ITA - 2: The Case for IT Liberalization

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Executive Summary

In December 1996, representatives from twenty-eight countries announced an agreement to eliminate tariffs on specified information technology (IT) products by the year 2000. However, the momentum toward an expanded Information Technology Agreement (ITA-2) has slowed considerably. Negotiations seem destined to go the way of the early, voluntary sectoral liberalization process, which stalled and was rolled up into the upcoming multilateral round of negotiations.

The Economic Strategy Institute (ESI) has examined arguments for and against expanding the ITA. The main points of ESI’s analysis are shown below.

Assessing the Arguments against ITA Expansion

The arguments against ITA-2 (shown below in italics) are not well conceived:

- **IT sectors are “infant” industries that should be nurtured with subsidies and protection.**
  
  Though infant-industry strategies were utilized successfully by many countries to nurture competitive industrial sectors, they will probably prove less successful in capturing the full range of advantages afforded by information technology. In fact, industrial policies are more likely to hinder the very IT sector they are supposed to promote.

- **An ITA would reduce tariff revenue, thereby aggravating budget deficits in many countries.**
  
  Another round of IT liberalization would indeed result in lower duty collection, but this is hardly cause for avoiding an expanded ITA. The higher tax revenues resulting from an expanding IT sector will likely far exceed any revenue losses due to tariff reductions. As the U.S. experience demonstrates, if budget deficits are of concern to governments, promoting economic growth would be a much more effective solution than maintaining high import taxes.
There is no need for another ITA, because one is already in place. Despite ITA-1, there are still pockets of tariffs ranging from 15 to 50 percent on some products. Just as important as the need to lower existing tariffs is the need to ensure that the IT products of tomorrow also receive zero-tariff treatment. The impulse to stop at ITA-1 ignores the 50-year precedent of the GATT’s eight rounds of multilateral negotiations. Postwar trade liberalization has always been a dynamic process. The ITA process must also be a continuing one.

Signing an ITA now would reduce bargaining leverage in the upcoming round of multilateral trade negotiations.

The argument against sectoral agreements has always been that they are pushed by countries that hold a comparative advantage in the promoted sector. However, the countries taking part in the ITA process are the major producers and traders of the products and services under discussion, and every country at the table has something to gain from further market opening. If negotiators fold ITA-2 into the upcoming comprehensive round, they will ensure less IT liberalization and accentuate the impression, left by the stall in the early, sectoral, voluntary liberalization process, that market opening is no longer important.

The Case for Trade Liberalization

In stark contrast to the weak arguments against expanding the ITA is the mountain of evidence showing that further market opening in IT sectors will produce outsized economic gains.

From a theoretical perspective, the benefits of reducing trade barriers such as tariffs and quotas are crystal clear. Trade enables all countries to gain through exchange and specialization. Several studies have shown that the Uruguay Round will result in an increase of up to one percent in global income, which translates into an additional $200-$500 billion. Income gains from liberalization (when expressed as a percent change from current levels) are larger for developing countries than for advanced ones.

The actual gains from trade liberalization are likely larger than these estimates imply. The comparative static models used to derive these estimates do not measure the dynamic gains that can persist even after the initial spurt in growth.
The superior export and growth performance in Asia, compared to that of Africa and Latin America, and a host of empirical studies, suggest a strong link between open markets and economic performance. Studies have found that: (1) technology embodied in imports positively affects domestic productivity, (2) countries that trade more invest more, (3) growth is reduced by trade barriers and other market distortions, and (4) open economies are converging at higher income levels than closed economies.
The waves of tariff reductions that occurred under the auspices of the GATT facilitated structural changes that remade many developing economies. Countries that did not fully take advantage of trade opportunities experienced slower economic growth and now find themselves with outdated manufacturing technology or, worse, still dependent on the production and export of a handful of commodities. Likewise, countries that lag in adopting IT products and services and are slow to adapt to the requirements of the information age risk falling behind.

**The U.S. Experience**

The performance of the IT-intensive U.S. economy is perhaps the best argument for further reducing trade barriers on IT products. The benefits of IT are affecting firms, workers, and consumers in many positive ways. Real output has grown faster and longer than many believed possible, productivity is improving, and inflation remains low.
Exhibit ES.3: IT-Producing Industries' Contribution to U.S. Economic Growth.

*1997 and 1998 data are estimates
Source: U.S. Bureau of Economic Analysis appearing in The Emerging Digital Economy II.

The statistics make clear that the benefits of IT stem from both the production and use of IT products and services. Both producers and users of IT have higher-than-average wages and have been adding employees. Productivity gains have been spectacular for IT producers, and many heavy users of IT, especially manufacturers, have also achieved major gains.
Trade has been a major contributor to this story. Imports and productivity gains have kept the cost of IT products and overall inflation low. Rising exports and rising production have yielded disproportionately large gains to real GDP. The expansion of exports and imports is being facilitated by reduced trade barriers at home and abroad. Competition from imports is helping to keep domestic prices low and is thereby increasing the speed with which IT penetration takes place.

**Conclusion**

When the first ITA was negotiated, the vast potential of information technology was largely an article of faith. There was little data to buttress the claim that free trade in IT products and services is an important enabler of technological diffusion and economic progress. Despite the lack of proof, negotiators took the plunge anyway.

Today, there is a growing body of evidence that the production and use of IT goods and services can have outsized economic benefits and that market opening in the IT sector can help countries obtain these benefits more quickly.
Armed with these facts, negotiators from the world’s IT producers have all the information they need to do the right thing: commit themselves to reinvigorating the ITA process and completing an agreement before the Seattle WTO ministerial meeting begins in November.
Chapter 1: 

Introduction

On December 13, 1996, representatives from twenty-eight countries announced an agreement to eliminate tariffs on specified information technology (IT) products by the year 2000. That Information Technology Agreement (ITA), which went into effect on April 1, 1997, was ultimately accepted by more than forty countries accounting for more than 90 percent of trade in products at the core of the emerging digital economy, such as semiconductors and telecommunications equipment.

The accord was groundbreaking from the standpoint of the multilateral trading system. Participating countries were able to conclude the agreement outside the framework of a comprehensive round of negotiations. In addition, the ITA negotiations focused on only one sector. The typical multilateral round covers many sectors and proceeds with countries making tariff concessions in certain sectors in exchange for concessions by other countries in different sectors.

The experience of the first ITA (ITA-1) made it clear that a continuous process was needed to keep up with the rapid technological change. Hence, it was agreed to pursue an expanded ITA (ITA-2) that would: (1) cover products not included in ITA-1, and (2) attempt to tackle non-tariff barriers that in many cases are onerous enough to limit the impact of tariff reductions.

Extending ITA-1 seemed to be a constructive next step. The rationale underlying ITA-1 — reducing tariffs to make the benefits of the global information infrastructure available at the lowest possible cost — is even more valid now than it was in 1996. Trade in information technology products now totals $600 billion, more than 10 percent of total merchandise trade. The digital economy, which relies on the production and use of IT products made all over the world, is spreading faster than many of its proponents thought possible, and is becoming a driver of growth and productivity enhancement. Higher prices, resulting from tariff and non-tariff barriers, risk hurting not only the IT producing companies
but also the consumers and IT-using industries that will have to pay more and wait longer to participate in the revolution empowered by IT products and services.

Much has happened between December 1996 and today, however, and the movement toward an expanded ITA has slowed to a snail’s pace. In large measure, the stalled negotiations are a byproduct of the Asian financial crisis, which severely damaged the economies of major Asian producers of IT goods. Because the large trade deficits of many Asian countries were a precipitating factor in the crisis, there has been a palpable cooling in the region toward trade liberalization.

This increased wariness toward market opening was partly responsible for the difficulties that hindered the early, voluntary, sectoral liberalization (EVSL) negotiations among members of the Asia-Pacific Economic Cooperation forum in 1998. Slower economic growth in Asia and, to some extent, in Europe, has created budget pressures that have made governments reluctant to eliminate potential sources of revenue, including tariffs. Despite the role that market distortions played in precipitating the Asian financial crisis, many countries continue to believe that trade-distorting industrial policies are needed to develop national IT industries. With the momentum toward ITA expansion faltering, IT liberalization seems destined to go the way of the EVSL program.

Allowing that to happen would be a terrible and expensive mistake that ignores the lessons of the past fifty years. The Economic Strategy Institute (ESI) has examined those lessons and concluded that failure to embrace an ITA expansion would have two major costs. First, countries would forego the gains from trade predicted by traditional welfare analysis. Second, countries would also forego the additional gains that would accrue from a rapid diffusion of information technology. Rejecting ITA-2 would hinder job creation, crimp corporate profits and, ultimately, sacrifice future growth. ITA-2 still makes sense. Countries need only to focus on the big picture.
Chapter 2: Debunking Arguments against ITA-2

Despite the compelling benefits that continued ITA liberalization would provide, momentum toward another agreement is fading. Though the Asian financial crisis has clearly made many countries hesitant about further liberalization, other factors are also at work. In particular, several countries are convinced by one or more of the following arguments:

- IT sectors are “infant” industries that should be nurtured with subsidies and protection.
- An ITA would reduce tariff revenue, thereby aggravating budget deficits in many countries.
- There is no need for another ITA, because one is already in place.
- Signing an ITA now would reduce bargaining leverage in the upcoming round of multilateral trade negotiations.

On closer inspection, none of these arguments passes muster. Neither the desire to nurture IT-producing sectors, the prospect of increased tariff revenues, nor strategic bargaining considerations are sufficient reasons for sacrificing the broad-based gains that an expanded ITA would bring.

Though infant-industry strategies were utilized successfully by many countries to nurture competitive industrial sectors, they will probably prove less successful in capturing the full range of advantages afforded by information technology. As later chapters make clear, though the benefits of greater IT production are substantial, the gains from using IT, in terms of job creation, consumer choice, and corporate efficiency, are also sizable. Just as important, the rapid change that is a hallmark of the emerging digital economy makes targeted industrial policies even riskier. In an environment where today’s leader can become tomorrow’s laggard, large-scale industrial policies are more likely to become expensive failures than were their predecessors of the 1960s, 1970s, and 1980s. Though private firms can err just as spectacularly as
governments, the ability of firms to respond more quickly to changing market forces makes such failures less likely.

Moreover, industrial policies are more likely to hinder the very IT sector they are supposed to promote. As Michael Borrus and Stephen S. Cohen noted in a recent study:

Tariffs and other trade restrictions are incompatible with the new competitive dynamics for IT. Countries that continue to pursue policies of promoting "national champions" behind protected national boundaries will experience slower growth of IT activities while their domestic IT industries will be technological laggards compared to competitive IT industries operating in open markets.

Infant-industry strategies that rely on tariffs can also lead to underground imports, as buyers look to avoid duties. Ironically, the development of such gray-or-black-market imports could cost the government money and reduce technological diffusion. Because smuggled products are not sold through normal sales channels, governments forego the opportunity to collect sales or other taxes associated with the gray-market transfer. Worse, technology transfer, an important goal of industrial policy, is hindered because gray-market sales often occur without interaction between the engineers of the supplier and consuming firms, contact that facilitates the process of technology transfer.

If governments decide the IT sector is a priority, they would be better off following policies that support increased IT usage, rather than following targeted, market-distorting industrial policies aimed at producers. Appropriate policies include changing educational curricula to reflect the growing importance of IT, funding university research and supporting partnerships between universities and firms, and developing the communications infrastructure to increase consumer access. The lack of infrastructure is an enormous barrier to IT usage in many developing countries. In Mexico, for example, telephone penetration is only 24 percent, and one-third of available lines are dedicated to business use. Unless such limitations are addressed, developing countries will fail to
capitalize on the information age, even if targeted industrial policies succeed in raising production levels.

Another round of IT liberalization would indeed result in lower duty collection, but this is hardly cause for avoiding an expanded ITA. As the U.S. experience shows, the best tonic for a budget deficit is a vibrant domestic economy. Though budget discipline was in part responsible for the elimination of the mammoth U.S. federal deficit, the tax revenue generated by the recent expansion was also important. In fact, the higher tax revenues that accompany economic growth will likely far exceed any revenue losses due to tariff reductions.

Look at the United States. In 1995, nominal U.S. gross domestic income expanded by $361 billion, and federal receipts grew by $93 billion. That is, each dollar increase in output led to a 26 cent increase in federal revenues. That same year, value added by IT producers expanded by $51 billion. Assuming that IT profits and wages are taxed at the same rate as non-IT profits and wages, that incremental output generated about $13 billion in additional tax inflows. On the other hand, The Commerce Department estimates that U.S. imports of IT products in 1995 were $150 billion. If the average tariff rate for IT imports were 4 percent, $6 billion in duties would have been collected. Thus, under these assumptions, eliminating IT tariffs completely would have cost the U.S. Treasury $6 billion, but this loss would have been more than covered by the revenues generated by the IT sector. Moreover, lower tariffs on U.S. exports would have led to more overseas sales and, consequently, additional U.S. tax revenues. On a net basis, the U.S. Treasury would have still been ahead of the game.

These rough estimates are only illustrative. Obviously, ITA tariff reductions are phased in over a number of years, so the decline in tax revenue would be much more gradual. But the point is still valid. The lost revenues due to tariff elimination are minimal when compared to the copious revenues generated by growing IT sectors. If budget deficits are of concern to governments, promoting economic growth would be a much more effective solution than raising import taxes.
Critics who argue that the existence of ITA-1 obviates the need for ITA-2 are ignoring substantial evidence to the contrary. ITA-1 did reduce tariffs on the bulk of IT products, but there is still much more work to be done. Though less widespread than before ITA-1, high tariffs remain. According to a recent study by the U.S. International Trade Commission, there are still pockets of tariffs ranging from 15 to 50 percent on some products.

Just as important as the need to lower existing tariffs is the need to ensure that the IT products of tomorrow also receive zero-tariff treatment. As new products are developed, they must be classified by national authorities who in the past have been known to base classification decisions on revenue generating potential rather than product characteristics. The frequent modifications of the harmonized tariff system (HS) can also affect the tariff levels of IT products. The potential for reemerging trade distortion was foreseen by signatories of ITA-1, who agreed to meet periodically to review product coverage and determine whether it should be modified to incorporate other products. In other words, it was clear from the start that ITA-1 was the first step in a continuing process. With technology changing so rapidly and tariff reduction opportunities still present, a one-shot deal makes very little sense.

The argument for a terminal ITA process is even more bizarre when one considers the history of multilateral trade negotiations. There have been, after all, eight rounds of negotiations to reduce trade barriers. Each of these rounds reduced tariffs further than its predecessor and/or dealt with issues that the previous round left unresolved. Where would we be if negotiators stopped after just one round? Postwar trade liberalization has always been a dynamic process. Given the special characteristics of IT products and the potentially substantial gains from further IT liberalization, the ITA process must also be a continuing one.

The fourth argument against concluding another ITA – that an agreement would reduce bargaining leverage in the upcoming WTO round – does not make much sense either. The argument against sectoral agreements has always been that they are pushed by countries that hold a comparative advantage in the promoted sector. If that is truly the case, it might make sense for certain countries to make tradeoffs in a multilateral
environment. But the countries taking part in the ITA process account for more than 90 percent of global trade in the sector. They are the major producers and traders of the products and services under discussion, so the sector is important to them too, not just to one or two countries. No one country is the dominant exporter across all IT product categories. Quite the opposite, the United States, often alleged to be the 900-pound gorilla in IT export markets, ran an IT merchandise trade deficit of $55 billion in 1998. Clearly, every country at the table has something to gain from opening IT markets further.

Pushing negotiations back to the WTO framework is a bad idea for two other reasons. First, the comprehensive negotiating framework cannot possibly produce as much IT liberalization as a sectoral approach, because negotiators will be compelled to seek tradeoffs across a range of items. Hence, the penetration of IT products and services, and the substantial benefits they embody, will occur more slowly, to the detriment of businesses and consumers around the world. Second, the failure to conclude ITA-2 will only accentuate the impression, left by the stalled ESVL negotiations, that market opening is no longer important. That is hardly an uplifting way to begin the upcoming round of WTO negotiations. Would it not be better to come into the negotiations on a high note?

In contrast to the weak arguments being advanced to oppose ITA-2, a growing mountain of evidence demonstrates that market opening, particularly in IT products, can improve economic performance. The link between trade, growth, and the IT sector is explored further in the next two chapters.
Chapter 3:
The Case for ITA-2 – Theoretical Considerations

Static Gains from Trade

If members of the World Trade Organization (WTO) have learned anything during the past five decades, they have learned that reducing trade barriers enhances economic welfare. From a theoretical perspective, the benefits of reducing trade barriers such as tariffs and quotas are crystal clear. Trade enables all countries to gain through exchange and specialization. Gains from exchange occur when a country exports one good (or service) in order to import another that is more desirable. Gains from specialization arise because countries are able to produce more of what they produce best. Thus, from a global standpoint, production with trade exceeds production without trade. Each individual country can also profit from trade, even countries that are less efficient across the whole range of economic activities.

The graph below illustrates, from a global perspective, the static gains in the market for any given product (see Exhibit 1). With an average tariff equivalent to $P_D - P_S$, quantity $Q_t$ is consumed at price $P_D$. With global trade barriers removed, quantity $Q^*$ is produced and consumed at price $P^*$. Tariff revenue is reduced by the amount bound by rectangle $P_DabP_S$ and this revenue is transferred to producers and consumers. Triangle abc represents an efficiency gain, which occurs because the free-market price enables both the production and consumption of the additional quantity $Q^* - Q_t$. Overall, producers and consumers are better off, and the income gains that accompany increased production lead to increased saving and investment, and therefore, growth in the global economy.
Many scholars have attempted to quantify the gains from trade liberalization using a variety of techniques and assumptions. For example, several studies have tried measuring the impact of Uruguay Round tariff reductions on global, regional, and national income levels. According to those studies, the Round, when fully implemented, will result in an increase of up to one percent in global income (see Exhibit 2). That translates into an additional $200-$500 billion in income. Those income gains are consistent with the OECD’s recent estimate that market opening in the round resulted in a worldwide tax cut of $200 billion per year.
Exhibit 3.2: Global Income Gains from the Uruguay Round, Percent, according to Various Studies.

<table>
<thead>
<tr>
<th>Study/model</th>
<th>Sectors liberalized</th>
<th>Predicted Global Income Gains</th>
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<tbody>
<tr>
<td>Francois, McDonald and Nordstrom (1996)</td>
<td>Manufacturing, Agriculture</td>
<td>0.2 to 1.0</td>
</tr>
<tr>
<td>Harrison, Rutherford and Tarr (1996); (World Bank Model)</td>
<td>Manufacturing, Agriculture</td>
<td>0.4 to 0.7</td>
</tr>
<tr>
<td>Hertel, Martin, Yanagishima and Dimaran (1995); (GTAP model)</td>
<td>Manufacturing, Agriculture</td>
<td>0.9</td>
</tr>
<tr>
<td>Haaland and Tollesen (1994)</td>
<td>Manufacturing, Services</td>
<td>0.2</td>
</tr>
<tr>
<td>Nguyen, Perroni and Wigle (1993)</td>
<td>Manufacturing, Agriculture and Services</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Source: World Trade Organization

It is also noteworthy that studies compiled by the WTO show that the income gains from liberalization (when expressed as a percent change from current levels) are larger for developing countries than for advanced countries.
### Exhibit 3.3: Estimated U.S. and Developing-Country Income Gains from the Uruguay Round, Percent.

<table>
<thead>
<tr>
<th>Study/Model</th>
<th>Sectors Liberalized</th>
<th>Predicted Income Gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown, Deardorff, Fox and Stern (1995)</td>
<td>Manufacturing (tariffs only)</td>
<td>USA: 0.6 to 0.9, Asian NICs: 2.4 to 3.6, Mexico: 0.1 to 2.8</td>
</tr>
<tr>
<td>Francois, McDonald and Nordstrom (1996)</td>
<td>Manufacturing, Agriculture</td>
<td>USA: 0.6, China: 4.0, East Asia: 3.2, South Asia: 3.1, Latin America: 1.7, Africa: 1.4, Transition: 0.4</td>
</tr>
<tr>
<td>Harrison, Rutherford and Tarr (1996)</td>
<td>Manufacturing, Agriculture</td>
<td>USA: 0.5, China: 0.5, Latin America: 1.7, East Asia: 3.1, MEast/NAfrica: 1.7, Sub-Saharan Africa: 2.0, Transition: 0.1</td>
</tr>
<tr>
<td>Hertel, Martin, Yanagishima and Dimaranan (1995)</td>
<td>Manufacturing, Agriculture</td>
<td>US and Canada: 0.4, NICs: 3.8, China: 1.5, Indonesia: 2.9, Malaysia: 21.5, Philippines: 6.6, Thailand: 4.5, South Asia: 1.9, Latin America: -0.1, Sub-Saharan Africa: -0.5</td>
</tr>
</tbody>
</table>

Source: World Trade Organization
Dynamic Gains from Trade

It is also possible that the income gains associated with market opening are even larger than those measured by the above, comparative static models. The main criticism of those models is that they do not capture the dynamic gains from trade, such as the impact, over time, of “learning by doing,” or the increased research and development that rising trade levels can stimulate. Though growth rises to a higher plane in the aftermath of liberalization, the growth rate does not increase in the comparative static framework. Many economists believe that dynamic gains from trade can persist even after the initial spurt in growth, thereby leading to a higher growth rate (see Exhibit 4). Research in this area is still in its infancy, but early results imply that the welfare gains from liberalization are dramatically higher if the dynamic gains from trade are accounted for.

Exhibit 3.4: The Impact of Liberalization – The Comparative Static Model versus the Dynamic Approach.
Evidence of the Links between Trade and Growth

Statistics comparing trade and growth levels, as well as studies comparing trade openness and growth levels, suggest a strong link between trade openness and growth. Exports have become an increasing share of output, and economies that have increased their global export shares have performed better than economies with declining export shares. From 1948 to 1997, real global merchandise exports grew 6 percent annually, while real global output expanded only 3.7 percent per annum. Over the past thirty years, real trade expanded 470 percent, about two-and-a-half times more than real output¹ (see Exhibit 5).

Asia’s share of world trade has increased from 15 percent in 1948 to 27 percent in 1996. Even if Japanese exports are excluded, there has been a markedly better export performance in Asia than in Africa and Latin America during the past thirty years (see Exhibit 6). Not surprisingly, the export-oriented economies of Asia experienced real GDP growth rates averaging 5-7 percent annually, enabling many countries in the region to reduce poverty dramatically. Less trade-oriented countries in other regions have grown far less and have made only limited progress in alleviating poverty.

¹ Real trade is equal to half the sum of real exports and real imports.
Index Values, 1967 = 100.

![Graph showing the growth of global exports and GDP from 1965 to 2000. The graph compares GDP and trade index values.]

Source: International Monetary Fund.


![Bar chart showing the percentage of global export shares and GDP growth for Western Hemisphere, Africa, and Asia (excluding Japan) in 1967 and 1997.]

Source: International Monetary Fund.
A growing body of empirical work supports the contention that trade enhances long-term growth in excess of the gains predicted by comparative static models. Several studies, using different methodologies, have found a positive correlation between export growth and GDP growth. Other studies have found that: (1) the technology embodied in imports positively affects domestic productivity, (2) countries that trade more invest more, (3) trade distortions reduce growth, and (4) open economies are converging at higher income levels than relatively closed economies. Each of these findings suggests that the dynamic gains from trade liberalization are substantial.

Increasing exports through trade liberalization also has substantial microeconomic benefits. U.S. studies indicate that exporters pay higher average wages for both production and nonproduction workers. Exporting plants are also more productive than plants that do not export, even when controlling for plant size. Research has shown that exporters are less prone to closure than are plants that rely only on the domestic market.

In sum, the case for market opening is overwhelming. Theory predicts that liberalization should raise global and national output and incomes. Newer models that try to account for dynamic gains from liberalization suggest that the benefits of trade are even higher than economists originally thought. The actual economic data generated by fifty years of trade liberalization are, if anything, even more impressive than theory predicts.
Chapter 4:

Structural Change, Economic Performance, and the Role of IT Trade – The U.S. Experience

Despite the obvious benefits of market opening, in terms of income and welfare, the process of liberalization often requires arduous and time-consuming negotiations. This paradox is understandable. Because tariffs and other trade barriers have distorted the allocation of labor and capital resources, workers and the owners of capital in protected sectors have a stake in maintaining the status quo. Market opening is also politically difficult because the benefits spawned by liberalization are often diffuse, whereas the costs of liberalization are often concentrated. Economic and even national security concerns can weigh down the momentum toward liberalization as well, because many governments prefer to maintain production activity across a wide spectrum of manufactured and agricultural products. Moreover, some governments view industrial development as being too important to be left to market forces.

The first ITA succeeded precisely because many of those obstacles were irrelevant to IT products. With the level of protection on many IT products already very low, opposition from vested interests was less fierce. With intra-industry trade in IT products relatively substantial, it was clear that rising trade levels and output within the sector would facilitate the absorption of any displaced resources. With industrial policies, where they existed, focusing on the creation of high-tech parks, trade protection was not viewed as a major tool of sectoral development.

Efforts to expand the ITA, however, are floundering, in part, due to the traditional hang-ups. As some countries negotiate to widen product coverage to include consumer electronics, special interests in some quarters have been energized. As the November WTO ministerial meeting approaches, some governments seem willing to allow IT liberalization to
occur within the context of a comprehensive, multilateral round. Increasingly worried about competitiveness, many governments now seem reluctant to ease barriers further. In short, rather than looking at the big picture, negotiators are again focused on the narrow issues that have made trade liberalization a laboriously slow process.

**Trade Liberalization and Structural Change**

In the postwar era, one of the most noteworthy trends has been the structural change in the economies of many developing countries that changed from agri-based to manufacturing-based economies. That trend was undoubtedly spurred on by trade liberalization of manufactured goods. Countries with small domestic markets could not have obtained such growth and structural change without access to outside markets. Trade enabled many outwardly oriented countries to expand their output and become increasingly wealthy. At the same time, trade enabled those countries to acquire technologies that raised productivity. The traditionally industrialized countries benefited from lower costs and greater access to developing-country markets, and also benefited because increasingly wealthy developing countries became more prolific importers of advanced-country products.

In other words, the waves of tariff reductions that occurred under the auspices of the GATT were a key driver of the structural change that remade many developing economies. Without lower tariffs in industrialized countries, import demand in advanced countries would have grown more slowly, leading to fewer developing-country exports, a slower transformation to manufacturing-based economies and, ultimately, slower growth. In fact, many countries that did not fully take advantage of trade opportunities experienced slower economic growth, and now find themselves with outdated manufacturing technology or, worse, still dependent on the production and export of a handful of commodities.

Though the information age is in its infancy, a strong argument can be made that the global economy is undergoing another structural transformation, which will be based on the absorption and use of information technology. Moreover, as with the last period of structural change, the economies that take advantage of new opportunities quickly
will perform better than the economies that adapt more slowly. By further reducing barriers to the free flow of information products across borders, ITA-2 would hasten the speed with which countries absorb and exploit information technologies. Countries that lag in adopting IT products and services, and are slow to adapt to the requirements of the information age, risk falling behind.

The performance of the U.S. economy is perhaps the best argument for reducing trade barriers on IT products even more. The United States, which has embraced IT more than any other country, has had the best economy in a generation. Though appropriate macroeconomic policies have been indispensable in prolonging the current U.S. expansion, there is a growing consensus that the production, trade, and use of IT goods and services have played important roles as well.

Microeconomic Benefits of IT

Information technology is having a profound impact on the U.S. microeconomy. Firms, business processes, and even products are changing, and the firms that are embracing change are achieving higher revenues at lower costs. Labor is also benefiting, even though technological progress is often associated with reduced demand for labor. Consumers who use the new technology are better off as well.

More Profitable Companies

Ongoing research at ESI has found that information technologies, in particular those that facilitate networking, have helped firms in several ways. Similar to the way trade enables countries to produce more of what they do best, networking technologies are enabling companies to focus on doing what they do very well, while outsourcing the rest. Preliminary research shows that firms that have outsourced successfully enjoy higher revenues per employee, a measure of productivity, than do competitors who have lagged behind. In addition, the aggressive use of IT has shortened cycle times for a number of business processes, including product development, filling orders, and internal accounting. Cost structures are being reduced as firms that make prudent use of IT find new, less expensive ways to accomplish repetitive tasks and to keep
inventory levels low. These technologies are also changing the relationship between consumers and producers, enabling businesses to reach, understand, and satisfy customers in new ways.

ESI research has found that the companies making the best use of information technology are in a virtuous circle. Lower expenses for sales, general and administrative activities; lower inventories; lower working-capital costs; lower-cost product development; more efficient inbound and outbound logistics; higher productivity workers; more satisfied customers; and the identification of profitable new core competencies all translate into bottom-line results for companies. Revenue is higher and costs are lower, creating better margins, higher profits, and greater capital market valuation (see Exhibit 7).

**Exhibit 4.7: Ratio of U.S. Corporate Profits to GDP, 1970-1999Q1.**

![Graph showing the ratio of U.S. Corporate Profits to GDP from 1970 to 1999Q1.](image)

Source: U.S. Bureau of Economic Analysis

The capital market’s higher valuation for these firms lowers their cost of capital, giving them access to the capital to support even greater and faster growth (see Exhibit 8).

**Exhibit 4.8: Impact of Information Technologies on Firms.**
More and Better-Paying Jobs

Even though the academic economists often attribute job losses to technological advances, the U.S. experience shows that technology can create jobs as well. Job creation is occurring mostly in software and service industries and in technology-using industries, as opposed to the traditional manufacturing industries.

During the 1990s, IT-producing industries (i.e., producers of computer hardware and software, communications equipment and services, and instruments) have generated about 700,000 jobs on a net basis. Between 1989 and 1997, employment in IT-producing industries expanded 2.4 percent per year, compared to 1.7 percent for the economy as a whole. Fastest growth has occurred in the software and services industry, which expanded at an 8.8 percent clip, making it the largest IT
group in terms of employment. According to the U.S. Bureau of Labor Statistics, growth in that sector is expected to remain robust, with one million additional jobs expected by 2006. On the other hand, employment gains among goods producers was minimal from 1989 to 1996, as gains among makers of computer hardware were offset by losses in communications equipment (see Exhibit 9).


The employment performance of IT-using industries (i.e., health services, brokerages, telecommunications and TV broadcasting, and other industries with high levels of IT investment) has also been strong. Those industries created a net five million jobs between 1989 and 1996, according to the Bureau of Labor Statistics, and are expected to add another ten million jobs by 2006.

Both IT-producing and IT-using jobs pay better-than-average wages. In 1997, employees of IT-producing industries earned $53,000, seventy-seven percent more than the economy-wide average of $30,000. Though the wages paid by IT-using industries are less impressive, the
workers in those industries earned almost 13 percent more in 1997 than the average U.S. worker (see Exhibit 10).

**Exhibit 4.10: Wages in IT-Related U.S. Industries, 1989 and 1997.**

![Graph showing wages comparison between 1989 and 1997 for different industries.]


This combination of employment growth and high wages bodes well for the U.S. economy. If present trends continue, industries that make, and are major users of, IT-related goods and services will employ almost half of the private U.S. workforce by 2006, translating into higher living standards for Americans. If BLS estimates are correct, IT-using industries will employ roughly eight times as many workers as IT-producing industries, and among IT-producing industries, employment will be dominated not by goods producers, but by producers of software and services.
More Consumer Choice

Consumers are typically singled out as being the ultimate beneficiaries of market opening, and rightfully so. Lower trade barriers usually confer more choice and lower prices on consumers.

Market opening in IT is no different in that regard, but to the extent that lower trade barriers accelerate consumers’ usage of IT products, additional gains are possible. Computers connected to the Internet, for instance, enable consumers to be better informed about available goods and services. With that information in hand, consumers can save money on a range of items, not just those related to IT. Networking technologies also allow individuals to interact more with manufacturers and service providers, better enabling producers to fulfill consumer demands.

IT and the Macroeconomy

At the outset of the 1990s, the conventional wisdom held that the U.S. economy could comfortably grow roughly 2.5 percent annually. The thinking behind that forecast was simple. The U.S. workforce was expected to expand one percent per year, while productivity was growing 1.5 percent annually. If economic growth were any faster, it was believed, unemployment would fall below 6 percent, leading to inflation and, ultimately, to higher interest rates until growth returned to trend.

U.S. economic performance has surpassed those expectations. The U.S. unemployment rate has been below six percent since September 1994, yet inflation has remained benign. As of June 1999, the unemployment rate stood at 4.3 percent, a level last achieved thirty years ago during the Vietnam War. Inflation, as measured by the GDP price index, was at levels not seen since the early 1960s. Year-over-year, quarterly real GDP growth has been well above the predicted 2.5 percent trend for the past twelve quarters.

This outstanding run is no doubt attributable to many factors. However, there is strong evidence that the production and use of information technology has had a major impact on the U.S.
macroeconomy, especially during the past four years. Statistics on output, productivity, inflation, and inventories paint a compelling picture of IT’s role in driving the U.S. economy during the 1990s.

**Increased Output**

Industries that produce information technology goods and services are an increasingly important part of the U.S. economic output. In 1993, IT production accounted for 6 percent of the U.S. economy, in nominal terms. The IT share had grown to 7 percent by 1996, and is expected to reach 8 percent by 1999, according to the U.S. Department of Commerce. This is an impressive feat in a fast-growing economy.

As imposing as those figures are, they understate the impact of IT production on the real (i.e., inflation-adjusted) economy. Because nominal IT prices have been declining, real output has been rising even faster than the nominal figures suggest (see Exhibit 11). Though IT production accounts for about 6-8 percent of the U.S. economy, the growth of real IT output has accounted for about one-third of U.S. real economic growth between 1993 and 1996, and is estimated to have achieved a similar contribution in 1997 and 1998.

**Exhibit 4.11: IT-Producing Industries’ Contribution to U.S. Economic Growth.**
Growing production and use of IT products and services has translated into growing IT trade. Combined U.S. exports and imports of IT manufactures expanded 11.7 percent annually from 1993 to 1997, compared to an 8.1 percent growth rate for non-IT products. Trade in IT services rose an even faster 13.2 percent annually, one-and-a-half times as fast as other private service exports. The United States is running a substantial deficit in IT trade. Services trade is relatively balanced, because the surplus in computer-related services is offset by a deficit in telecommunications services. However, the deficit in IT goods trade has ballooned from $33 billion in 1993 to $55 billion in 1998, in part due to the Asian financial crisis.

**Productivity**

IT-producing industries have had a major, though somewhat uneven, effect on productivity. From 1990 to 1997, value added per worker in IT-producing industries expanded 10.4 percent annually, more than seven times the rate of total, private, nonfarm productivity. Productivity at IT manufacturers expanded at a 23.9 percent clip, while productivity at IT service providers expanded 5.8 percent annually. Manufacturers that were heavy users of IT saw their productivity grow by a higher-than-average 2.4 percent per year. Overall, manufacturing productivity has grown by 40 percent during the 1990s, compared to 29 percent during each of the previous two decades.

Paradoxically, service providers that make major use of IT experienced negative productivity growth of minus 0.3 per year from 1990 to 1997, despite large investments in IT. Observers explain this anomaly as partly the result of a lag in productive applications of the new technologies and partly due to problems of measurement that government statistical agencies are working to overcome. Whether or not these explanations are valid, many IT-using service industries (e.g., securities and commodities brokers, railroad transportation, and pipelines) are experiencing productivity growth that is much faster than average. Moreover, the services average is weighed down by the poor performance.
of providers of health and legal services, which accounted for 11.5 percent of services output in 1996.

However the debate about productivity and service industries is resolved, one thing is clear. Overall U.S. productivity would have been much worse without the exceptional improvements that occurred in IT-producing industries and in manufacturers that used IT intensively.

**Inflation**

The data on inflation is less ambiguous. As mentioned earlier, the combination of low unemployment and rapid economic growth are believed to be inflationary, yet U.S. inflation has remained tame. Though declining commodities prices are partly responsible, the falling prices of IT goods and services, many of which are imported, are an important part of the equation. In 1996 and 1997, the prices of IT output declined by 7 percent and 7.5 percent respectively, compared to an inflation rate of 2.6 percent for the rest of the economy. As a result, inflation, as measured by the GDP deflator, was only 1.9 percent in both years. It is also likely that the IT impact on inflation was even more pronounced because the adoption of IT may have enabled IT-using industries to keep their prices down.

In sum, the dynamic benefits of IT usage appear to be substantial. The benefits of IT are affecting firms, workers, and consumers in many positive ways. As a result, the overall U.S. economy is performing better than expected. Real output has grown faster and longer than many believed possible, productivity is improving, and inflation remains low. The statistics make clear that the benefits of IT stem from both the production and use of IT products and services. Both producers and users of IT have higher-than-average wages and have been adding employees. Productivity gains have been spectacular for IT producers, but many heavy users of IT, especially manufacturers, have also achieved major gains.

Trade has also been a major contributor to this story. Imports and productivity gains have kept the cost of IT products and overall inflation low. Rising exports and rising production have yielded
disproportionately large gains to real GDP. The expansion of exports and imports is being facilitated by reduced trade barriers at home and abroad. Competition from imports is helping to keep domestic prices low and is thereby increasing the speed with which IT penetration takes place.

The U.S. experience provides two interesting lessons to countries that are considering protection of their high-tech manufacturing industries. Though such industries have achieved remarkable growth in output and productivity, their employment performance has been relatively poor. In the United States, the real employment gains have come in IT-using industries and in software and related services. If job creation is a country’s primary goal, a strategy of IT diffusion augmented by lower trade barriers seems more appropriate than a strategy of protection.

The second lesson is that the use of IT may be just as important as the production of IT, from the standpoint of the overall economy. As illustrated above, IT production has grown hand-in-hand with IT consumption in the United States. In fact, the U.S. trade deficit in IT goods and services indicates that the United States is consuming more IT products than it produces. In Asia, the situation is just the opposite. Over the past five years, IT-related production has made up 5 to 9 percent of GDP in Asian countries, while the utilization of information technology in Asia has accounted for only 1 to 3 percent of GDP, according to statistics cited by Intel’s Andrew Grove. This will clearly have to change if countries in Asia and other regions are to prosper in the information age.
Chapter 5: Conclusions

With the memory of the Asian financial crisis fresh on everyone’s mind, it is perhaps easy to forget the favorable impact that five decades of trade liberalization have had on global living standards. Unfortunately, the crisis and other events have negotiators focusing on narrow issues. The ITA process appears set to be an early casualty of this cautious mindset.

Rather than retreat from the task at hand, negotiators from the world’s IT producers should commit themselves to reinvigorating the ITA process and completing an agreement before the Seattle WTO ministerial meeting begins in November.

The case for concluding an accord is overwhelming. Trade liberalization has coincided with remarkable economic growth during the postwar period, the Asian crisis notwithstanding. Countries that have embraced trade have done well. Those that have not have done poorly. Through trade, countries transformed themselves from commodities producers to industrial powerhouses.

Though industrial policies that selectively closed markets were admittedly part of this transformation for many countries, such policies were also a proximate cause of the recent economic crisis. More importantly, policies that cultivated manufacturing prowess seem ill-suited for the emerging digital economy, in which substantial economic gains are derived from the use of IT goods and services, not just from the production of high-tech goods. Put another way, countries that decide to focus only on the benefits of manufacturing will find themselves unable to capture the full range of advantages IT has to offer.

Those advantages appear to be substantial. It is increasingly evident that the recent U.S. economic expansion has been driven, in part, by information technology. The statistical mosaic of America’s emerging
digital economy shows that IT has helped increase output, employment, and productivity across a range of industries. Imports of IT goods have helped keep U.S. inflation under control, facilitating the penetration of IT throughout the country. The rapid penetration of IT is conferring spectacular benefits on firms and individuals who use the technology. Business processes are changing, as are the ways in which companies interact with their customers. Profits are rising, as are consumer choice and awareness.

Ironically, when ITA-1 became a reality in late 1997, the vast potential of IT and the global information infrastructure was an article of faith. There was little data to buttress the argument that free trade in IT products and services would be an important enabler of technological diffusion and progress. Despite the lack of proof, negotiators took the plunge. Yet today, armed with more convincing data, they seem reluctant to commit to an agreement that would extend the benefits of IT even further.

It is to be hoped that a fresh look at the evidence will bring the faithful back to the negotiating table.
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