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*EXPORT CONTROLS: ANALYSIS OF ECONOMIC  
COSTS*

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**Abstract.** This report analyzes the economic costs to the U.S. economy of export controls on products restricted for national security or foreign policy purposes. The report describes a framework within which to judge the economy-wide impact on economic welfare of a given value of lost export sales. Both static and dynamic economic impacts are discussed. It is estimated that the economic costs of recent export control have been small. The report also discusses export control legislation now before the Congress and provides observations on its economic impact.

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## Export Controls: Analysis of Economic Costs

February 10, 2000

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# Export Controls: Analysis of Economic Costs

## Summary

The Export Administration Act (EAA) of 1979 governs the licensing for export of “dual-use” items (*i.e.* civilian goods that have a possible military application). That act expired in 1994 and continues to be enforced under national emergency authority. Many argue that a new EAA is needed, but disagree over the form revamping should take. Some see the need for substantial liberalization in the export control process to remove unnecessary burdens from American industry. Others see the need to reinvigorate the control regime to counter new and important national security threats. Unable to reconcile these opposing positions, several previous attempts to reauthorize the EAA have failed.

The national security goals of the EAA come at some economic cost. An open question is whether those costs are consistent with the national security and foreign policy benefits gained by the U.S. export control system. There may be some confusion, however, about what the magnitude of those costs is. While estimates of lost export sales are often cited as an approximation of economic costs, they may be, by themselves, an inaccurate measure of the full economic consequences of this impediment to free international exchange.

The *economic costs* of export controls to the U.S. economy is the value of lost “gains from trade” caused by the controls reducing U.S. export sales and reducing inflows of desired imports. That value will most often be a *fraction* of the value of lost export sales. It is estimated that in recent years this so-called *static loss* has been between \$500 million and \$14 billion. Some would increase the estimate of the economic cost by including possible negative effects of export controls on the U.S. rate of long-run growth. This so-called *dynamic loss* is far more uncertain, however.

Current legislative initiatives for the most part endeavor to liberalize the export control process, and remove significant impediments to U.S. exports. S. 1712, the Export Administration Act of 1999, is a comprehensive revamping of the export licensing regime. That bill places great stress on the criterion of “foreign availability” in determining what items should need an export license, with the expectation that diligent application of that criterion will greatly reduce the number of dual-use items needing an export license. S. 798 and HR. 850 deal specifically with the licensing requirements for encryption technology.

However, it remains unclear how sizable a change these legislative initiatives would make in current export control processes. Each would likely produce a moderate nudging towards more liberal controls, inducing a moderate increase in U.S. exports and an even more moderate boost to U.S. economic welfare.

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# Export Controls: Analysis of Economic Costs

## Introduction

The 106<sup>th</sup> Congress has shown interest in reforming and reestablishing the Export Administration Act (EAA) of 1979. That act expired in 1994, but continues to be implemented by executive order under national emergency authority.<sup>1</sup> Both houses have held hearings. The Senate Banking, Housing, and Urban Affairs Committee on October 8, 1999 reported a bill, S. 1712, the Export Administration Act of 1999.

In addition, legislation specifically aimed at the export of encryption technology has been reported from both the House and Senate. H.R. 850, the Security and Freedom Through Encryption (SAFE) Act, was reported by the House Judiciary committee on April 27, 1999 (H.Rept. 106-117, pt. I); Commerce on July 2 (pt. II); International Relations on July 19 (pt. III); Armed Services on July 23 (pt. IV); and Intelligence on July 25 (pt. V). S. 798, the Promote Reliable Online Transactions to Encourage Commerce and Trade (PROTECT) Act, was reported by the Senate Committee on Commerce, Science, and Transportation on Aug. 5, 1999 (S.Rept. 106-142).

Several previous attempts to reauthorize the EAA have come to naught, due, in part, to the competing interests of the two principal groups of stakeholders in the export control process. On one side are those who want to reduce the burden of the EAA on American exporting industries. On the other side are those who support more rigorous export controls on certain products to protect national security.

There is no doubt that the national security goals of the EAA come at some U.S. economic welfare loss. An open question is whether those costs are more or less than the national security and foreign policy benefits gained by the U.S. export control system. There may be some confusion, however, about what the magnitude of those costs is. Lost export sales are often cited as an approximation of economic costs. Estimates of lost sales by themselves are likely to be an inaccurate measure of the economic burden of export controls on free international exchange. There are other economic effects, both positive and negative, that must also be tallied into any estimate of economic costs.

This report provides a general framework within which to evaluate the economic costs of export controls. This framework builds on the concept of “gains from trade” and encompasses effects on both producers and consumers of changed levels of both exports and imports. In addition, an estimate of the range of probable

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<sup>1</sup> See: “Continuation of Export Controls,” Executive Order 12924, 59 Fed. Reg. 43437 (Aug. 19, 1994).

economic costs of current U.S. export controls is given. The report also attempts to judge whether current legislation would raise or lower the economic cost of export controls.

## Background

The EAA authorized the Department of Commerce to regulate the export of “dual use” items, that is, civilian goods and technology that also have the potential for military application. Currently the list of controlled items, called the commerce control list (CCL), numbers about 2,500 entries. Moreover, in recent years the Bureau of Export Administration (BXA) has processed 10,000-12,000 export license applications annually. The processing time for an export license may take several weeks, but it is often a period of several months. The time spent on acquiring an export license can be a impediment to timely marketing of products to international markets, and, therefore, a substantial competitive disadvantage, particularly if foreign producers are not similarly constrained. Of course, export controls create an effective barrier if a license is denied.

Products subject to U.S. export licensing regulations include many high-tech items, such as high-performance computers, encryption software, telecommunications equipment, precision machine tools (especially computer assisted machines), guidance technology, and synthetic materials (especially high strength and light-weight products). These are all items with which the United States likely has significant commercial advantages, but they are also items with clear military applications.

***Evolution of U.S. Export Control Policy.*** The current EAA has its roots in legislation passed in 1949 at the beginning of the Cold War. The goal at that time was to block nearly all exports to the Soviet Union, but, as the program evolved, a critical emphasis was placed on denying to the Soviets superior western technology, that effectively countered the Soviet’s numerical military superiority.

Beginning in the late 1960s, political pressure to liberalize export controls grew in response to the argument that the system needed to accommodate the growing importance of trade to the U.S. economy, including the importance of trade for sustaining the pace of domestic technological advance. Moderate liberalization of the EAA, to assuage commercial interests, continued in subsequent renewals of the act in the 1970s and 1980s.

After the collapse of the Soviet Union and the associated diminishing of its military threat to the United States, pressure grew to reduce further the burden of export controls on American international commerce. Over the course of the Bush and Clinton Administrations, the export control system has been reduced in scope and streamlined, but the basic Cold War structure remains in place. Many argue that the EAA needs to be revamped, but disagreement arises over whether the objective of reform should be to remove impediments to exports or to more effectively address important current national security threats.

The push by commercial interests for further liberalization of U.S. export controls has intensified in recent years as those controls have come to be seen as increasingly *unilateral* in nature and, in turn, increasingly unfair to American industry. The Cold War export control regime was an effective *multilateral* effort, with U.S.

allies imposing a similar high level of restrictions on “dual-use” items. That arrangement, called the Coordinating Committee on Multilateral Export Controls (COCOM), was dissolved in 1996, in part because U.S. allies no longer wanted to carry the economic burden of its trade restriction.

The successor to COCOM, the Wassenaar Arrangement, is relatively loosely structured, allowing a much wider variance between the items the United States controls and the items other members of the Wassenaar Arrangement control. More liberal export controls among U.S. allies raise the probability of “foreign availability” of some items controlled by the United States. This situation can render U.S. export controls ineffective, nullifying any benefit to national security. Also, it imposes significant added costs on affected American industries, which struggle to compete against foreign rivals that are not similarly encumbered.

On the other hand, experts point out that significant national security threats to the United States still exist. There are aggressive countries and sub-national groups that seek weapons of mass destruction to expand their influence, intimidate their neighbors, and destabilize the international environment. These new and more varied threats raise important issues relating to proliferation of items with a potential national security impact. From this viewpoint, the current export control process is already too porous, and further liberalization would only exacerbate the threat to national security. Some believe the system needs to be reformed to make controls more effective, not more liberal. In addition, it is argued that the often unilateral nature of many U.S. controls is a necessary aspect of a process, with the United States assuming a leadership position of moving other countries, by negotiation, toward the multilateral export controls needed to achieve important national security goals.

Failure to agree on how the EAA should be revamped has meant that attempts at reauthorizing the lapsed act have failed repeatedly over the last seven years. In the 104<sup>th</sup> Congress, H.R. 361, the Omnibus Export Administration Act of 1996 was generally seen to represent a liberalization of U.S. export controls, preferring export controls in compliance with multilateral regimes and establishing strict conditions on the use of unilateral export controls, forcing stricter adherence to true multilateral efforts and mandating stricter rules for imposing unilateral controls. H.R. 361 was passed by the House in July of 1996 and referred to the Senate. The Senate Banking Committee held hearings, but no further action was taken.<sup>2</sup>

## **The Economic Cost of Export Controls**

The argument is made that the U.S. economy is damaged by export controls that cause U.S. high-tech companies, farmers, and others to lose overseas sales. The economy suffers a loss of global competitiveness, decreased ability to develop new products and services, and the loss of profits and jobs.

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<sup>2</sup> For a discussion of the U.S. export control process and legislative efforts to revamp that program see: U.S. Library of Congress, Congressional Research Service. Export Administration Act of 1979 Reauthorization. CRS Report RL30169 by Helit Barel, Robert Shuey, Craig Elwell, and Jeanne Grimmer.

While export controls have some impact on the economy, the effect may be somewhat overstated by affected groups. This section of the report outlines a framework for evaluating the economic costs of export controls.

**Static Losses.** Trade occurs because it is mutually enriching, raising economic efficiency and allowing trading economies to reach a higher level of output and consumption from an unchanged endowment of scarce productive resources. This benefit is called the “gains from trade.” These gains arise from trade giving an economy increased scope for specialization in the production of goods for which the economy has a relative efficiency advantage, and from improved ability to trade for those goods for which an economy has a relative efficiency disadvantage. Exports are the vehicle for acquiring desired imports and are central to the enriching process of trade. Therefore, one would expect that export controls, by impeding exporting, to reduce trade, result in a less efficient allocation of a nation’s productive resources, and cause a decrease in a nation’s gains from trade.

The economic cost of export controls is often expressed as the estimated value of lost export sales. Such a measure may be a good indicator of the cost to a particular industry or sector. By itself it is a measure that, while being an element entering into a calculation of economy-wide cost, likely overstates the true economic cost of this trade impediment.<sup>3</sup> Standard economic analysis indicates that the total economic loss associated with imposing export controls would be the *net* outcome of several opposite effects. These effects can be positive or negative, depending on whether one is a producer or consumer and whether one’s economic circumstances are linked to exports or imports.

Consider first the direct effects of reducing exports. One obvious effect is an unfavorable impact on domestic producers who export. This occurs because producers are unable to sell as much of the controlled good as an export at the more favorable world price and must settle for the lower domestic price. Lower product prices reduce the economic welfare of domestic producers. There is, however, a favorable economic effect on domestic consumers. This arises because the formerly exported goods, and the resources that produce them, are not lost to the economy, but are absorbed into the domestic economy via a fall in prices. Lower product prices improve the economic welfare of domestic consumers of the exported product. In most circumstances the strong expectation is that the loss to domestic producers of exports will exceed the gain to domestic consumers of the exported good, leading to a “net” economic loss for the whole economy directly attributable to diminished export sales.

This is only half the story, however. The nature of trade is the exchange of exports for imports. If exports are reduced, then, ultimately, so must the imports that they are traded for. This induced reduction of imports will also have positive and negative impacts on economic welfare. Domestic producers, who compete against imports, will see their sales and economic well-being rise. Consumers of imports, on the other hand, are made worse off as their opportunities to buy the preferred lower-price foreign goods are reduced. In this case, the strong expectation is that the

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<sup>3</sup> For a fuller discussion of the economic case for and against free trade, see: U.S. Library of Congress. Congressional Research Service. Trade, Trade Barriers, and Trade Deficits: Implications for Economic Well-Being. CRS Report RL30226 by Craig Elwell.



economic loss to domestic consumers of imports will exceed the economic gain of producers of import-competing goods, leading to a net loss to the economy directly attributable to reduced imports.

The combined effect of a net loss from diminished exports and a net loss from diminished imports must be an unambiguous economic loss to the overall economy. This is a logical outcome, for if trade is reduced, the "gains from trade" are also reduced and national economic welfare will be smaller than it would be without export controls. This total loss, however, is likely to be a *fraction* of the initial reduction of export sales, because the resources that produced those exports are not lost to the economy. They are used less efficiently, but can still be used to produce other exports or other import-competing goods that improve economic well-being.

This less efficient allocation of economic resources and associated reduction of the gains from trade, induced by an impediment to exporting, leads to a onetime reduction of national income. This lowering of national income is called a *static loss* and is the standard measure of the economic costs to the economy of a trade barrier.

***Estimating the Economic Costs of the EAA.*** The analytical framework outlined above suggests, however, that while reduced export sales are the initial effect of export controls, the ultimate cost (*i.e.*, static loss) to the U.S. economy from export controls is likely to be a *fraction* of the value of lost export sales. The size of this fraction is a function of the relative changes in producer and consumer gains and losses which, in turn, are determined by the underlying characteristics of demand and supply in the markets affected.

Evidence from other trade liberalization or trade restriction initiatives can suggest the probable range within which the EAA's impact lies.<sup>4</sup> These studies show that multilateral policies, which affect many economic sectors and many trading partners have typically had the largest impact on economic well-being, with the national income changing as much as 35% of a given dollar change in the value of exports. A smaller welfare effect on economic well-being is found for unilateral policies that work across a narrower spectrum of trading partners, typically generating welfare changes of between 10% to 20% of the associated change in export sales. At the low end, one recent study of a variety of unilateral economic sanctions against a few small economies found that the U.S. welfare loss was only about 5% of lost export sales.

It seems unlikely that the affect of export controls on U.S. economic well-being is most similar to that of a large multilateral trade policy, but neither is it clear that they would be more like unilateral export sanctions. Absent more direct evidence, a reasonable conjecture about the static welfare loss to the U.S. economy caused by U. S. export controls would be a loss of 5% - 35% of the value of lost export sales, with the more probable effect in the middle of that range rather than at the extremes.

To estimate the dollar value of the welfare loss associated with export controls would also require an estimate of the magnitude of lost export sales caused by that

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<sup>4</sup> The welfare effects of selected trade policies are summarized in: U.S. Congress. Congressional Budget Office. *The Domestic Costs of Sanctions on Foreign Commerce*. Washington DC. 1999. Pp. 77-83.

policy. A study done in 1995 judged that export controls could have caused as little as \$10 billion or as much as \$40 billion in forgone export sales, but the greatest probability was attached to a central range of \$21 to \$27 billion.<sup>5</sup> (To help judge the relative magnitude of this estimated effect, in 1995 total U.S. exports were valued at \$819 billion.)

Combining these two sets of data gives an estimated range for the static economic welfare loss of U.S. export controls. That range would extend from a low of \$500 million (0.05 x \$10 billion) to a high of \$14 billion (0.35 x \$40 billion), but with the greatest probability attached to a central range of about \$2 billion (0.10 x \$20 billion) to \$4 billion (0.15 x \$27 billion). It may help to put these loss estimates into perspective if one considers them in relation to GDP. In 1995 U.S. GDP was valued at \$7,269 billion, putting the estimated static economic losses(costs) of export controls in a range from 0.007% to 0.2% percent of U.S. GDP.

**Dynamic Losses.** Some economists argue that, in addition to the loss of static gains from trade, one should add in the loss of *dynamic* gains from trade caused by export controls. In general, dynamic losses could result from a trade barrier causing a *sustained reduction* of the economy's *long-run rate* of economic growth. Because a change in the growth rate has a *cumulative effect* on national income (in contrast to the one-time impact of a static loss), dynamic effects could, with only a small annual decrement to the long-run growth rate, add up to a very large long-run loss. If present, dynamic losses, perhaps many fold the size of associated static losses, could raise substantially the total domestic economic costs of U.S. export controls.

In general, proponents of the existence of dynamic impacts argue that impediments to trade cause a degrading of the environment for investment and innovation in exporting industries. This eroding of economic incentives would likely be particularly important for firms at the technological forefront, whose success may be tied to capturing large global markets to help spread the costs of enormous R&D budgets and to generate more opportunities for realizing productivity gains through "learning by doing." More specifically, these are the types of firms whose products carry a significant "dual-use" potential, and would likely be significantly affected by U.S. export control policies.

The existence and size of such dynamic effects, however, are more *uncertain* than the existence of static efficiency effects. Mainstream models of economic growth suggest that the engine of long-run economic growth is the pace of improvement in technical knowledge and that such improvement moves at a speed and with a caprice that is substantially unrelated to economic policies. Despite changes in a variety of economic policies, including trade policies, the trend growth rate for the U.S. economy has shown little variation over the last 125 years, with GDP per capita rising at a very steady trend of 1.8% per year. Trade restrictions and other policies can lower the level of income, but, according to mainstream economic models, they do not permanently change the rate of long-run growth.

The empirical literature on the trade and growth linkage should be interpreted cautiously. Many studies have found there to be a relation. But, others have offered

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<sup>5</sup> See: Richardson, J. David. *Sizing Up U.S. Export Disincentives*. Washington DC: Institute for International Economics. pp. 127-131.

good reasons to think that the relationship may not be particularly robust. In light of all of this, reliance on projected economic losses derived from a trade barrier's possible *dynamic* effects may risk overstatement.<sup>6</sup>

**Sectoral Costs.** As suggested above, the direct cost of export controls to particular firms, industries, and sectors is larger than the net cost to the overall economy. The open and flexible nature of the U.S. economy helps to minimize such costs, although, significant burdens may still remain. Estimates of lost export sales are relevant to an evaluation of the U.S. export control regime. Lost sales provide some insight into possible adjustment costs and other social costs associated with export controls. They may also become useful in any discussion of equity of burden. In theory, the federal government can provide compensation to ameliorate the domestic burden of export controls.

## Economic Impact of Pending Export Control Legislation

This section provides a summary of current bills aimed at revamping U.S. export control law as well as an observation about of each bill's likely economic impact.

### The Senate.

**S. 1712, the Export Administration Act of 1999.** As reported by the Senate Banking Committee, this bill attempts to strike a new balance in the U.S. export control regime between national security and commercial concerns. S. 1712 would focus controls on current threats to national security, such as terrorism and proliferation of weapons of mass destruction, rather than on the former threat of communism.

This bill would seek to reduce the items that could be controlled for national security purposes; items that are available from foreign sources or have a mass-market status would generally not be controlled. The bill charges the Secretary of Commerce with determining on a continuing basis whether any item currently subject to export control meets specified criteria for foreign availability or mass market status. If it does, the item would be removed from the list of controlled items.

S.1712 would also place several requirements and prohibitions on the use of export controls for foreign policy purposes. These include prohibiting the control of re-exports, prohibiting the control of items subject to a binding contract, requiring 45 days notice and consultation before imposing a control, requiring clearly stated objectives and criteria for controls and reporting them to Congress, and requiring the President to review controls every two years. The bill also streamlines the process by which regulations for the export of super computers are periodically updated.

It is possible that a more vigorous pursuit of "foreign availability" status will reduce the number of items on the CCL. It remains unclear, however, how significantly this bill would upgrade and expand, relative to current provisions, the use of the "foreign availability" criterion for national security purposes. Controls for

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<sup>6</sup> For a fuller discussion of the possible linkage between trade and growth see: U.S. Library of Congress. Congressional Research Service. Does Trade Liberalization Affect the U.S. Long-run Rate of Growth?. CRS Report RL30377 by Craig K. Elwell

foreign policy purposes, under *current* regulations, must satisfy explicit criteria, relating to probable impact and prospect for success, before they are imposed. It is unclear how much this appreciably raises the threshold for requiring an export licence.

S.1712 would likely move toward continued liberalization of export controls. If the provisions of the bill have a differential impact relative to current rules, it would likely be to reduce the number of items subject to U.S. export controls, increase U.S. exports, and raise national income (by a fraction of the value of those increased sales). But, the magnitude of these effects is problematic.

***S. 798, the Promote Reliable On-line Transactions to Encourage Commerce and Trade (PROTECT) Act.*** As reported by the Senate Commerce Committee S. 798 authorizes the export without export license of any encryption product that utilizes a key length of 64 bits or less. Provision is also made for a periodic review and update of the 64-bit standard so it can change in step with technological advances. For encryption products that require a standard license, the bill provides easier conditions for exporting due to a streamlining of the license application process, including, an expanded scope for granting license exceptions (*i.e.*, exporting without a license), one-time technical review, and a short 15-day license processing period.

This bill is a significant liberalization of export controls over a subgroup of controlled items. It would likely expand U.S. export sales and raise national income by a fraction of the export sales increase. From the standpoint of the national economy, the magnitude of these economic effects would likely be modest.

#### **The House.**

***H.R. 850, the Security and Freedom Through Encryption (SAFE) Act.*** The five reported versions of H.R. 850 differ in their treatment of export controls on encryption products. As initially reported out of the Judiciary Committee, this bill would have limited greatly the President's authority to control the export of encryption products. In that version of the bill, encryption products with a key length of 64 bits or less would be subject to more liberal treatment by export control authorities. These products would be eligible for an export license exception subject to a one-time technical review, with the whole application process to be completed within 45 days. Export license exceptions would be available for encryption products that exceed the 64-bit standard, subject to national security goals. (Versions of H.R. 850 reported by the Commerce and International Relations Committees are similar to Judiciary's version.) In contrast, the Intelligence and Armed Services Committees' versions of H.R. 850 would not explicitly move toward more liberal export controls on encryption products. Those versions increase presidential authority by allowing the executive to specify the key length that would be the threshold for waiving export controls. Products at or below that key length would be eligible for a license exception, subject to a one-time technical review. Encryption products above the threshold key length would be subject to normal EAA export license requirements.

The House Judiciary Committee version of H.R. 850 would liberalize U.S. export controls on encryption products, raising exports and national income. From the standpoint of the national economy, the magnitude of these economic effects would likely be small. The economic impact of the Armed Services and Intelligence

Committees' versions of H.R. 850, that do not expressly liberalize or tighten encryption export controls, would depend on rule changes implemented at the discretion of the President.

***Administration Actions.*** On Sept. 16, 1999, the Administration announced further liberalization of export controls on encryption products. Encryption products of any length can now be exported under a license exception after a technical review. Export of any product with a key length of more than 64 bits requires post-export reporting, however. The prior policy had been to allow export only of encryption devices with up to 56-bit keys under a license exception after a one-time technical review.

## **Conclusion**

The estimates presented above suggest that the economic costs (*i.e.*, static losses) of current export control regulations are modest in relation to the overall economy. Nevertheless, the full significance of that cost, however small the absolute value, must be assessed relative to the national security and foreign policy benefits derived from those controls. The benefit of U.S. export controls remains a sharply contested issue and must be evaluated on more grounds than economics.

Pending legislation on export controls generally takes the perspective that controls are too restrictive on U.S. international commerce, and aim to liberalize the export control process. That legislation, if enacted, does not seem likely to cause a great deviation from current export control administration, however. That would suggest that the increase in U.S. exports and improvement of domestic economic well-being derived from the legislation would be small in magnitude.