge in consumer
demand; in turn, the advancements resulted in the global proliferation of
low-end computer systems. The proliferation of low-end computer systems aggravated U.S. export
controls on computers because U.S. adversaries could readily obtain
computer technology from non-U.S. suppliers. This reality led the De-
partment of Commerce to decontrol the first wave of PCs in January,

The OTCA aided the Department of Commerce’s efforts to decontrol
PCs by establishing a supercomputer definition that distinguished

Hiestand, supra note 49, at 696.

97. See GOODMAN ET AL., supra note 41, at 1-2 (explaining that the PC industry’s
success required the Department of Commerce to distinguish between high-end and low-
end systems because the Department of Commerce could no longer control the prolifera-
tion of all PC technology).
98. See id.
99. See id. at 1.
100. See id. at 2 (discussing the impact of global computer manufacturing on the effect-
iveness of U.S. export control laws).
101. See Foreign Availability Determinations Procedures and Criteria, 15 C.F.R. §
768.1 (1999) (defining decontrol as the removal of license requirements under the Export
Administration Regulations).
102. See GOODMAN ET AL., supra note 41, at 2 (explaining that, because the Depart-
ment of Commerce could no longer effectively control the proliferation of PC technology,
U.S. producers could freely, and without a license, export the first wave of PCs).
103. See Hiestand, supra note 49, at 698 (noting that the OTCA broadened the num-number of countries that would be exempt from the EAR’s validated licensing requirements).
Also, the OTCA addressed issues involving export controls, including relaxing the re-
quirement for obtaining an export control license for a shipment to CoCom countries and
others, clarifying the timelines and procedures for determining foreign availability, reduc-
ing the number of commodities on the CCL, and establishing limitations on the exporta-
tion of component parts of final products. See generally Swan, supra note 49, at 624-25.
a supercomputer as “advanced architecture, very high speed, computer systems that can
solve highly complex problems in strategically relevant time frames”). The high process-
ing capabilities of supercomputers have unique military applications. See id. The United
States and its Western European allies had a strategic military advantage over the Soviet
Union and its allies because the United States and Western European countries domi-
nated supercomputer technology. See id. The regulatory amendments sought to prevent
the erosion of this strategic advantage by subjecting supercomputer exports to the De-
partment of Commerce’s review and approval. See id. (stating that the diversion of
supercomputer technology to the Soviet Union could jeopardize U.S. national security).
The original definition in the OTCA "established a threshold performance level above which a computer would be considered a supercomputer for export control purposes." Congress set the initial supercomputer definition at 160 million floating point operations per second (MFLOPS). This definition was subject to annual review.

b. The Two Giant Supercomputer-Producing Countries Reach an Agreement: The Supercomputer Control Regime

Beyond legislative efforts to improve export controls, the United States and Japan reached an agreement in 1984 to coordinate export controls for a specific list of the ten highest performing computers. The accord is known as the Supercomputer Control Regime. Japanese and U.S. government officials worked informally with computer producers to impose a supercomputer definition and measures to safeguard national security interests. This bilateral agreement was generally successful in establishing uniform export controls and preventing the proliferation of high performance computers to countries of national security concern. U.S. producers criticized the agreement, however, because it resulted in increased export controls on computers and allegedly failed to hold Japanese producers to similar controls imposed in the United States.


106. GOODMAN ET AL., supra note 41, at 2.

107. See id. at 2 & n.7 (defining MFLOPS as the rate of speed that a computer can perform complex scientific calculations based upon floating-point arithmetic). In June, 1990, CoCom adopted a new standard for evaluating computer performance. See id. at 3 & n.13. The new standard is called Composite Theoretical Performance (CTP) and is measured in millions of theoretical operations per second (MTOPS). See id. at 3. MTOPS, like MFLOPS, "indicate[] greater raw performance of a computer to solve scientific computations quickly, but not the actual performance of a given machine for a given application." GAO, EXPORT CONTROLS: INFORMATION ON THE DECISION TO REVISE HIGH PERFORMANCE COMPUTER CONTROLS 2 n.4 (1998) [hereinafter THE DECISION].

108. See GOODMAN ET AL., supra note 41, at 2 (stating that the government reviewed the level of MFLOPS on an annual basis).

109. See id. at 2 (discussing the creation of the Supercomputer Control Regime).


111. See GOODMAN ET AL., supra note 41, at 2 (explaining that the U.S. computer industry criticized the informality of the accord).

112. See id.

113. See id.
C. A Change in Times: The End of the Cold War Sparks New Export Control Laws

Although the 1985 and 1988 Acts liberalized U.S. export controls on high technology goods, the United States maintained the most extensive and stringent export control regime in comparison to its trading partners.114 With the collapse of the Soviet Union and communist regimes in Eastern Europe, however, business interests lobbied Congress and the Department of Commerce to relax export controls further.115

In 1990, in response to the changing political and economic environment, CoCom took the first step toward changing export policies.116 Member nations sought to reduce the number of goods subject to export restraints.117 In June 1990, CoCom members reached an agreement to relax controls on telecommunications, computers, and machine tools that were exported to the Soviet Union and Eastern European countries.118 In addition, CoCom agreed to revamp completely the Industrial List.119 In May 1991, CoCom members agreed upon a "Core List" of commodities, software and technical data that [remained] subject to export controls.120 The Department of Commerce amended the EAR in August 1991 to incorporate the Core List.121 These changes benefited exporters by removing national security controls on commodities that previously required a validated license before exporting the commodity.122

114. See Hiestand, supra note 49, at 699 (highlighting that the United States imposed more restrictions despite export control liberalization in the 1980s).
115. See Tarlowe, supra note 29, at 960-61 (noting that the computer industry criticized controls on dual-exports following the fall of the Soviet Union).
116. See McKenzie, supra note 39, at 2 (explaining that the fall of communism in Eastern Europe, the break up of the Warsaw Pact, and the deterioration of the Soviet military caused CoCom to reexamine its export control policies).
117. See id.
118. See id. (noting that the United States adopted the relaxed export controls in 1990).
119. See id. (commenting that the negotiations sought to limit export controls to goods capable of benefiting the production of military applications).
122. See id. at 42,824.
D. High Performance Computer Export Reforms Under the Clinton Administration

1. The National Export Strategy and 1993 Amendments

On the heels of CoCom's recognition that technological advancements necessitated a dynamic export control system, the Clinton Administration revised export control laws to reflect the realities of technological innovations and a changed political environment. In September 1993, the Clinton Administration and members of the Trade Promotion Coordinating Committee (TPCC) unveiled the "National Export Strategy" (NES). This report outlined a long-term strategic policy to increase U.S. exports abroad through the implementation of over sixty recommendations.

The TPCC recognized the excessiveness of computer and telecommunications export controls. The high technology industry claimed that export controls cost the industry millions of dollars in potential revenue. Consequently, the TPCC advocated relaxing computer and telecommunications equipment export controls and increasing computer

123. See President's Remarks Announcing a National Export Strategy and an Exchange with Reporters, 29 WEEKLY COMP. PRES. DOC. 1918, 1919 (Sept. 29, 1993) (stating that export control laws "no longer reflect the realities of the economic marketplace," political environment, or recent technological innovations).


125. TRADE PROMOTION COORDINATING COMM., U.S. DEP'T OF COMMERCE, TOWARD A NATIONAL EXPORT STRATEGY: REPORT TO THE UNITED STATES CONGRESS (1993); Morillo, supra note 14, at 1113. The NES is an outgrowth of the 1992 Act, which established TPCC, a group of nineteen government agencies involved in export regulation. See Export Enhancement Act of 1992 §§ 2312(a), (d) (establishing, and providing the members of the TPCC). The 1992 Act charged the TPPC with developing a singular framework to coordinate export promotion and financing, and to establish a strategic plan to carry out federal export promotion and financing programs. See id. § 2312(b)(1)-(2); see also S. REP. NO. 102-320, at 14 (1992), reprinted in 1992 U.S.C.C.A.N. 1548, 1564 (commenting on the necessity of a singular national export strategy given the disjointed approach to promoting exports by federal agencies).

126. See Excerpts, supra note 80, at 1659.

127. In 1993 over eighty percent of export control licenses were sought for computers, telecommunications equipment, and electronics equipment. See TPCC Export Plan, supra note 80, at 1645; see also Kenneth Flamm, Controlling the Uncontrollable, BROOKINGS REV., Winter 1996, at 22 (pointing out that PCs fell under the definition of a supercomputer because export laws failed to keep pace with technological innovations).

128. See, e.g., Eagleburger Says Allied Pressure Will Force End to CoCom Relatively Soon, 10 INT'L TRADE REP. (BNA), No. 38, at 1609-10 (Sept. 29, 1993) (quoting Robert E. Allen, Chairman, AT&T, as stating that then-current restrictions on high technology exports, if continued, could threaten approximately $500 million in potential sales to foreign markets over five years).
Theoretical performance levels.\textsuperscript{129} The implementation of the TPCC's recommendations removed licensing requirements on over $30 billion worth of computers and high technology equipment.\textsuperscript{130} The removal of licensing requirements also meant that U.S. industries could export to previously restricted foreign markets.\textsuperscript{131}

The NES report recommended increasing the general license eligibility level for digital computers from 12.5 MTOPS to 500 MTOPS for most countries.\textsuperscript{132} By February 1994, the Administration amended the EAR to implement this recommendation.\textsuperscript{133} The amendments also extended the availability of general licenses for computers with a CTP level of 1000 MTOPS or less to exports sent to most Western European countries.\textsuperscript{134} In practice, this meant that exporters would not experience the delays and reporting requirements characteristic of applying for a validated license.\textsuperscript{135} The exportation of computers with more than 1000 MTOPS, however, required a validated license.\textsuperscript{136}

In addition, the NES recommended a change in the definition of a supercomputer by increasing the CTP level from 195 MTOPS to 2000 MTOPS.\textsuperscript{137} Upon the unanimous recommendation of the Departments

\begin{itemize}
\item \textsuperscript{129}See Excerpts, \textit{supra} note 80, at 1652 (listing recommendations fifty-two through fifty-four of the NES report, which advocated increasing MTOP levels for both supercomputers and low end computers).
\item \textsuperscript{130}See \textit{id}. at 1648.
\item \textsuperscript{131}See Morillo, \textit{supra} note 14, at 1120 (explaining that the computer and telecommunication industries were pleased by the NES recommendations because of the potential for increased profits in markets previously restricted by export control laws); see also Steinbrecher, \textit{supra} note 38, at 691 (affirming that the export plan permitted U.S. producers to export supercomputers to previously restricted countries).
\item \textsuperscript{132}See Excerpts, \textit{supra} note 80, at 1645.
\item \textsuperscript{133}See Computers: General License Eligibility; Supercomputer Definition, 59 Fed. Reg. 8848, 8848 (1994) (original amendments codified at 15 C.F.R. pts. 770, 772, 773, 776, and 799) (increasing the general license availability to cover computers with a CTP of 500 MTOPS or less for countries on the "Nuclear Nonproliferation Special Country List"). The regulatory amendments did not permit a general license for exports to Iran, Syria, the People's Republic of China, or the South African military or police. \textit{See id}.
\item \textsuperscript{134}See \textit{id}. (explaining the eligibility requirements for exporting computers with a CTP level greater than 1000 MTOPS).
\item \textsuperscript{135}Cf. S. REP. NO. 92-890 (1972), \textit{reprinted} in 1972 U.S.C.C.A.N. 3085, 3086-087 (discussing the industry's criticism of licensing delays and reporting requirements).
\item \textsuperscript{136}See Computers: General License Eligibility; Supercomputer Definition, 59 Fed. Reg. at 8848.
\item \textsuperscript{137}See GOODMAN ET AL., \textit{supra} note 41, at 3-4 (explaining that the NES report recommended that the United States begin negotiations with Japan to increase the CTP levels); see also \textit{National Defense Authorization Act for Fiscal Year 1998—H.R. 1119 and Oversight of Previously Authorized Programs: Hearings Before the House Comm. on Nat'l Sec.}, 105th Cong. 908 (1997) (statement of William A. Reinsch, Under Secretary for Export Administration, Department of Commerce) [hereinafter Reinsch Testimony] (stating
\end{itemize}
of Defense, State, Commerce, and Energy, and the Arms Control Disarmament Agency, in 1994 the Bureau of Export Administration altered the definition of a supercomputer in the EAR by increasing the CTP level to 1500 MTOPS.\footnote{138}{See Computers: General License Eligibility; Supercomputer Definition, 59 Fed. Reg. at 8848 (explaining the new definition of a supercomputer and the changes to licensing requirements); see also Flamm, supra note 127, at 24 (noting that the United States was unsuccessful in persuading Japan, the only other country manufacturing high performance computers at that time, to increase the threshold performance level to 2000 MTOPS).}

2. Applying the National Export Strategy Internationally: Dissolution of CoCom and the Creation of Wassenaar

To supplement the liberalization of national export control laws, in November 1993 the Clinton Administration proposed to dissolve CoCom and create a successor multilateral export control regime more oriented with the post Cold-War environment.\footnote{139}{See COX REPORT, supra note 24, at 13-15 (discussing the formation of Wassenaar); see also infra note 239 and accompanying text (discussing former Secretary of Defense William Perry’s role in dissolving CoCom). The objectives of the new multilateral organization included: [1.] Preventing states such as Iraq, Iran, North Korea, and Libya from obtaining conventional weapons and other sensitive technologies[;] [2.] Furthering the process of engaging Russia and other Newly Independent States in developing export control systems[;][and] [3.] Removing disadvantages to U.S. exporters resulting from inadequate multilateral coordination on exports of sensitive technologies to terrorist states. COX REPORT, supra note 24, at 14 (footnote omitted).} After March 31, 1994, CoCom ceased to exist.\footnote{140}{See COX REPORT, supra note 24, at 14. CoCom members agreed to utilize the CoCom export control lists until a successor organization was formed. See id.}

Two years later, twenty-eight countries\footnote{141}{See U.S. Department of Commerce, Bureau of Export Administration, Wassenaar Members and Criteria (visited Feb. 19, 2000) <http://www.bxa.doc.gov/Wassenaar/Members&Criteria.htm> [hereinafter Wassenaar Members]. Current Wassenaar membership consists of the following thirty-three countries: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Republic of Hungary, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovak Republic, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, and the United States. See id.} reached an agreement to create the “Wassenaar Arrangement on Export Control for Conventional Arms and Dual-Use Goods and Technologies” (Wassenaar Arrangement or Wassenaar).\footnote{142}{See OSCE, Wassenaar Arrangement Office, Brief History of the Wassenaar Arrangement (visited Feb. 19, 2000) <http://www.osce.usia.co.at/wassenaar/wahist.htm>
countries are no longer required to submit export licenses for military sensitive commodities and technologies for review by other countries. Critics argue that the discretionary implementation of Wassenaar policies removes the "teeth" that CoCom exemplified in controlling dual-use exports.

3. Trying to Keep up With Technology and Changing National Security Threats: The 1996 Amendments

In 1995, the Clinton Administration struggled to keep pace with the relentless technological revolution. Based on a 1995 Stanford Institute report, the Clinton Administration announced major reforms to export controls on high performance computers on October 6, 1995. The re-

(providing a brief history of the creation of Wassenaar). Twenty-eight countries formally agreed to establish Wassenaar in December 1995. See id. The agreement did not become effective until thirty-three co-founding members approved the initial elements of the Wassenaar Arrangement. See id. Wassenaar's purpose is "to promote international and regional peace and security by promoting transparency, and responsibility and, when appropriate, restraint in transfers of conventional arms and dual-use goods and technologies." Id.

143. See COX REPORT, supra note 24, at 15 (explaining the differences between CoCom's and Wassenaar's export license review process).

144. See id. (stating that member countries share a common control list, but decide independently how to implement the control list and its objectives).

145. Peter H. Stone, High-Tech's High Anxiety, 30 NAT'L J. 2926, 2931 (1998). One Pentagon critic claims that Wassenaar "doesn't control anything. It's basically a reporting regime." Id.

146. See Flamm, supra note 127, at 22 (stating that the government could not effectively control the export of computer technology due to advancements in the computer industry); see also GOODMAN ET AL., supra note 41, at 1 (recognizing that "[a]dapting export control policy to accommodate rapid changes in the designs, development, distribution, and use of technology is necessarily an ongoing and difficult process"). The computer industry's success in developing cutting edge technology is highlighted by the advancements in microprocessor chips. See Flamm, supra note 127, at 23 (noting that technological advancements increase the capacity of microprocessor chips every five years).

147. See THE DECISION, supra note 107, at 4 (noting that the Stanford University study influenced the executive branch to review high performance computer export controls). But see Letter from David Tarbell, Director of Defense Technology Security Administration, to Benjamin D. Nelson, Director, International Relations and Trade Issues, National Security and International Affairs Division, U.S. General Accounting Office 44, 45 (July 16, 1998) [hereinafter Tarbell Letter], reprinted in THE DECISION, supra 108, at 44 (stating that the Stanford University study was just one of many inputs the Executive Branch considered in assessing computer export controls).

forms were two-fold. First, the Clinton Administration proposed to increase CTP levels with respect to licensing requirements. Second, the Clinton Administration planned to create a license exception for computer exports based upon a four-tiered country-licensing system. These reforms sought to protect allied security interests and to eliminate unnecessary or ineffective export controls. In addition, a four-tiered licensing system permits the government to customize licensing requirements and control levels consistent with the national security and proliferation risk posed at a specific destination.

4. The Computer Tier Country System and Increased MTOP Levels

The Administration amended the EAR by establishing a four-tiered licensing system to distinguish between countries that posed varying de-
degrees of risk to U.S. national security. Exporters were required to meet different licensing requirements depending upon the country and its status within one of four computer tiers. Exports to Computer Tier 1 countries, for example, do not require a license issued by the Department of Commerce before exporting high performance computers because these countries are U.S. allies and do not threaten U.S. national security interests. Computer Tier 2 countries consist of countries that pose minimal national security threats to the United States. Exporters are permitted to export high performance computers up to 10,000 MTOPS under a license exception, but a validated license is required above that level. Computer Tier 3 countries either pose nonproliferation or security concerns or are not signatories to the Nuclear NonProliferation Treaty. Export licenses are required for computers over 7000 MTOPS for all end-users and end-uses, and over 2000 MTOPS for military or proliferation-related end-users and end-uses.

Computer Tier 4 countries are considered “embargoed” countries due

154. See Revisions to the Export Administration Regulations: License Exceptions, 61 Fed. Reg. 64,272 (1996) (codified at 15 C.F.R. pts. 732, 736, 740, 742, 744, 746, 750, 752, 758, and 770) (amending the EAR by reorganizing the license exceptions referenced by the Commerce Control List). The Clinton Administration assigned countries to one of the four Computer Tiers by assessing the countries on the basis of the following six criteria: (1) [E]vidence of on-going programs of national security concern, including proliferation of weapons of mass destruction with associated delivery systems and regional stability and conventional threats; (2) membership in or adherence to non-proliferation and export control regimes; (3) an effective export control system, including enforcement and compliance programs and an associated assessment of diversion risks; (4) overall relations with the United States; (5) whether U.N. sanctions had been imposed; and (6) prior licensing history.

THE DECISION, supra note 107, at 7.

155. See Revisions to the Export Administration Regulations: License Exceptions, 61 Fed. Reg. at 64,276-77 (providing the requirements of each of the four Computer Tiers).

156. See NATIONAL SECURITY ISSUES, supra note 110, at 2.

157. See THE DECISION, supra note 107, at 3 (listing computer Computer Tier 1 countries as primarily U.S. allies, including Western European countries and Japan).

158. See id.

159. See Export Administration Regulations, 15 C.F.R. § 740.7(c)(2) (1999) (permitting U.S. producers to export computers to Computer Tier 3 countries under a license exception); see also id. § 740.7(a) (defining the scope of a license exception and discussing the requirements for granting a license exception).

160. See NATIONAL SECURITY ISSUES, supra note 110, at 2 (distinguishing the characteristics of each of the four tiers).

161. See id.; see also 15 C.F.R. § 744 (defining end-users and end-uses). In order to determine end-users and end-uses, exporters are required to conduct an end-use screening process. See THE DECISION, supra note 107, at 3 n.6 (describing the end-use screening process as a mechanism for exporters “to evaluate whether a transaction involves an unacceptable risk of use in, or diversion to, a proliferator or military end user”).
to their support of international terrorism.\textsuperscript{162} Exporters are permitted to export only computers at a mere 6 MTOP level.\textsuperscript{163} Thus, exportation of computers to Tier 4 countries is virtually prohibited.\textsuperscript{164}

In order to ward off criticism from national security advocates over the liberalization of export controls, President Clinton issued an Executive Order that permitted the Departments of State, Defense, and Energy, and the Arms Control and Disarmament Agency to review any export license application submitted to the Department of Commerce pursuant to the 1979 Act and the EAR.\textsuperscript{165} The Executive Order subjected export controls to additional scrutiny by agencies more concerned with national security.\textsuperscript{166}

Industry leaders predicted that the 1995 reforms would free more than $10 billion worth of computer exports from the need to obtain individual licenses.\textsuperscript{167} The regulations relieved U.S. computer manufacturers from the burden of individual licensing requirements that often hindered U.S. producers from competing with foreign producers.\textsuperscript{168} Due to these reforms, the number of issued export licenses decreased from 395 in 1995 to 42 in 1997.\textsuperscript{169}

\textbf{5. Two Steps Forward One Step Back: Congress Limits Presidential Authority}

The 1996 reforms came under attack in 1997 when International Business Machines (IBM) and Silicon Graphics, Inc. (SGI) allegedly exported high performance computers to Russian nuclear weapons laboratories in violation of export control laws.\textsuperscript{170} According to then Russian

\begin{footnotesize}
\begin{enumerate}
\item[162.] 15 C.F.R. § 740.7(e) (prohibiting the use of a license exception for exports to Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria); see id. § 742.1(d) (identifying Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria as countries that support international terrorism).
\item[163.] See generally Reinsch Testimony, supra note 137, at 911.
\item[164.] See NATIONAL SECURITY ISSUES, supra note 110, at 2.
\item[166.] Id.
\item[167.] See Department of Commerce: Commerce Department Implements Regulations Liberalizing Controls on Computers (Jan. 25, 1996) (Press Release, on file with Catholic University Law Review) (commenting on the Clinton Administration’s announcement of reforming export controls on higher performance computers and the impact on the computer industry).
\item[168.] See id.
\item[169.] See THE DECISION, supra note 107, at 4.
\end{enumerate}
\end{footnotesize}
Minister of Atomic Energy, Viktor Mikhailov, the computers were necessary for nuclear stockpile maintenance. Subsequent media reports indicated, however, that Russia planned to use the computers from Silicon Graphics to design nuclear warheads.

These events heightened Congress's concerns that the Clinton Administration's policies contributed to the proliferation of military-sensitive technology. To control computer exports to Computer Tier 3 countries, Congress limited the President's authority to change computer export control laws in the National Defense Authorization Act for Fiscal Year 1998 (NDAA).

The NDAA requires the President to prohibit the export or reexport of computers with a CTP level of more than 2000 MTOPS to a Tier 3 country if the Secretaries of Commerce, Defense, Energy, State, or the Director of the Arms Control and Disarmament Agency object to such export or reexport. If one of the above agencies objects, however, the
Secretary of Commerce may still issue a license without regard to the licensing exceptions provided by § 740.7 of the EAR.\textsuperscript{176}

In addition, a Presidential decision to increase the CTP level for Tier 3 countries cannot take effect until 180 days after the President submits a report to Congress setting forth the new CTP level and the justification for the increased level.\textsuperscript{177} The NDAA authorized the President to remove countries from the Computer Tier 3 country group.\textsuperscript{178} A decision to do so, however, becomes effective only 120 days after the President sends a report to Congress setting forth the justification for the deletion.\textsuperscript{179}

Finally, the NDAA requires the Secretary of Commerce to conduct a post-shipment verification of exports of high performance computers with a CTP level of more than 2000 MTOPS to Tier 3 countries.\textsuperscript{180} The post-shipment verification process identifies and prevents future diversions of computer technology to unauthorized end-users and end-uses.\textsuperscript{181}


The congressional response to the alleged unauthorized exports did not dissuade the Clinton Administration from further liberalizing com-

\begin{itemize}
\item[\textsuperscript{176}] See id. § 1201(c) (providing time limits for federal agencies to object to the export or reexport of a computer and authorizing the Secretary of Commerce to issue a license irrespective of objections). The export or reexport of the computer is authorized if no specified agency objects. See id.
\item[\textsuperscript{177}] See id. § 1211(d). The report to Congress must: (1) address the extent to which the computers with the adjusted CTP level are available from other countries, (2) address the potential military uses of computers with the new CTP level, and (3) assess the national security implications of such uses. See id.
\item[\textsuperscript{178}] See id. § 1211(e)(1)-(2) (conditioning the President's authority to remove a country from Tier 3 on the submission of a report to Congress setting forth the justification for the deletion). The President is not authorized to remove a country from the Tier 3 list if:
\begin{enumerate}
\item[(A)] the country is a "nuclear-weapon state" (as defined by Article IX of the Treaty on the Non-Proliferation of Nuclear Weapons) and the country is not a member of the North Atlantic Treaty Organization; or
\item[(B)] the country is not a signatory to the Treaty on the Non-Proliferation of Nuclear Weapons and the country is listed on Annex 2 to the Comprehensive Nuclear Test Ban Treaty.
\end{enumerate}
\item[\textsuperscript{179}] See id. § 1211(e)(3)(A)-(B).
\item[\textsuperscript{180}] See id. § 1213(a). The Secretary of Commerce is also required to submit an annual report to Congress with the results of the post-shipment verifications. See id. § 1213(c). The report must include "(1) the destination country[,] (2) the date of export[,] (3) the intended end use and intended end user[,] and (4) the results of the post-shipment verification." Id. § 1212(c)(1)-(4).
\item[\textsuperscript{181}] See THE DECISION, supra note 107, at 11 (discussing that the post-shipment verification process assures only that high performance computers are not physically diverted, and provides no assurance that computers are being used for military purposes).
\end{itemize}
In response to a dramatic increase in microprocessing power, President Clinton announced initiatives on July 1, 1999 and February 1, 2000 to amend again U.S. export controls on high performance computers. The Administration incorporated its July 1 proposal into EARs released on August 3, 1999. The EAR amendments, and the proposed amendments announced in February 2000, maintain the four computer tiers announced in 1995 but amend the countries in, and control levels for, those tiers.

The July 1999 amendments moved Hungary, Poland, the Czech Republic, and Brazil from Tier 2 to Tier 1. The Administration will consider moving other countries into Tier 1 at a later date.

For Computer Tier 2, the amendments raised the individual licensing level from 10,000 MTOPS to 20,000 MTOPS. The Clinton Administration’s February 2000 initiative proposed to increase this level to 33,000 MTOPS immediately. In addition, the Clinton Administration pro-
posed to move Romania from Computer Tier 3 to Computer Tier 2.\footnote{191}

For Computer Tier 3, the amendments maintained the two-level licensing system for civilian and military proliferation end-users, and raised individual licensing levels for both classes of end-users, from 2000 to 6500 MTOPS for military end-users and from 7000 to 12,500 MTOPS for civilian end-users.\footnote{192} The Clinton Administration announced in February 2000 that it plans to increase individual licensing requirements for military end-users from 6500 to 12,500 MTOPS for military end-users and from 12,300 to 20,000 MTOPS for civilian end-users.\footnote{193} The increase for civilian end-users became effective immediately.\footnote{194} The license level for military end-users, however, will become effective in August 2000.\footnote{195}

The July 1999 regulatory amendments increased the NDAA notification level from 2000 MTOPS to 6500 MTOPS.\footnote{196} The February 2000 initiative calls to increase the NDAA notification level to 12,500.\footnote{197} The NDAA permits Congress to review the decision to increase the threshold performance level for a sixth month period, at which time the NDAA notification level goes into effect.\footnote{198} Neither the July 1999 nor the Febru-

\footnote{191. See id. (stressing that Romania's move to Computer Tier 2 will not become effective until Congress has had the opportunity to review the proposal for the NDAA-required 120 day period).}

\footnote{192. See Revision of High Performance Computer Licensing Policy, 64 Fed. Reg. at 42,010 (providing amendments to the EAR for Computer Tier 3 countries). The Clinton Administration maintained a lower threshold for military end-users than civilian end-users because Computer Tier 3 countries pose the greatest risk to U.S. national security. See Clinton's Statement, supra note 184, at 1247 (explaining the considerations the Administration undertook to determine the appropriate CTP levels for Computer Tier 3 countries). Nevertheless, the Administration increased CTP levels from 2000 MTOPS to 6500 MTOPS for military end-users and end uses for Computer Tier 3 countries in light of this security risk. See Revision of High Performance Computer Licensing Policy, 64 Fed. Reg. at 42,010. The Administration explains in its regulatory amendments that "[t]his level reflects the Administration's determination that widespread commercial availability makes computers with a performance of 6500 MTOPS or less uncontrollable." Id. The new level of 6500 MTOPS for military end-users became effective on January 23, 2000. See February Fact Sheet, supra note 184, at 2.}

\footnote{193. See February Fact Sheet, supra note 184, at 2.}

\footnote{194. See id.}

\footnote{195. See id. (noting that the increase for military end-users will not become effective for another six months because the NDAA permits Congress to review increases for a six-month period).}

\footnote{196. See id. (reminding exporters that, until Congress reviews this change, they must continue to give Congress advance notification of any exports or reexports of computers with a CTP greater than 2000 MTOPS to Computer Tier 3 destinations).}

\footnote{197. See id. (discussing the proposal to increase the NDAA notification requirement).}

\footnote{198. See id. (summarizing the process of the President's decision to raise the NDAA notification level and the process to effectuate that decision).}
ary 2000 initiatives announced changes for Tier 4 countries.¹⁹⁹

E. Congress Takes a Step Into the Ring: The Export Administration Act of 1999

On October 8, 1999, Senator Phil Gramm introduced legislation to reauthorize and reform the 1979 Act.²⁰⁰ In several ways the legislation complements the Clinton Administration's latest EAR revisions and announcement to further revise export controls in February 2000.²⁰¹ In particular, the legislation includes several provisions that will impact the regulation of computer exports, including provisions to: (1) establish a country tiering mechanism,²⁰² (2) strengthen the foreign availability exemption²⁰³ and create a mass market status,²⁰⁴ (3) establish a National Security Control List,²⁰⁵ and (4) reduce the amount of time Congress may review Presidential decisions to increase CTP levels for Computer Tier 3

¹⁹⁹. See id. at 2-3; July Fact Sheet, supra note 174, at 3 (stating that there are no planned changes to the Computer Tier 4 licensing group).

²⁰⁰. See Export Administration Act of 1999, S. 1712, 106th Cong. § 1 (1999); see also S. REP. NO. 106-180, at 1-2 (1999) (providing that the purpose of the legislation is to update national security export controls to reflect the current world situation).


²⁰². See id. (proposing to establish a country tiering system for all commodities on the Commerce Control List that resembles the Computer Tier System established in 1996).

²⁰³. See id. § 211 (amending the current foreign availability exemption by permitting interested parties to petition the Secretary of Commerce to conduct a foreign availability analysis).

²⁰⁴. See id. (establishing an exemption for a commodity with a mass-market status). A commodity achieves mass market status if it: (1) is produced and is available for sale in a large volume to multiple purchasers, (2) is widely distributed through commercial channels, (3) is conducive to shipment and delivery by normal commercial means, and (4) may be used for its normal intended purpose without substantial modifications. See id. § 211(d)(2). The Secretary of Commerce cannot require an export license for a commodity with a mass-market status. See id. § 211(c) (requiring the removal of the commodity from the National Security Control List, and prohibiting the requirement of a license or other authorization to export the commodity).

²⁰⁵. See id. § 202 (requiring the Secretary of Commerce to establish and maintain a National Security Control List that balances the national security risks of not controlling the commodity and the economic costs associated with its control). The National Security Control List must be consistent with the proposed provisions relating to the purposes of national security controls:

(1) To restrict the export of items that would contribute to the military potential of countries so as to prove detrimental to the national security of the United States or its allies.

(2) To stem the proliferation of weapons of mass destruction, and the means to deliver them, and other significant military capabilities[.]

(3) To deter acts of international terrorism.

Id. § 201(b).
countries.\textsuperscript{206} The legislation also enhances enforcement of export control violations.\textsuperscript{207}

II. REIGNITING THE HISTORICAL DILEMMA: RECENT REFORMS FALL SHORT OF STRIKING THE BALANCE BETWEEN NATIONAL SECURITY AND ECONOMIC INTERESTS

With the most recent revisions and proposed amendments to the EAR, the Clinton Administration continued to liberalize export controls in the wake of technological advancements and consistent lobbying\textsuperscript{208} by the high technology industry.\textsuperscript{209} The Clinton Administration intends to relax export controls further, although members of Congress indicated their desire to tighten export controls in light of the recent computer espionage involving the People's Republic of China.\textsuperscript{210} An analysis of the Clinton Administration's justification for revising the EAR and the decisionmaking process for increasing composite theoretical performance levels demonstrates the difficulty in obtaining a balance between national security and economic interests.

A. The Clinton Administration's Formula

The Clinton Administration's latest reforms are yet another attempt to strike a balance between competing economic and national security in-

\textsuperscript{206} See id. § 211(c)(2) (striking "180" and inserting "60" in the second line of Section 1211(d) of the National Defense Authorization Act for Fiscal Year 1998). This provision substantially reduces congressional review of the President's decision to change CTP levels for Computer Tier 3 countries, although President Clinton wishes to reduce congressional review to thirty days. \textit{See July Fact Sheet, supra} note 174, at 3 (announcing that the Administration intends to work with Congress to reduce congressional review to thirty days to allow the Administration to respond to technological changes).

\textsuperscript{207} \textit{See Export Administration Act of 1999, S. 1712, 106th Cong.} § 607 (1999) (providing increased penalties, a strengthened post verification process, and a "Patriot" provision that allows informants to report violations and receive awards in those cases that result in conviction).


\textsuperscript{209} \textit{See White House Eases Exports on Computers; Old Regulations Didn't Keep Up}, \textit{CIN. ENQUIRER}, July 2, 1999, at A8 (reporting that the Clinton Administration eased export controls because export control regulations did not keep pace with computer technology).

\textsuperscript{210} \textit{See generally, COX REPORT, supra} note 24, at 172-73 (summarizing recommendations to strengthen export control laws). \textit{But see} Bruce Stokes, \textit{Lethal Exports}, 31 \textit{NAT'L J.} 1473, 1475 (1999) (noting that 79 members of Congress called on President Clinton to increase the MTOPS threshold in May, 1999).
terests. Under Secretary of Commerce, William A. Reinsch, explained recently that the Clinton Administration's policy is based on the following equation: "exports=healthy high-tech companies=strong defense." In other words, if the high technology industry is able to export its goods to foreign markets, high technology industries will continue to prosper. Moreover, if the high technology industry remains strong, it can continue to aid U.S. military development and enhance U.S. national security.

B. Justifying the Relaxation of Export Controls and Solving the Equation

According to the Clinton Administration, the key to solving the "exports=healthy high-tech companies=strong defense" equation requires relaxing burdensome licensing requirements and providing the President the flexibility to change export control laws.

1. Burdensome Licensing Requirements Stifle Computer Industry Competitiveness

A fundamental concern of the Clinton Administration is the excessive nature of U.S. export controls on dual-use commodities. Historically,

211. See July Fact Sheet, supra note 174, at 1; see also February Fact Sheet, supra note 184, at 1 (announcing that the update export control laws would enhance U.S. national security, improve the U.S. export control system, and eliminate unnecessary and burdensome regulations on both government and industry).

212. Reinsch Speech, supra note 15, at 2 (stating that this policy seeks to prevent export controls from crippling the high-tech industry and in turn, setting back U.S. military development).

213. See id. (noting that the high technology industry significantly relies on exports for sales).

214. See id. The United States military has increasingly relied on Commercial Off the Shelf items (COTS) due to budgetary constraints and the inability of the military industrial base to keep pace with technological advancements. See id. The U.S. military establishment turned to the civilian sector to meet its needs. See id. High performance computer technology is utilized, among other military applications, for "smart weapons," weapons design and test simulation, command, control and communications functions. Id. Under Secretary Reinsch explained that because of this reality, it is imperative that the high technology industries remain a vibrant sector of the U.S. economy in order to maintain military superiority. See id.

215. See White House to Loosen Curbs on PC Exports, ASIAN WALL ST. J., July 2, 1999, at 6 (quoting President Clinton's remarks that "a strong, vibrant high-technology industry is in America's national security interests"); see also Hoydysh Testimony, supra note 182, at 1 (stating that U.S. national security is tied to U.S. technological leadership).

216. See generally Clinton's Statement, supra note 184 (advocating to work with Congress to relax export controls and to reduce the time period before regulations can go into effect to maintain the strength of the computer industry).

217. See infra note 220 and accompanying text (discussing the Clinton Administration's concern that U.S. industries could potentially lose four billion dollars in revenue due to the excessive nature of U.S. export control laws).
the U.S. high technology industry sacrificed its competitiveness to comply with U.S. export control laws.\textsuperscript{218} In 1993, for example, Robert E. Allen, Chairman of American Telephone & Telegraph Co. (AT&T), testified before Congress that export controls would cause AT&T to lose approximately $500 million in sales over five years to competitors.\textsuperscript{219} Most recently, the President's Chief of Staff, John Podesta, stated that without changes to export controls, the United States would lose four billion dollars in sales over the next four years.\textsuperscript{220}

The concern over export controls grew recently with the emergence of new foreign competition.\textsuperscript{221} The United States and Japan no longer have a monopoly over the production of high performance computers.\textsuperscript{222} Producers from Europe, Taiwan, and South Korea accompany the United States and Japan.\textsuperscript{223} To worsen matters for U.S. producers, many competitors are not subject to the same stringent export control laws as those

\textsuperscript{218} See 145 CONG. REC. E827 (daily ed. May 3, 1999) (complaining that license requirements to Tier 3 countries may take as long as 30 days, causing U.S. corporations to cede sales to foreign competitors); see also Bob Deans, \textit{Clinton to Loosen Rules for Computer Exports}, \textit{AUSTIN AM.-STATESMAN}, July 2, 1999, at A12 (explaining that changes to export control laws were necessary to prevent U.S. producers from losing out on a global market of five million high performance computers per year); \textit{ELECTRONIC INDUSTRIES ALLIANCE, EIA Lays Out Guidelines for Information Age Export Controls} (Press Release, March 3, 1999) (visited Feb. 19, 2000) <http://www.eia.org/PAD/PRESS/FILES/99-14.html> (stating that the “U.S. high-technology companies cannot compete effectively with the global marketplace because of outdated, burdensome, and unilateral export controls”).

\textsuperscript{219} See \textit{Export Controls on Advanced Telecommunications: Hearings Before the Subcomm. on Econ. Policy, Trade and Env't of the House Comm. on Foreign Affairs, 103rd Cong.}, 46, 48 (1993) (statement of Robert E. Allen, Chairman of AT&T) (discussing the potential impact of U.S. export control laws on AT&T sales).


\textsuperscript{221} See generally id. at 1-2.

\textsuperscript{222} See Maibach Testimony, supra note 10, at 4. Mr. Maibach summarized the competition as:

[Fourteen] of the top 25 manufacturers of workstations are foreign; 10 of the top 25 manufactures of mid-range, mainframe and upper range servers are foreign; 15 of the top 25 manufacturers of personal computers are foreign; [f]oreign competition exists even for the most powerful supercomputers—3 Japanese companies (Hitachi, NEC, and Fujitsu) manufacture half of the top 25 most powerful computers in the world.

\textit{Id.}

\textsuperscript{223} See \textit{Press Briefing}, supra note 220, at 1 (stating that European, Japanese, Taiwanese, and South Korean producers will capture 22% of the global computer market by 2000).
that exist in the United States.\textsuperscript{224} Thus, foreign competitors are able to seize opportunities to penetrate emerging markets, such as in Russia and China, while U.S. producers sit at bay watching potential opportunities slip away.\textsuperscript{225}

2. An Attempt to Provide a Level Playing Field

The Clinton Administration seeks to place U.S. producers on a level playing field with competitors by increasing the CTP levels for Computer Tiers 2 and 3 countries, moving several countries to Tier 1, and switching Romania from Tier 3 to Tier 2.\textsuperscript{226} The higher CTP levels reflect the continued technological advancements in the computer industry and the inability of the Department of Commerce to control effectively the sales of computers below the present CTP levels.\textsuperscript{227}

\textsuperscript{224} See id. (noting that many countries do not have reexport controls); see also Steinbrecher, supra note 38, at 688-91 (discussing the effects of self-imposed hindrances on U.S. exports). But see THE DECISION, supra note 107, at 13 (noting that Japanese and German producers, who directly compete with U.S. producers for high performance computer sales, are subject to national laws that afford similar levels of protection as do U.S. export control laws).

\textsuperscript{225} Cf. Bob Davis & Helene Cooper, White House to Loosen Curbs on Export of Computers to China, Other Nations, WALL ST. J., July 1, 1999, at A24 (quoting Rhett Dawson, president of Information Technology Industry Council, as saying, "[f]ailure to update the current thresholds will result in a loss of competitiveness for U.S. computer companies as they lose important markets to foreign competition"). But see THE DECISION, supra note 107, at 12 (commenting that subsidiaries of U.S. companies dominate foreign markets for general computer technology, and identifying only two global competitors for high-end computer systems). The GAO report indicates also that U.S. competitors sold only a small amount of high performance computers to Computer Tier 3 countries, thus implying that U.S. producers are not losing out on market opportunities to competitors. See id.

\textsuperscript{226} See Press Briefing, supra note 220, at 2-3 (statement by William Daley, Secretary of Commerce) (commenting that the President’s decision to relax computer export controls will ensure that the United States remains competitive in the global marketplace).

\textsuperscript{227} See High Performance Computer Export Policy: Hearing Before the Senate Subcomm. on Int’l Sec., Proliferation, and Fed. Serv., 105th Cong. (1998), available in 1998 WL 18088462, at *1-2 (statement of William Reinsch, Under Secretary, Export Administration, Department of Commerce) [hereinafter Reinsch Computer Testimony] (commenting on the problems posed by technological developments in attempts to control the proliferation of high performance computers). Under Secretary Reinsch identified four factors that cause difficulties in controlling the proliferation of high performance computers. See id. at 1. First, rapid advancements in microchip technology will lead to the mass production of microchips capable of 2000 MTOPS by the end of 1999. See id. at 2-3. Second, other technological advancements, including increased sophistication of software and interconnect technologies, permit end-users to “cluster” together several low-end systems to give a higher CTP level. See id. at 3. Third, manufacturers are building computer platforms that are easily upgraded. See id. (referring to the attainable performance or scalability of a computer). Therefore, a buyer can purchase a computer with a CTP threshold level permitted by U.S. export control laws and upgrade easily to 5000 or 6000 MTOPS or
a. Technological Advancements Charge Ahead of Export Controls

The continued advancement of computer technology places pressure on export controls. Department of Commerce Secretary, William Daley, highlighted this pressure in a July 1, 1999 press conference when he warned that, absent changes to export control laws, export controls would subject a Sony Playstation to control. To avoid the absurdity of controlling a video game system, the Clinton Administration increased the CTP levels for Computer Tier 3 countries from 2000 MTOPS to 6500 MTOPS for military end-users and from 7000 MTOPS to 12,300 MTOPS for commercial end-users.

b. Controllability of High Performance Computers

Difficulty with respect to control provoked the Clinton Administration to raise the level for Computer Tier 3 countries to 6500 MTOPS in July 1999. Administration officials note that commercial chips are expected to increase from 2500 to over 5000 MTOPS by the end of the year. These microprocessors are shipped by the millions throughout the world. In addition, technological advancements such as parallel processing, interconnect technologies, and scalability contribute to the difficulties in controlling computer technology. Consequently, the Clinton Administration concluded that it could not prevent U.S. adversaries from acquiring high performance computer technology below a CTP level of 6500 MTOPS. Critics of the Administration’s policies balk at this line more once the computer reaches the destination country. See id.

228. See Press Briefing, supra note 220, at 1 (explaining that advances in microprocessors have significantly improved performance levels). Single microchips increased to over 5000 MTOPS. See id.

229. See id. at 1-2 (stating that technological advancements are aggravating the efficacy of export controls).

230. See id. at 2-3.

231. See Davis & Cooper, supra note 225, at A24; see also supra note 192 and accompanying text (discussing the Clinton Administration’s proposal to increase further MTOP levels for computer exports to Computer Tier 3 countries).

232. See Press Briefing, supra note 220, at 1-2 (stating that the President, Vice President, and the National Security Council agree that it is not possible to control the export of computers below 6500 MTOPS).

233. See id. at 1 (discussing the latest developments in computer technology); February Fact Sheet, supra note 184, at 1 (predicting that individual chips would be available for commercial sales by late 2000).

234. See Press Briefing, supra note 220, at 1-2 (noting that U.S. producers sold over twenty-one million laptops, servers, and PCs containing these microprocessors to Europe and Asia alone in 1997).

235. See Reinsch Computer Testimony, supra note 227, at 1.

of reasoning.237

C. Are Business Interests Dictating Export Controls at the Expense of National Security?

Proponents of national security interests contend that the Clinton Administration is jeopardizing national security in favor of business interests.238 Critics even imply that campaign contributions from high technology industries influenced the Clinton Administration to amend export control laws in favor of business interests.239 The influence of campaign contributions aside, other critics assert that the Administration's export control policies do not consider adequately the military applications of high performance computers.240 In addition, critics argue that the Ad-

237. See generally Amy Kaslow, Arms Control v. Saving Jobs, CHRISTIAN SCI. MONITOR, Jan. 24, 1994, at 11 (reporting on the criticisms of the Clinton Administration's decision to liberalize export controls).


Dr. Leitner testified that the Administration's policies will impart to potential adversaries and proliferators the ability to design, model, prototype, and develop weapons of mass destruction. See Leitner Testimony, supra, at 113. But see Press Briefing, supra note 220, at 3-4 (statement of John Hamre, Deputy Secretary of Defense) (reassuring the public that the Administration extensively reviewed all security concerns and concluded that the August 3, 1999 amendments did not jeopardize U.S. national security).

239. See Leitner Testimony, supra note 238, at 113 (stating that the Clinton Administration's push to liberalize export controls is "widely seen as a pay off for generous campaign support and contributions"); see also Stone, supra note 238, at 2928 (implying that President Clinton advocated regulatory changes benefiting the high technology industry as a result of political support and contributions). President Clinton appointed heads of the Departments of Commerce and Defense, as well as the Central Intelligence Agency, that were sympathetic to industry desires to increase exports. See id. In fact, then Secretary of Defense William Perry announced in 1994 that curbing dual-use exports was a "hopeless task." Id. (commenting that former Secretary Perry's view led to the dissolution of CoCom). But see Press Conference with Members of the House Select Comm. on U.S. Nat'l Sec. and Military/Commercial Concerns with the People's Republic of China (visited Feb. 19, 2000) <http://web.lexis-nexis.com/congcomp/doc> (May 25, 1999) (statement of Rep. Robert Scott (D-VA)) [hereinafter Press Conference] (observing that government witnesses who testified before the U.S. National Security and Military/Commercial Concerns with the People's Republic of China Select Committee responded universally that no political pressure influenced their decision to change export controls).

240. See, e.g., THE DECISION, supra note 107, at 6-7 (discussing the Administration's
administration is pursuing a reckless policy of increasing CTP threshold levels, despite inadequate mechanisms to prevent the diversion of such higher performing computers to U.S. adversaries. Moreover, critics maintain that the Administration did not pursue other alternatives that pose less risk to U.S. national security, such as tightening multilateral controls on computers through either Wassenaar or an international agreement similar to the Supercomputer Control Regime.

1. Deficient Studies Result in an Arbitrary Decision-Making Process

In 1995, the Center for International Security and Arms Control at Stanford University conducted a study on behalf of the Clinton Administration to analyze computer export controls and recommend an appropriate threshold CTP level for export control purposes. The Clinton Administration adopted this study's findings and conclusions, which led eventually to the Administration's decision to liberalize export controls in 1996, and in large part, to its decisions to revise the EAR in July 1999 and February 2000.

In a 1998 report, the General Accounting Office (GAO) reported several deficiencies in the Stanford study to Congress. First, the study lacked empirical evidence to support its conclusion that high performance computers were not controllable based on (1) wide availability.

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241. See, e.g., John Maggs, Secrets Shanghaied, 31 NAT'L J. 1454, 1461 (1999) (stating that the United States cannot verify reliably that the diversion of high performance computers to illegitimate end-users is not preventable).

242. See Stone, supra note 238, at 2927 (discussing national security experts' criticisms of the Clinton Administration's failure to develop an effective international control regime).

243. See GOODMAN ET AL., supra note 41, at vi (summarizing the purpose of the report and its key findings).

244. See THE DECISION, supra note 107, at 2 (summarizing the conclusions of the Stanford study). The Stanford study concluded that:

(1) U.S.-manufactured computer technology between 4,000 and 5,000 millions of theoretical operations per second (MTOPS) was widely available and uncontrollable worldwide, (2) U.S.-manufactured computer technology up to 7,000 MTOPS would become widely available and uncontrollable worldwide by 1997, and (3) many HPC applications used in U.S. national security programs occur at about 7,000 MTOPS and at or above 10,000 MTOPS.

Id. at 2 (footnote omitted) (describing the key findings of the report).

245. See id. (stating that the Stanford study was a "key element" of the Clinton Administration's efforts to revise export controls in 1996).

246. See id. at 4.

247. See id. at 4-7.

248. See id. at 6. According to the GAO, the study concluded that, "without empirical
and (2) inadequate resources to control them. Second, the study did not review the military applications of high performance computers with increased CTP levels.

Because of these deficiencies in the Stanford study, and the Administration’s subsequent reliance on its findings to revise export controls, critics argue that the United States is contributing to the proliferation of military weaponry in countries of national security concern. In addi-

evidence or analysis,” computers from 4000 to 5000 MTOPS were widely available and that computers with 7000 MTOPS would be just as available by 1997. Furthermore, the GAO report indicated that the Executive Branch “could not explain nor provide documentation” as to how it decided to set CTP level at 2000 MTOPS for Computer Tier 3 military end-users, even though the Stanford study concluded that computers with 5000 MTOPS were uncontrollable. In its own review of the market, the GAO report concluded that subsidiaries of U.S. companies dominated the overseas markets. See id. at 12; NATIONAL SECURITY ISSUES, supra note 110, at 4 (stating that not once did U.S. producers lose sales to foreign high performance computer vendors in Computer Tier 3 countries). In addition, the GAO found that Computer Tier 3 countries had minimal capabilities of their own to produce high performance computers of comparable quantity and quality, as compared to the major suppliers of these computers, including the United States, Japan, and Germany. See THE DECISION, supra note 107, at 5.

249. See THE DECISION, supra note 107, at 4 (concluding that “the study lacked empirical evidence or analysis to support its conclusion that [high performance computers] were uncontrollable based on . . . insufficient resources”).

250. See id. at 7-8 (discussing the limited review by the Stanford Institute of military applications of high performance computers with an increased CTP level). The Stanford study authors indicated that they did not assess the military applications of high performance computers because there was virtually no government data to make such an assessment. See id. at 7. In fact, as of 1998, the Department of Energy’s study on the application of high performance computing in nuclear test simulations and design was the only study that the Clinton Administration conducted. See CHANGES IN CONTROLS, supra note 41, at 7. According to the Department of Commerce, even this study did not factor into the Clinton Administration’s decision to revise export controls. See THE DECISION, supra note 107, at 7. Nevertheless, Representative Christopher Cox (R-CA) identified several other military applications of high performance computing technology, including, “nuclear, chemical, and biological weapons, tactical aircraft, cruise and ballistic missiles, submarines, anti-submarine warfare, command, control, and communications, [and] information warfare.” COX REPORT, supra note 24, at 102.

251. See, e.g., Maggs, supra note 241, at 1460; Milhollin Testimony, supra note 21, at 30 (highlighting the acquisition of high performance computers by countries that may possibly threaten U.S. national security). Decontrolling export controls, for example, led to the Indian Institute of Science’s acquisition of supercomputers. See id. This institute is India’s main missile research site. See id. In addition, Chinese and Russian nuclear weapon and missile research laboratories have acquired supercomputing technology from U.S. producers. See id. As a result, computing power available now to Russia increased by a factor of ten, and China is capable now of producing the DF-5 intercontinental missile that can carry nuclear warheads. See id. But see Reinsch Computer Testimony, supra note 227, at 4 (stating that high performance computers are not essential to making military weaponry). Under Secretary Reinsch explains that computer technology “is not a choke point for military production.” Id. In other words, acquiring high performance computers alone will not improve a country’s military-industrial capabilities. See NATIONAL SECURITY ISSUES,
tion, critics contend that U.S. military strategic advantage is therefore minimized by the proliferation of high performance computing technology.

2. Post-Verification Process Proves Ineffective: Damage Inflicted Once Computers Leave the United States

The risks associated with the proliferation of more sophisticated computing technology, as a result of relaxing export controls, are compounded by the Executive Branch's inability to prevent the diversion of computer technology to unauthorized end-users. Once the Department of Commerce issues a license, it is virtually impossible to prevent the commodity's diversion to an unauthorized end-user.

In 1998, Congress established a post-verification system as an oversight mechanism to ensure that diversions did not occur. As Representative

supra note 110, at 17 (containing a letter from Commerce Secretary Daley, which explains that once a country acquires a computer over a few hundred MTOPS, the acquisition of computers with a higher performance level is insignificant for military weaponry development). Secretary Daley elaborated in his August, 1998 letter to Harold Johnson of the GAO, that other factors such as "'skill in software design, access to sophisticated manufacturing techniques, experience and test data in weapons design—are much more important than computer performance.'" Id. at 19 (quoting Secretary Daley's letter).

252. See, e.g., Bryen Testimony, supra note 238, at 67 (discussing the marginalization of U.S. military superiori as a result of supercomputer transfers to U.S. adversaries); see also U.S. Supercomputer Export Control Policy: Hearing Before the House Comm. on Nat'l Sec., 105th Cong. 8 (1997) (statement of Mitchel B. Wallerstein, Deputy Assistant Secretary for Counterproliferation Policy, Department of Defense) [hereinafter Wallerstein Testimony] (stating that export controls on high technology commodities are essential to maintaining U.S. military superiority). But see Reinsch Speech, supra note 15, at 2-3 (arguing that denying U.S. producers the opportunity to sell supercomputers to countries such as China would threaten U.S. national security because it would: (1) encourage China and other countries to produce their own supercomputers, causing the U.S. to lose all control over supercomputer technology, and (2) effect adversely the strength of the U.S. high technology industry upon which the U.S. military relies for cutting edge technology for weaponry systems).

253. See THE DECISION, supra note 107, at 11 (discussing the limitations of the post-verification system in preventing diversions). The GAO reported to Congress in 1998 that the post-verification system is unable to detect physical diversions of computer technology to unauthorized end-users, is limited by the inexperience of government officials in computer-specific training, and is reduced by the preclusion of U.S. officials from conducting post-verifications by foreign countries. See id. at 11-12; COX REPORT, supra note 24, at 134-37 (discussing the limitations of the post-verification system to verify the end-user of commodities exported to China).

254. See Press Conference, supra note 239, at 4 (remarks of Rep. Christopher Cox (R-CA) (stating that currently the United States does not have a means to prevent high performance computers from being diverted to "third world and rogue states that engage in unpredictable behavior").

Jim Gibbons (R-NV) stated, however, "the policy is one of closing the door after the cow has got out of the barn." In other words, it is meaningless to verify the diversion of supercomputers after the fact, because the unauthorized end-user already possesses the benefits of the technology. In response to this problem and the Administration's continued efforts to relax export controls, public policy makers propose strengthening the post-verification process.

3. The United States Takes a Back Seat: Failing to Lead the International Arena in Establishing Export Controls

Lastly, critics contend that the Administration failed to lead efforts to control the proliferation and diversion of computers on an international level. Critics argue that the United States—a leading producer of high performance computers in an industry with a limited number of foreign producers—should lead efforts to strengthen Wassenaar, CoCom's successor, or formulate an international agreement similar to the Supercomputer Control Regime.

III. HOW TO STRIKE A BETTER BALANCE

The Clinton Administration's recent EAR revisions respond to technological innovations in the computer industry and concerns that export controls will impede an industry vital to both the economic success and

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257. See id.

258. See generally Cox Report, supra note 24, at 173 (recommending ways to improve the post-verification system with respect to China). The recommendations made by the Cox Report include: (1) the requirement that China establish an "open and transparent system" that permits the United States to verify the end-use of commodities, (2) lowering the CTP levels of computers allowed for export under current regulations if such a system is not established, and (3) conducting an independent evaluation of enhancing the post-verification system. Id.

259. Cf. Leitner Testimony, supra note 238, at 118 (stating that the United States is taking the lead in the opposite direction by scrapping national security controls in favor of market share). Dr. Leitner pointed out the United States's irresponsibility on the international level that was attributed to the United States's 1998 proposal to decontrol virtually all telecommunication technology and equipment from Wassenaar controls. See id. at 118-19; see also Wallerstein Testimony, supra note 252, at 12-13. Deputy Assistant Secretary Wallerstein explained that the United States has not presented a credible case to other governments for controlling military sensitive technology in the post Cold War era. See id.

260. See, e.g., S. 1712, 106th Cong. § 607 (1999) (providing provisions to strengthen the post verification process); see also Cox Report, supra note 24, at 173 (recommending strengthening post-verification procedures for computer exports to China).
national security of the United States. The Clinton Administration, however, failed to analyze adequately the implications these reforms have on U.S. national security interests or minimize the risks associated with proliferation and diversion of high performance computers. To respond to these shortcomings, the Clinton Administration should take affirmative steps to establish objective criteria for raising CTP levels, enhance the post-verification process, and strengthen multilateral export controls.


The 1998 GAO study identified a critical weakness in President Clinton's decision to increase CTP levels in 1996: this decision was made arbitrarily by bureaucrats within the federal government. The Clinton Administration claimed that it increased CTP levels after conducting extensive studies, such as the Stanford study. The GAO report concluded, however, that the Stanford study, in and of itself, lacked empirical evidence and analysis to support its conclusions. There is evidence to suggest that government officials arbitrarily decided to increase CTP levels in August 1999 and February 2000 as well.

261. See White House Eases Limits on Exports of Computers, GREENSBORO NEWS & REC., July 2, 1999, at A4 (reporting that an Intel spokesperson stated in response to the reforms: "this is good progress . . . we're encouraged about the president's willingness to work with Congress in a bipartisan look at a long-term solution"); see also Maibach Testimony, supra note 10, at 5-6 (stating that the computer industry is a vital component of U.S. economic productivity and protection of U.S. national security interests).

262. Cf THE DECISION, supra note 107, at 14 (concluding that the Stanford study was inadequate in its analysis of critical issues).

263. See infra notes 266-87 and accompanying text (discussing the arbitrary nature of the current decision making process and recommending objective criteria to validate the process).

264. See infra notes 288-305 and accompanying text (discussing recommendations to improve post-shipment verification).

265. See infra notes 306-17 and accompanying text (recommending that multilateral export controls be strengthened).

266. See THE DECISION, supra note 107, at 5-8 (discussing the Stanford study's weakness and President Clinton's subsequent decision to relax export controls).

267. Cf id. at 6 (implying the Administration made decisions arbitrarily, as the Administration could not provide empirical support for its decision to revise export controls).

268. See, e.g., Tarbell Letter, supra note 147, reprinted in THE DECISION, supra note 107, at 44 (stating that the Stanford study was just one of many sources contributing to the decision to revise export controls).

269. See THE DECISION, supra note 107, at 4; see also supra notes 243-52 and accompanying text (discussing the deficiencies of the Stanford study).

270. See generally, Revision of High Performance Computer Licensing Policy, 64 Fed.
Moreover, the Administration has not conducted appropriate studies to determine the potential military application of computers with a higher CTP level.\textsuperscript{271} The sole study to date analyzes the application of high performance computers with only regard to nuclear weapons technology.\textsuperscript{272} Previously, the Department of Defense identified that high performance computers have numerous other strategic military applications;\textsuperscript{273} however, no threat assessment studies were undertaken to determine the impact of increasing CTP levels on these military applications.\textsuperscript{274}

The Clinton Administration should work with Congress to develop objective criteria to determine the appropriate CTP levels.\textsuperscript{275} Objective criteria should be established for the following areas: (1) the foreign availability of high performance computers at various CTP levels, (2) the cost to government to regulate export controls,\textsuperscript{276} (3) the economic impact on the computer industry,\textsuperscript{277} (4) a threat assessment of increasing CTP levels on the U.S. national security interests, and (5) the potential for multilateral control.\textsuperscript{278}

\textsuperscript{271} See THE DECISION, supra note 107, at 7.

\textsuperscript{272} See NATIONAL SECURITY ISSUES, supra note 110, at 3 (concluding that high performance computers over 2000 MTOPS are not widely available without restriction from foreign sources).

\textsuperscript{273} See THE DECISION, supra note 107, at 7 (commenting that, with the exception of the Department of Energy study that reviews the application of high performance computing technology in nuclear weapons programs, the executive branch has identified no other military application of such technology).

\textsuperscript{274} See COX REPORT, supra note 24, at 102 (listing examples of other military applications of computer technology).

\textsuperscript{275} See THE DECISION, supra note 107, at 7-8 (stating that the U.S. Department of Defense did not conduct a threat assessment because it was not asked to); see also Bryen Testimony, supra note 238, at 65-66 (stating that the defense department has not evaluated the impact of technology transfers to countries, such as China, on U.S. national security).

\textsuperscript{276} See generally July Fact Sheet, supra note 174, at 3 (stating that the Administration intends to work with Congress to develop an export control approach “that does not rely on ad hoc judgements about appropriate levels of control”).

\textsuperscript{277} For a general discussion on the costs involved with imposing export controls, see Steinbrecher, supra note 38, at 688-91 (summarizing the costs to businesses and the federal government with respect to the imposition of export controls on high performance computers).

\textsuperscript{278} See, e.g., THE DECISION, supra note 107, at 15 (recommendng similar objective
The development of objective criteria for assessing the potential threats of increasing CTP levels will require the Clinton Administration to conduct additional studies, beyond reviewing the application of high performance computers to nuclear weapons technology. The studies must determine the application of high performance computers in other military weaponry. The importance of these studies lies in determining the proper threshold at which computers with increased CTP levels risk U.S. national security. The following questions must be answered to reach such a determination: (1) What are the potential military applications of high performance computers with “X” CTP level? If the high performance computers with a “X” CTP level are either legally exported or illegally diverted to foreign military end-users and used for “Y” military system, can the United States maintain its military superiority over its adversaries armed with “X” CTP level technology? How far is the United States willing to allow the military superiority gap to close? (4) What are the likely costs, in real dollar terms, of maintaining U.S. superiority if “X” CTP level computers are exported to U.S. adversaries?

criteria). The GAO recommends that the Department of Defense conduct an analysis of the national security impact posed by exports of high performance computers to countries with national security and proliferation concerns. See id. The GAO recommends that this assessment respond to the following questions: “(1) how and at what performance levels countries of concern use HPCs for military modernization and proliferation Activities; (2) the threat of such uses to U.S. national security interests; and (3) the extent to which such HPCs are controllable.” Id.

279. See, e.g., COX REPORT, supra note 24, at 172 (calling for legislation to require the Executive Branch to conduct comprehensive studies on the application of high performance computing, clustering, and parallel processing technology in national security applications).

280. See id. at 102 (noting there are several other military applications that utilize high performance computing technology).

281. See, e.g., THE DECISION, supra note 107, at 15 (recommending that the Secretaries of Defense, Energy, and State, as well as the Director of the U.S. Arms Control Disarmament Agency, jointly evaluate and develop options to safeguard U.S. national security interests with respect to high performance computing technology; see also COX REPORT, supra note 24, at 173 (recommending the intelligence community conduct an annual threat assessment of exporting high performance computers to China).

282. See THE DECISION, supra note 107, at 15 (recommending assessments of how and what performance levels countries of security concern use high performance computing technology to modernize or develop military weaponry).

283. See generally Wallerstein Testimony, supra note 252; see also supra note 252 and accompanying text (noting that export controls are essential to maintaining U.S. military superiority).

284. See supra note 252 and accompanying text.

285. Cf. Cupitt Testimony, supra note 23, at 1 (maintaining that export controls are a relatively low cost means of preventing the proliferation of military sensitive technology).
The answers to these questions will allow policymakers to reach a well-informed decision before increasing CTP levels. The questions consider potential military application of the technology exported, the importance of maintaining U.S. military superiority, and the reality of spending limitations for defense purposes.

B. A Post-Verification System

Once a well-informed decision is made to export high performance computers abroad, government officials must possess an effective means to verify that the exported commodity is used for the purpose specified by the license application, and is not diverted illegally to unauthorized end-users. The current system, however, is vulnerable to criticism.

Strengthening the post-verification process also depends upon a number of factors. First, the Department of Commerce must train government officials adequately to conduct post-verification reviews. Second, licensing officers must be involved in the post-verification process. Currently, there is no connection between those officers that place conditions on license applications and those that actually conduct the post-verification of high performance computers exported under the license application. This permits license approval even though government officials lack adequate information with respect to an exporter's compliance history.

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286. See supra notes 266-274 and accompanying text (discussing the deficiencies in the prior decision making process).

287. See supra notes 282-85 and accompanying text (presenting questions for consideration prior to raising CTP levels).

288. See generally Department of Commerce's Export Licensing Process: Hearing Before the Senate Comm. on Governmental Affairs, 106th Cong. (1999), available in 1999 WL 20009198 (statement of Johnnie E. Frazier, Acting Inspector General, Department of Commerce) [hereinafter Frazier Testimony] (stating that post verification reviews contribute to the regulation of exported commodities by providing assurance that exporters, shippers, consignees, and end-users comply with the licensing provisions); see also S. REP. No. 106-180, at 17 (1999) (stating that post-shipment verifications are important to the United States's enforcement efforts).

289. See Gibbons Testimony, supra note 256, at 19-20 (emphasizing that the post-verification process provides marginal utility in preventing the diversion of high performance computers to countries of national security concern).

290. See THE DECISION, supra note 107, at 11 (commenting that government officials cannot determine the specific end-use of a high performance computer because the officials lack computer-specific training).

291. See Frazier Testimony, supra note 288, at 15 (discussing the implications of not involving licensing officers in the post-verification process).

292. See id.

293. See id. (pointing out that the licensing officials cannot make well-informed decisions when determining whether to issue a license because there is insufficient information
Third, Congress must provide the Department of Commerce with the means to conduct adequate verifications by funding additional investigators to conduct verification proceedings.\textsuperscript{294} Fourth, the Department of Commerce must negotiate agreements with foreign countries to permit U.S. investigators to conduct on-site inspections.\textsuperscript{295} As suggested by the Cox Committee,\textsuperscript{296} the United States should require post-shipment verifications as part of U.S. trade terms with foreign countries.\textsuperscript{297} Without country access, the post-shipment verification process is useless because U.S. investigators cannot do their jobs.\textsuperscript{298} Finally, the United States should cooperate and enter agreements with allied nations to develop joint verification efforts.\textsuperscript{299}

The implementation of these recommendations will not escape the criticism that post-shipment verifications identify illegal diversions and unauthorized uses after the fact.\textsuperscript{300} Critics must remember, however, that post-shipment verifications are only one element within the Department

\textsuperscript{294} See S. REP. NO. 106-180, at 17 (1999) (noting the inadequacy of resources available to conduct post-shipment verifications). There is currently only one investigator posted overseas. See \textit{id.} As a result, the Department of Commerce relies on foreign service nationals and personal services contractors to conduct on-site checks. See Frazier Testimony, supra note 288, at 16. Senator Gramm's Senate Bill 1712 proposes to allocate $4.5 million in additional resources to fund ten Office of Export Enforcement investigators in China, Russia, Hong Kong, India, Singapore, Egypt, Taiwan, and other posts. See S. REP. NO. 106-80, at 17.

\textsuperscript{295} See \textit{THE DECISION}, supra note 107, at 11 (explaining that countries, such as China, United Kingdom, Germany, and France have forbidden U.S. investigators from conducting post-shipment verifications). With respect to the United Kingdom, Germany, and France, these countries conduct their own verification and provide U.S. officials with the results. See \textit{id.} at 11-12. China finally agreed to allow the United States to conduct post-shipment verifications in June, 1998. See \textit{COX REPORT}, supra note 24, at 134. The People's Republic of China placed multiple conditions on the verifications thus rendering the agreement useless. See \textit{id.} at 134-35 (listing the non-classified PRC conditions of the U.S.-China agreement for post-shipment verifications).

\textsuperscript{296} The "Cox Committee," formally known as the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China, investigated China's theft of classified design information on the United States's advanced thermonuclear weapons. See \textit{COX REPORT}, supra note 24, at ii (providing the declassified version of the Cox Committee Report that encompasses the Committee's findings and recommendations with respect to the theft of United States's nuclear weapon secrets).

\textsuperscript{297} See \textit{Press Conference}, supra note 238, at 3 (statement of Rep. Christopher Cox (R-CA)) (stating that the Select Committee agreed unanimously to include an end-use verification in the terms of trade with foreign countries).

\textsuperscript{298} Cf. \textit{THE DECISION}, supra note 107, at 11.

\textsuperscript{299} See generally Cupitt Testimony, supra note 23, at 3-4 (stating that the United States should negotiate with other countries to increase enforcement efforts and to allocate additional resources to post-shipment verifications).

\textsuperscript{300} See, e.g., Gibbons Testimony, supra note 256, at 19-20 (criticizing the post-shipment verification process).
of Commerce's arsenal to prevent the diversion and unauthorized use of high performance computers. Pre-license checks of both exporters and end-users and tough penalties for export violators provide additional assurances that exporters and end-users comply with U.S. export laws. Post-shipment verifications round out U.S. export enforcement options. By strengthening post-shipment verification proceedings, the United States can continue its enforcement efforts long after the commodity leaves the U.S. borders. In addition, an effective post-shipment verification process imposes a greater responsibility on U.S. exporters in choosing its customers wisely, and ensures enforcement action should customers use or divert higher performance computers to unauthorized end-users or end-uses.305

C. Asserting U.S. Leadership to Strengthen Multilateral Controls

The final element in striking a better balance between national security and economic interests is the need for the United States to exercise its leadership in the international arena to establish effective multilateral controls on high performance computers. The dissolution of CoCom dismantled effective multilateral controls on exports. CoCom's successor, Wassenaar, is severely limited as an effective multilateral control regime because of the discretionary implementation of multilateral controls and Wassenaar's diverse membership, which includes countries such


305. See generally id. at 16.

306. See Stone, supra note 145, at 2931 (quoting Dr. Peter Leitner as stating that the United States "must take the lead in building a tougher, international export control operation"); Export Administration Act Reauthorization: Hearing Before the Senate Subcomm. on Int'l Trade and Fin. of the Comm. on Banking, Hous., and Urban Affairs, 106th Cong. (1999), available in 1999 WL 20009262, at *24 (statement of H. Seymour, President, Cincinnati Machine: A Unova Company, on Behalf of the Association for Manufacturing Technology) (calling on the Administration to strengthen the Wassenaar agreement); COX REPORT, supra note 24, at 173 (recommending that the United States assert greater leadership to assure that other computer manufacturing countries adopt export controls similar to the United States).

307. See supra notes 139-45 and accompanying text (discussing the dissolution of CoCom and effects on multilateral controls).
as Russia that pose a national security concern to the United States.\footnote{See supra notes 139-45 and accompanying text (discussing the discretionary implementation of multilateral export controls); see also Computer Tier 3, 15 C.F.R. § 740.7(d)(1) (1999) (listing Russia on the Computer Tier 3 list that includes countries of national security concern).}

Nonetheless, the United States should address these limitations by leading a multilateral effort to reinstitutionalize the "teeth" that existed under CoCom. In other words, Wassenaar should function as a review and approval regime for specified commodities listed by member nations.\footnote{See COX REPORT, supra note 24, at 12, 15 (explaining the differences between CoCom and Wassenaar with respect to the review and approval of military sensitive technology exports).} Commentators warn, however, that strengthening Wassenaar is not an easy task because of the widely divergent views on security threats.\footnote{See Hoydysh Testimony, supra note 183, at 12; see also Stokes, supra note 210, at 1475 (noting that European countries do not consider China as a security threat, but the United States does).}

As such, an alternative measure would be for the United States to enter agreements, separate and apart from Wassenaar, to establish a computer control regime similar to the Supercomputer Control Regime established in the 1980s between the United States and Japan.\footnote{Cf. COX REPORT, supra note 24, at 173 (recommending that the Executive Branch pursue agreements with other computer-producing countries to develop uniform export controls with respect to China).} An expansion of the Supercomputer Control Regime may provide a better opportunity to strike an agreement because there are far fewer high performance computer-producing countries compared to members of Wassenaar.\footnote{See Wassenaar Members, supra note 141, at 1 (noting that there are currently 33 members to Wassenaar); NATIONAL SECURITY ISSUES, supra note 110, at 4-6 (discussing the limited number of countries that are capable of producing higher performance computer technology).}

By strengthening multilateral export controls, the potential exists to enhance the United States's national security and economy.\footnote{See infra notes 314-17 and accompanying text (explaining the benefits of multilateral controls).} On one hand, multilateral controls level the playing field among competing producers of higher performance computers by eliminating advantages created by inequities in unilateral export controls.\footnote{See supra notes 217-25 and accompanying text (discussing the adverse effect of unilateral controls on U.S. producers).} U.S. producers that sacrificed their competitiveness for the sake of national security would possess the same opportunities to compete in foreign markets as their
competitors. On the other hand, multilateral controls enhance national security by restricting military sensitive technology to countries of national security concern. Absent such controls, the efforts made by individual countries to control computer technology are undermined and there is a greater risk that countries posing a national security risk will acquire military sensitive technology.

IV. CONCLUSION

The Clinton Administration's recent amendments to the Export Administration Regulations highlight the struggle among policymakers to strike the proper balance between economic and national security interests. Implicit in this balance is the need for a dynamic export control policy that is flexible enough to change with the economic, technological, and political climate of the day.

The recent regulatory changes in export law also reflect the concerns over the strength of the U.S. economy; in particular, the strength of U.S. exports in foreign markets. To address these concerns, the reforms seek to remove overly burdensome regulations that impede U.S. industries from competing with foreign producers. The Clinton Administration and Congress, however, need to take critical steps to ensure that business interests do not override national security concerns. These critical first steps should include further analysis of the military applications of high performance computers, creation of objective criteria for increasing CTP levels, enhancement of the post-verification process, and the establishment of effective multilateral export controls.

315. See supra notes 217-25 and accompanying text (noting that U.S. producers were unable to compete in foreign markets because U.S. export control laws forbid the exportation of higher performance computers to specified controlled countries).

316. See, e.g., GOODMAN ET AL., supra note 41, at 1 (commenting on the CoCom's effectiveness in preventing the acquisition of military sensitive technology by non-CoCom members).

317. See Murphy Testimony, supra note 277, at 2 (noting that unilateral export controls are ineffective); see also Stone, supra note 238, at 2931 (quoting Ashton B. Carter, a professor of science and international affairs at Harvard University's John F. Kennedy School of Government, as stating “[t]here's no point in us controlling things if our partners don't... [f]or dual-use exports, it's crucial to have international consensus”).