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Boosting Exports, Jobs, and Economic Growth by Expanding the ITA

BY STEPHEN J. EZELL | MARCH 2012

ITA expansion would increase U.S. exports of ICT products by $2.8 billion, boost revenues of U.S. ICT firms by $10 billion, and support creation of approximately 60,000 new U.S. jobs.

The Information Technology Agreement has been one of the most successful trade agreements ever undertaken; it's time to expand the coverage of the agreement and in so doing boost exports, jobs, innovation, productivity, and economic growth both in the United States and around the world.

BACKGROUND

In December 1996, 29 World Trade Organization (WTO) member nations launched the Information Technology Agreement (ITA), a novel trade agreement in which participating nations completely removed tariffs on eight categories of information and communications technology (ICT) products covered under the agreement (such as semiconductors, computers, and telecommunications equipment). Today, 73 nations are ITA signatories, and in its first decade and a half, the ITA has had a significant impact on expanding global trade in ICT products. From 1996 to 2008, total global trade in ICT products increased more than 10 percent annually, from $1.2 trillion to $4.0 trillion, with this growth bolstered not just by the growth of the ICT industry but also by liberalization of trade in ICT products. Moreover, the ITA has empowered the formation of efficient global ICT supply chains which have enabled a shift from a closed, linear innovation model to an open innovation model that relies on close collaboration among suppliers, network partners, and customers to bring breakthrough new ICT products to market.[1] In short, the ITA has played a critical role in promoting ICT trade and investment, which in turn has driven innovation, boosted productivity, increased employment, accelerated economic growth, and produced prosperity for all nations.

Much has changed since the ITA first took effect, yet the product scope of the ITA has not been expanded since the agreement was launched in 1996. Even then, the initial ITA agreement did not cover a number of core ICT products such as DRAMs (dynamic random access memory chips) nor dozens of every-day consumer electronic products, including many types of audio-visual equipment such as audio speakers, DVD players, and video cameras. Moreover, technology has since spawned the creation of hundreds of innovative new information technology products, everything from GPS systems and flat panel displays to video game consoles like Microsoft's xBox or Sony's Playstation, and remote home and patient monitoring devices as well as an entirely new class of semiconductor chips called multi-component (MCO) semiconductors, many of which are not covered under the ITA's tariff-eliminating regime.

For all these reasons, it's time to embark on an expansion of the products covered by the ITA, which would yield substantial benefits by removing tariffs on a significant array of ICT products not currently covered by the agreement. In fact, an expanded ITA could remove tariffs on at least an additional $800 billion in ICT trade globally, a 20 percent increase over the $4 trillion now covered annually. Moreover, ITIF estimates that ITA expansion would increase U.S. exports of ICT products by $2.8 billion, boost revenues of U.S. ICT firms by $10 billion, and support creation of approximately 60,000 new U.S. jobs throughout the economy. This paper makes the case for ITA expansion by first documenting the central role ICT plays in economic growth and then explaining why ITA expansion is good both for the United States and for the rest of the world, developing countries in particular.

THE ROLE OF ICT IN THE GLOBAL ECONOMY

Information and communications technology constitutes one of the global economy's most important industries. In fact, global value-added by ICT industries more than doubled from $1.2 trillion in 1995 to $2.8 trillion in 2010 (see Figure 1), and today the ICT industry accounts for 6 percent of global GDP.[2] ICT industries also account for a notable share of employment; for example, in 2010, ICT industries employed 5.8 percent of workers in OECD economies, a 13 percent increase over the 5.1 percent they employed in 1995.[3]

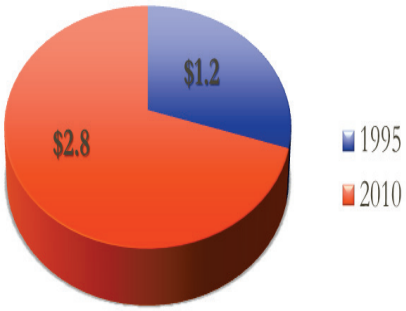

Figure 1: Global Value-Added by ICT Industries, 1995 and 2010

Yet ICT's impact on the global economy goes far beyond the industry's direct contributions to GDP and employment, for ICT is the global economy's strongest driver of productivity, innovation, and ultimately economic growth.[4] ICT achieves this status by virtue of being today's pre-eminent general purpose technology, or "GPT." GPTs such as ICT are transformative "platform" technologies that share three key characteristics: 1) they are pervasive, touching all industries and sectors of the economy and society; 2) they simultaneously experience rapid performance improvements and price declines over time; and 3) they make it possible to invent and to produce new products (i.e., smart phones or the iPad); processes (i.e., self check-in at airports); business models (i.e., e-businesses or business models based on fractional ownership or the simultaneous aggregation of supply and demand); and even fundamental new inventions (i.e., mapping the human genome).[5]

ICTs are so powerful precisely because they enhance the productivity and innovative capacity of every individual, firm, and industry they touch—and this holds true for developed and developing countries alike.[6] In fact, ICT workers contribute three to five times more productivity than non-ICT workers.[7] In Canada, ICT use has been associated with higher labor productivity in the industries that adopt it.[8] In the United Kingdom, innovation—so much of it enabled by ICT—has accounted for 63 percent of annual labor productivity growth since 2000.[9] In Australia, ICT capital has been found to be more productive than other types of capital at the aggregate level in all industries.[10] In Chile, firms with greater ICT use had total factor productivity (TFP) 40 percent higher than those with lower ICT use.[11] Research performed in 2011 by Oxford Economics confirmed that ICT continues to generate a bigger return to productivity growth than most other forms of capital investment.[12] In other words, ICT is "super capital" that has a much larger impact on productivity than other forms of capital.[13]

ICT is just as vital to enabling innovation as to boosting productivity. For example, the OECD found that the probability of innovation in a firm increases with the intensity of ICT use, and that this held true for both manufacturing and services firms and for different types of innovation.[14] Likewise, in the European Union, 32 percent of companies report being "active innovators," with ICT enabling half of those firms' product innovations and 75 percent of their process innovations.[15] And the productivity gains and innovations driven by ICTs support job growth. Firms which are the most IT-intensive are 25 percent to 30 percent more likely to grow in terms of employment than low IT-intensive companies.[16] In the United States, companies that were "intensive users of ICT" grew jobs at a rate of 5.1 percent from 2001 to 2009 (even while overall employment shrank 0.5 percent over that timeframe).[17] Another study found that U.S. corporations investing more in ICT increased their workforces by 14 percent between 2006 and 2010, while the average increase for Fortune 500 firms was just 6 percent.[18] And even though ICT tools and platforms such as the Internet do render some jobs obsolete, the McKinsey Global Institute finds that the Internet has created 2.6 jobs for every job it has destroyed.[19]

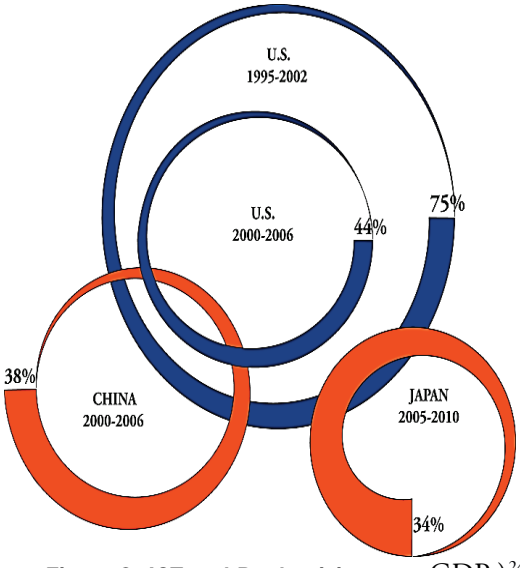

Figure 2: ICT and Productivity Growth in U.S., China, Japan

Ultimately, ICT's productivity-enhancing and innovation-enabling benefits at the individual, firm, and industry level then aggregate up to enable productivity and economic growth at an economy level. For example, ICT was responsible for 75 percent of U.S. productivity growth from 1995 to 2002, and 44 percent from 2000 to 2006.[20] According to Japan's Ministry of Internal Affairs and Communications, Japan's ICT industry has contributed 34 percent of the country's economic growth from 2005 to 2010.[21] Likewise, ICT usage in China has played a critical role in growth, accounting for 38 percent of TFP growth and as much as 21 percent of GDP growth.[22] (See Figure 2) In fact, the Internet alone accounted for 21 percent of the aggregate GDP growth from 2006 to 2011 across thirteen leading economies—Brazil, Canada, China, France, Germany, India, Italy, Japan, Korea, Russia, Sweden, the United Kingdom, and the United States.[23] (The Internet accounts for, on average, 3.4 percent of GDP across the large economies that comprise 70 percent of global GDP.)[24] And this highlights a vital point: while ICT production is important for economies, the vast majority of economic benefits from technology—as much as 80

percent—come from the widespread usage of technology, while approximately 20 percent of the benefits from technology comes from its production.[25] This means that countries should not focus just on ICT production; ICT usage is even more important.

Because ICT usage contributes greater benefits to economic growth, tariffs are particularly pernicious when applied to ICTs, hurting the nations that impose them by raising the cost of ICT goods and services, thus causing businesses (and individuals) to invest less in ICT, which lowers their productivity. Thus, not only do high tariffs on ICT products disadvantage more innovative, productive, and efficient foreign competitors while protecting domestic enterprises that often are less innovative, productive, or efficient, they raise the cost of ICT goods for ICT-using industries in an economy and inhibit the ability of those sectors to procure best-of-breed technologies at the best price. Hence, placing high tariffs on one sector of an economy (ICT) damages all the other sectors of an economy. And, by distorting global markets for innovative products and services, high tariffs disadvantage the economic interests of the most efficient and innovative enterprises, leaving the world with less innovation and higher-cost ICT products than would otherwise be the case.

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In contrast, cutting tariffs lowers prices on ICTs and raises demand for them. In fact, Gurbaxani et al. find that for every 1 percent drop in price in ICT products, there is a 1.5 percent increase in demand.[26] This is a nice example of what's called import demand elasticity—lower import prices lead to increased demand for a product or service. Low tariffs have also contributed to the development of global supply chains and the globalization of ICT hardware development that has also contributed to reducing ICT prices. In fact, Mann finds that the globalization of ICT hardware resulted in ICT prices some 10 percent to 30 percent lower than they would have been based on domestic production and domestic technological advances alone in the United States in the 1990s. Mann estimates this made U.S. GDP some $250 billion higher over the 1995 to 2000 period than it would have been had there been no globalization of IT hardware.[27] Put simply, ICT tariff elimination bolsters ICT usage, which in turn boosts productivity and generates innovation, and this is why the ITA and its expansion are so important.

BENEFITS OF ITA EXPANSION FOR THE UNITED STATES

Information technology is perhaps the U.S. economy's most dynamic industry, as Figure 3 summarizes. In 2009, ICT firms contributed about $1 trillion to U.S. GDP, or 7.1 percent of GDP.[28] Moreover, ICT's direct contributions to GDP have increased nearly 25 percent since the 1990s, growing from 3.4 percent of GDP per year from 1991 to 1993 to an average of 4.2 percent per year over the years 2005 to 2009.[29] Moreover, U.S. firms are the world's largest producers of ICT goods and services.[30] In 2010, U.S. ICT firms held a 26 percent share of the global ICT industry.[31] And ICT goods dominate U.S. exports of high-technology products. In fact, ICT goods account for nearly 45 percent of the United States' high-technology exports.[32] Semiconductor exports lead the way: from 2005 to 2009, semiconductors constituted the number one product export from the United States on an aggregate basis, with exports totaling $48 billion ($10 billion more than automobile exports, in second place).[33]

ITA expansion would provide three primary and a variety of ancillary benefits for the United States. First, foreign tariff removal on an expanded set of ICT products will boost U.S. exports of ICT goods and create U.S. jobs. In fact, we estimate that ITA expansion will boost direct U.S. exports of ICT goods and support creation of approximately 60,000 U.S. jobs. Second, as central players in the global ICT supply chain who collectively account for one-quarter of the global ICT industry, leading U.S. ICT goods companies such as Apple, Dell, Hewlett Packard, and Intel and ICT services companies such as Google, IBM, and Microsoft alike will benefit from the expansion of ICT trade globally. Third, although U.S. tariffs on non-ITA-covered ICT products are already less than those of almost all peer countries, U.S. consumers will benefit from complete tariff removal on an expanded range of ICT products.[34] In addition, U.S. leadership in promoting ITA product expansion will further bolster the United States' position as a leading advocate of greater global multilateral trade liberalization at a time when some actors around the world are implementing protectionist policies at an alarming rate.[35]

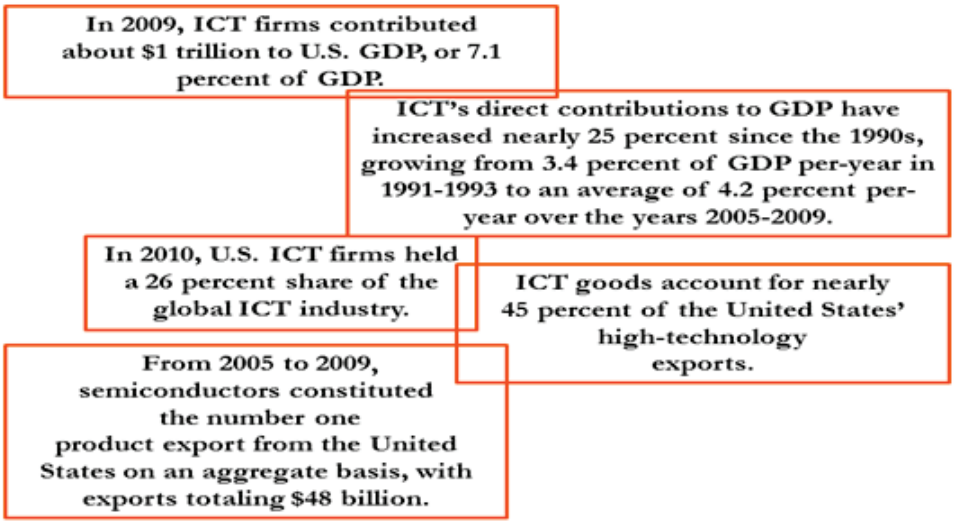

Figure 3: The Impact of ICT on the U.S. Economy

ITA expansion would boost U.S. exports and create U.S. jobs. The United States exported $142.5 billion of ITA products in 2008 (the most recent year for which data are available).[36] If the ITA is expanded as proposed by U.S. industry,[37] an additional $40.6 billion of U.S. ICT exports will come under ITA coverage,[38] yet the reduction in the tariffs imposed on those products will simultaneously expand global demand for them. The global, weighted-average, most-favored nation (MFN) tariff on ICT goods not currently covered by the ITA is 5.3 percent.[39] The World Bank provides import demand elasticities—a measure of how much demand for a product will increase in a country given a certain reduction in tariff levels—for 70 of the 73 ITA member countries.[40] By applying an average, ITA-import weighted import demand elasticity to the 5.3 percent average reduction of ITA tariffs multiplied against the $40.6 billion of U.S. ICT exports that will come under ITA expansion suggests expansion will boost direct U.S. exports of ICT goods by approximately $2.8 billion annually. This would further the President's National Export Initiative goal of doubling U.S. exports within five years. Indeed, a number of U.S. ICT industries would benefit significantly from the expanded exports that substantial tariff

reductions achieved by ITA expansion would bring. For example, while PC-based games are exported duty-free to ITA-participating countries, tariffs for the same titles sold on consoles such as Microsoft's Xbox 360 are subject to tariffs of 10 percent in India; 15 percent in Indonesia; 20 percent in Thailand; and 23 percent in Vietnam.[41]

The product scope of the ITA has not been expanded since the agreement was first launched in 1996.

Given that the U.S. Department of Commerce reports that for every $1 billion in manufacturing exports, 6,250 jobs in manufacturing companies are created or supported,[42] ITA expansion would therefore directly support the creation of approximately 17,500 jobs. And these would be exactly the type of high-skill, high-tech, high-paying jobs the United States wishes to produce. For example, in 2008, U.S. ICT workers on average earned $74,500, 75 percent more than the average U.S. worker's wage of $42,263.[43]

These jobs, however, would also support others in the economy, for most economists agree that jobs in manufacturing and export-oriented technology industries have a large multiplier effect. For instance, the Economic Policy Institute finds that manufacturing jobs have a robust employment multiplier of 2.90, compared to 1.63 in business services or 1.66 in transportation (meaning that one manufacturing job supports the creation of 2.9 other jobs in the economy).[44] Similarly, the Public Policy Institute of New York State has found a national average job multiplier of one manufacturing job creating 2.34 jobs in other sectors. Jobs created in the U.S. electronic computer manufacturing industry have higher employment multipliers than those in virtually any other industry. For example, a June 2009 Milken Institute report, *Manufacturing 2.0*, found that 15 other jobs are supported for every job created in California's electronic computer manufacturing industry.[45] The Public Policy Institute of New York State finds an employment multiplier of 9.2 for every electronic computer-manufacturing job created in the state of New York.[46] Likewise, the Economic Policy Institute finds that, on a national level, jobs in computer equipment manufacturing have a high multiplier of 9.05. As the report notes, "The computer equipment and office machinery industry has the single highest employment multiplier in the entire manufacturing sector; 905 indirect jobs are supported for each 100 jobs in this sector."[47] So it's clear that the jobs created by ITA expansion will have a high multiplier effect. Even applying a conservative multiplier of 2.6 suggests that ITA expansion will support the creation of a total of approximately 45,000 direct, indirect, and induced jobs throughout the U.S. economy.[48]

But more than just directly bolstering U.S. exports, ITA expansion will also boost global demand for ICT products. In fact, if the ITA is expanded as proposed, approximately $800 billion in additional global two-way trade in ICT products will come under ITA coverage. Put differently, an additional $400 billion of global ICT imports would come under ITA coverage and see tariffs on those imports reduced to zero. Again applying an average tariff rate reduction of 5.3 percent on the newly ITA-covered products to the average, trade-weighted import demand elasticity figures and multiplying that by the $400 billion in newly covered ITA imports suggests the tariff reduction engendered by ITA expansion would result in an increase of $28 billion in global demand for these newly ITA-covered ICT products. And that's vitally important, because 70 percent of ICT spending already occurs outside the United States.

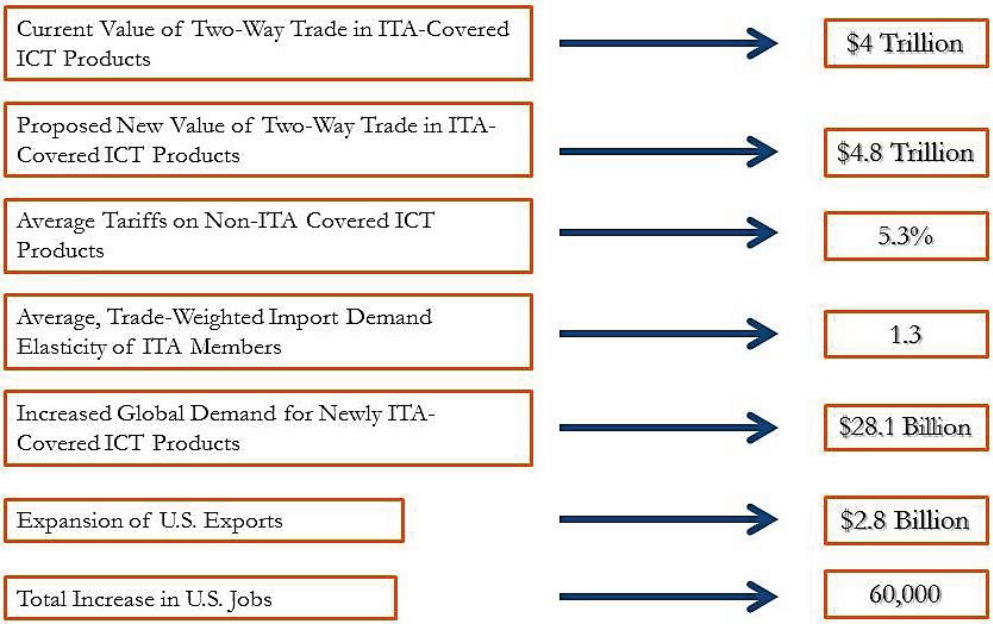

Figure 4: Methodology to Calculate Impact of ITA Expansion on U.S. ICT Exports and Jobs

Since the U.S. ICT industry accounts for about one-quarter of the global ICT industry, this means that a significant share of this increased global demand will be filled by U.S. ICT firms, even if the U.S. ICT goods manufacturer assembles certain products in Taiwan or China that are destined for sale in Germany or South Africa. In other words, it's not just about exports from within U.S. borders; making the ITA stronger will expand the overall global ICT market, making the U.S. ICT industry stronger in the process.

In fact, if U.S. ICT firms capture their one-quarter share of the expanded $28 billion market, their revenues should grow by approximately $7 billion. (Adding this figure to the $2.8 billion in increased exports suggests that ITA expansion will generate approximately $10 billion in new revenues for U.S. ICT firms.) These increased revenues will lead to increased investment by U.S. ICT firms in research and development (R&D) to create the next generation of innovative ICT products. In fact, no major sector of the U.S. economy invests more in R&D than computers and electronic products, which has an R&D intensity of 10.1 percent, more than three times the U.S. industry average. And semiconductors are the most R&D-intense U.S. industry, investing 24 percent of their sales into R&D annually.[49] And among non-manufacturing industries in the U.S. economy, the two most R&D-intense are e-businesses and software, demonstrating that ICT firms are a vital driver of R&D in the U.S. economy.[50]

But this expanded global revenue will also lead to hiring in the United States. A review of the annual reports of the top 10 U.S. ICT firms finds a revenue/employee ratio of approximately $500,000, which suggests these firms will hire approximately 15,000 new employees to fill this expanded demand. And while certainly some of those employees will be located in foreign markets to meet foreign demand, a large number of them will be high-skill positions in R&D, design, marketing, sales, management, logistics, etc.—positions often located in the U.S. headquarters of these firms. And even when some of those jobs are filled abroad, they often support U.S. employment at home, because

employment in U.S. parents is likely to increase with increases in U.S. affiliate activity. In fact, one study finds that an increase in U.S. affiliate employment of 1 percent is associated with an increase in parent employment of 0.2 percent.[51] In other words, U.S. affiliate activity abroad is often a complement to, rather than a substitute for, the activity of parent companies in the United States.[52] So even assuming that half of these new positions are filled abroad, the increase in global demand for ICT products engendered by ITA expansion will support at least 7,500 additional high-skill U.S. jobs. Applying a conservative multiplier of 1.7 to those 7,500 jobs suggests the creation of at least 15,000 jobs from this dynamic.[53] Thus, in total, ITA expansion will support the creation of over 60,000 U.S. jobs.

Of course, U.S. consumers—as with consumers in all countries—will also benefit from cheaper imports of ICT products. In fact, four distinct categories of users benefit from cheaper ICTs in ways that drive overall U.S. economic growth. First, ICT has helped spawn the emergence of "prosumers," individuals who act at the same time as both consumer and producer.[54] The digital economy has blurred the dichotomy between producers and consumers, as the spread of digital tools have empowered consumers to fill production functions—like booking their own hotel rooms or choosing their seat on a flight—once managed by producers. Second, ICT has further spawned what MIT Professor Eric von Hippel calls "the age of the consumer-innovator," where consumers collectively generate massive amounts of product innovation, often empowered by ICT.[55] Third, non-ICT producing industries, especially those that intensely consume ICT products—such as airlines, financial services, logistics, and manufacturing firms as well as e-businesses and software developers—will benefit from access to cheaper ICT products. Fourth, U.S. ICT-producing industries themselves will benefit from the cheaper imports of the component parts and products in their supply chains. In fact, products included in the NAICS 334 category "computer and electronic product manufacturing" account for 43.5 percent of the total intermediate inputs in audio, video, and communications equipment manufacturing; 27.2 percent of the intermediate inputs in semiconductor manufacturing; and 22.2 percent of the intermediate inputs in electronic instrument manufacturing.[56] Thus, lower tariffs placed on these intermediate ICT inputs will lower the final cost of the ICT end-products, such as computers. And even though U.S. tariffs on ICT products not covered by the ITA are already quite low, these four types of U.S. consumers will still benefit from ITA expansion. Those in developing countries will benefit even more.

ITA EXPANSION BENEFITS DEVELOPING COUNTRIES

Developing countries account for 42 percent of ITA membership,[57] and the ITA has benefitted these countries considerably. From 1996 to 2008, developing country ITA exports expanded at an annual rate of 33.6 percent, compared to 7.2 percent for developed countries.[58] And given the rapid growth of ICT production and consumption in their economies, the ITA is even more relevant today for many developing countries such as India, Malaysia, the Philippines, Thailand, and Vietnam than it was even when they first joined. The ITA and ITA expansion benefit developing countries in three principal ways: 1) reducing tariffs on a broader range of ICT products encourages greater adoption of ICT products that play a key role in spurring economic growth; 2) lower prices realized by reducing tariffs on ICTs increases the productivity of all other industries in a developing

economy; and 3) by lowering the price of a key input, the ITA has undergirded development of the burgeoning ICT software and services industries in many developing countries such as India, Indonesia, Malaysia, and the Philippines.

ICT products have undergirded the development of the vibrant IT software and services industries in many developing countries.

Greater penetration of ICTs among consumers and businesses boosts economic growth in developing countries—a process abetted when tariff removal lowers the price of ICT products, fostering their expanded use. For example, The World Bank found that a 10 percent increase in broadband Internet penetration adds 1.38 percent to annual per-capita GDP growth in developing countries. Likewise, a 10 percent increase in mobile phone penetration adds 0.81 percent to annual per-capita GDP growth.[59] A study of 131 developing countries found that a one-unit increase in ICT usage contributed to an approximately 0.1 percentage point increase in their GDP growth rate between 1995 and 2006.[60] And a study of 4,800 small to medium-sized enterprises (SMEs) in twelve countries (including developing ones such as China, India, and Russia) found that companies using Web technologies grew twice as fast as those with a minimal Internet presence.[61] Those SMEs were also found to experience a 10 percent productivity boost from Internet usage.[62]

A 2007 World Bank survey of over 20,000 businesses in low- and-middle income countries found that firms that use more ICT have faster sales, employment growth, and higher productivity.[63] Likewise, Joseph and Abraham found ICT investment in the Indian manufacturing sector was a key factor to rapid increases in labor productivity.[64] A study of six West African countries found that approximately 40 percent of their increase in total factor productivity growth was attributable to ICT-related growth.[65] Such productivity gains are the source of reduced poverty and higher living standards. In addition to boosting productivity, ICT adoption also supports export growth in developing economies. For example, one study that analyzed the impact of Internet penetration rates in 66 developing countries found that a one percent increase in the number of Internet users is associated with a 4.3 percentage point increase in exports.[66]

Thus, extensive, economy-wide use of ICTs is vital for developing economies to grow. Despite this, many developing countries, have placed high tariffs on ICTs in an effort to spur creation of domestic information technology production industries. For example, Argentina has imposed tariffs on assembled computers, though not on computer parts, with the goal of creating a domestic computer assembly industry. But the result has actually been to create a less efficient and higher-cost computer industry where up to one-third of computers sold in Argentina are hand-assembled in small shops. Brazil has likewise long-placed high tariffs on imports of foreign computers and component parts. Similarly, Argentina's recent introduction of protectionist policies demanding equality of imports and exports as a condition for granting import licenses[67] has resulted in no Apple or RIM smartphones being imported for nearly a year.[68]

Yet despite their good intentions, high tariffs and other protectionist policies applied to ICT products have only had the effect of raising the prices of ICTs for domestic users, inhibiting ICT diffusion throughout domestic sectors such as financial services, manufacturing, retail, and transportation, lowering the rate of productivity growth. For example, Kaushik and Singh found that for every $1 of tariffs India imposed on imported

ICT products (in years before it joined the ITA), it suffered an economic loss of $1.30, due to lower productivity. As Kaushik and Singh found in their study of ICT adoption in India, "High tariffs did not create a competitive domestic [hardware] industry, and [they] limited adoption [of ICT by users in India] by keeping prices high."[69] In other words, India's tariffs on ICT products reduced domestic ICT investment which in turn limited productivity growth.

Ultimately, tariffs on ICT products do not create a competitive domestic hardware industry as is often intended, but high tariff policies do have profoundly negative consequences in limiting adoption of ICT by keeping prices high. As Kraemer and Dedrick found in a cross-national study of Asia-Pacific region countries, any government policy that makes computers less expensive will encourage the use and increase the benefits of ICT.[70] As Kraemer notes, "One of the best ways to promote ICT use is to not create barriers to use. Any government policy that makes computers more expensive will discourage use and reduce the possible benefits of IT. Simply lowering tariffs and taxes, eliminating other trade barriers, and encouraging competition in distribution channels will help promote use as much as any specific efforts to encourage use."[71]

ICT products have been responsible for undergirding the development of the information technology/business process outsourcing (IT-BPO) industry in many countries (another reason why countries that place high tariffs on ICTs only do themselves a disservice). For example, India's IT-BPO industry accounted for 6.4 percent of Indian GDP in 2011, a significant increase from 1.2 percent in 1998. Indian IT-BPO revenues reached $88.1 billion in 2011 while direct employment totaled 2.5 million, and indirect job creation equaled an additional 8.3 million jobs. Moreover, the IT-BPO industry (including hardware and services exports) accounts for a significant share of the country's exports, and have increased from less than 4 percent of India's exports in 1998 to account for 26 percent in 2011.[72] At current rates, India's ICT sector is poised to become a $225 billion industry by 2020.[73] ICT services industries have also grown rapidly throughout Southeast Asia, including in Indonesia, Malaysia, and the Philippines, where in 2006, for example, 160,000 Philippine citizens were employed in the country's $2 billion business process outsourcing industry.[74] In fact, total ICT and ICT-enabled services revenues in the Philippines reached $6 billion in 2008, up from $100 million in 2001.[75]

Indeed, the ITA has helped boost exports of ICT goods and services in many ITA member countries. Exports of ICT goods account for 54 percent of the Philippines' total goods exports, 38 percent of Malaysia's, 20 percent of Thailand's, and 6 percent of Indonesia's, all four of which are ITA signatories. In fact, ICT goods exports account for far higher shares of total goods exports in ITA member countries than some non-ITA member countries, with Brazil, Argentina, and Chile (none of which are members of the ITA) clearly lagging, as Figure 5 illustrates. This trend is also clear when examining the percentage change in countries' ICT goods exports as a share of their total goods exports over time. From 1997 (the year the ITA actually took effect) to 2009, the share of ICT goods exports as a percentage of the country's total exports increased by 93 percent in the Philippines, 59 percent in India, and 57 percent in China, while it declined by 49 percent in Argentina and 26 percent in Brazil. This suggests that if countries like Argentina wish to

boost their ICT exports, not being in the ITA is not the way to do it. While ITA membership does not guarantee that a country will be a strong ICT exporter, it does appear to be associated with stronger ICT exports.

Why do tariffs on ICT products seem to yield the counterintuitive result that their domestic production is not fostered—the goal of import substitution industrialization (ISI) policies that attempt to spur domestic production of products by making imports prohibitively expensive through high tariffs? In part, the answer is that the globalization of ICT supply chains means that ICT products often move across several countries in their production, with key components added at various steps in the process before final assembly occurs. In this case, high tariffs on ICT parts and products simply compel ICT firms to bypass these countries entirely in their global supply chains and manufacture and assemble elsewhere. While ISI policies might have a better chance of success in industries like steel, where high tariffs discourage imports and may spur more domestic production, the conventional view that tariffs can lead to more production domestically just doesn't make any sense at all in the globalized ICT industry.

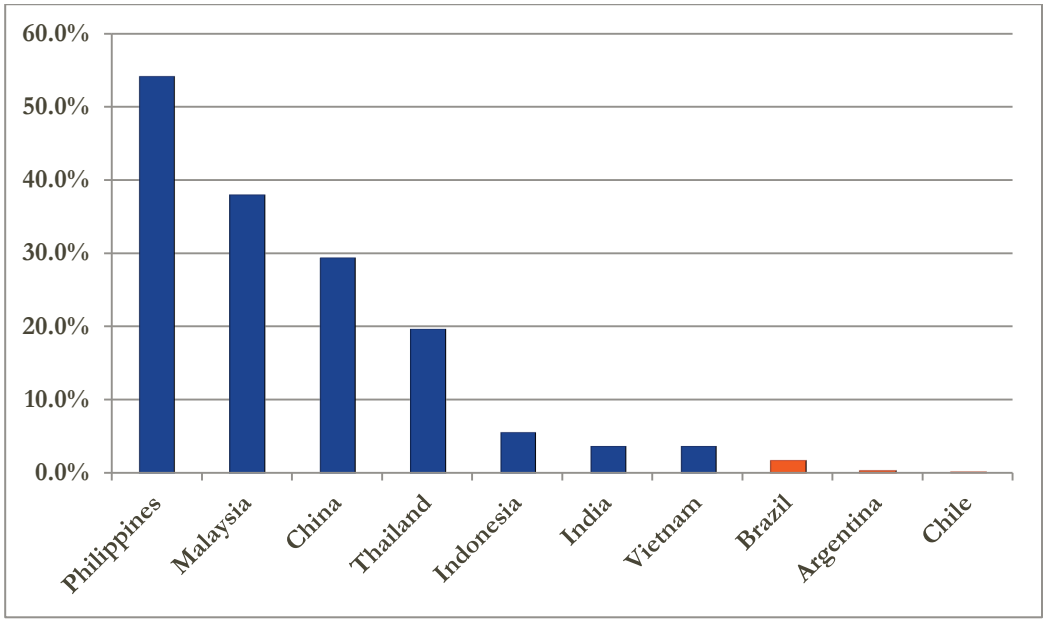

Figure 5: ICT Goods Exports as Percentage of Total Goods Exports, 2009[76]
Note: All charts depict ITA members in blue; Non-ITA members depicted in orange

Many ITA members are also strong exporters of ICT services. This is not surprising, because countries whose businesses and consumers have access to best-of-breed, cost-competitive ICT products are likely to be better positioned to provide more competitive ICT services. ICT services exports account for 47 percent of India's total services exports, 13 percent of the Philippines', and about 7 percent of Indonesian and Malaysian services exports, as Figure 6 shows.

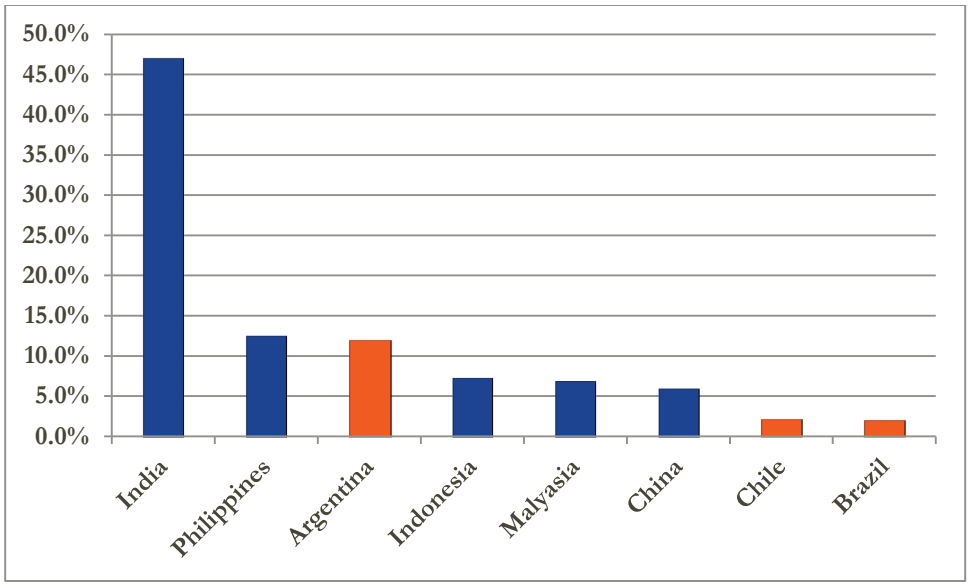

Figure 6: ICT Services Exports as Percentage of Total Services Exports, 2010[77]

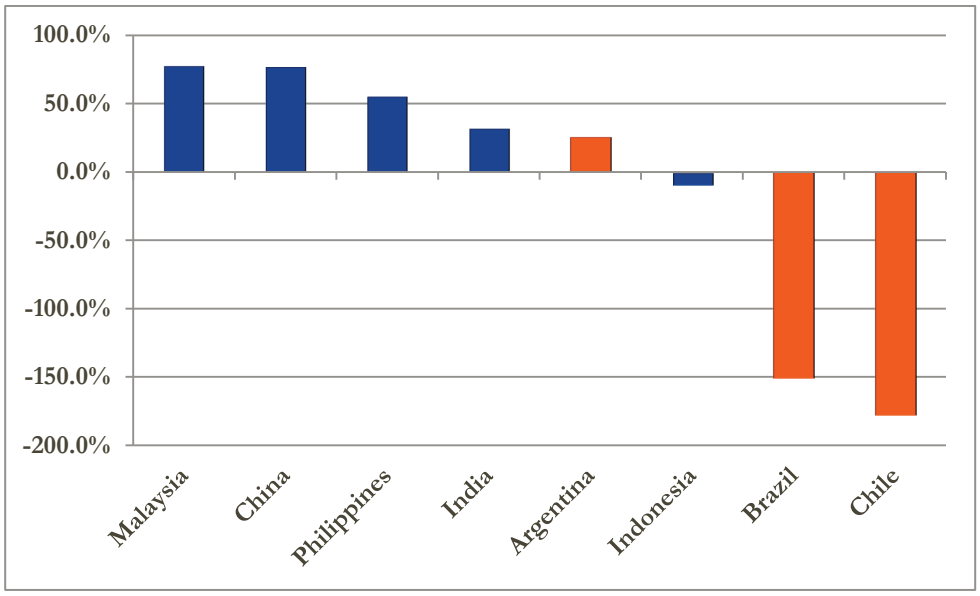

Figure 7: Percent Change in ICT Services Exports as Percentage of Total Services Exports, 1996 (or most recent year available) to 2010[78]

Many of these ITA members saw faster growth in ICT services exports as a percentage of their overall services exports, as Figure 7 illustrates. Indeed, the percent that ICT services exports accounts for out of the country's total service exports increased by more than 50 percent (from the first year in which data is available to 2010) in Malaysia, China, and the Philippines, while ICT services exports as a percentage of the country's total services exports fell by 150 percent in Brazil and 177 percent in Chile from 1996 to 2010. While clearly many factors influence these trends, countries that make it more difficult or costly to procure best-of-breed ICT products are more likely to experience lagging ICT services export sectors.

In addition to empowering ICT goods and ICT services exports, by helping decrease the prices of ICTs through tariff reduction, the ITA has also helped facilitate the diffusion of ICTs such as mobile phones throughout developing countries. For example, Indonesia went from having just .28 mobile phone subscribers per 100 citizens in 1996 to 92 in 2010. Likewise, the number of cellular phone subscribers per 100 inhabitants in India increased from just .03 per 100 inhabitants in 1996 to 64 in 2010.[79] This proliferation of mobile communications/computing devices has bolstered the productivity, efficiency, and innovative capability of citizens and businesses, inspiring a wave of mobile-phone enabled innovations in developing countries, as ITIF has described in reports including *The Digital Quality of Life* and *The Internet Economy 25 Years After.com.*[80] To take just one example out of hundreds, mobile phones allow fishermen in India to monitor prices in real time and take their catch to local markets where it will fetch the best price, an innovation that positively impacted the fish industry in southern India by increasing profits for sellers by 8 percent and bringing down consumer costs by 4 percent.[81] Further, mobile phones have also improved health and quality of life by serving as a platform for delivery of ophthalmological diagnosis and disease detection (such as diabetes) services in developing countries. Mobile technologies are platforms for innovation, and the ITA has played an important role in furthering their diffusion throughout the developing world.

ITA expansion would boost global GDP by $190 billion.

ITA EXPANSION BENEFITS THE GLOBAL ECONOMY

Finally, ITA expansion will also benefit the overall global economy by increasing the global stock of ICT capital, which in turn boosts productivity, and hence per-capita incomes. Vu finds that a 10 percent increase in ICT capital stock adds approximately 0.45 percent points to output growth.[82] As noted previously, ITA expansion would bring an additional $400 billion in ICT trade under ITA coverage, and applying the 5.3 percent average tariff reduction on those products and the 1.3 import demand elasticity suggests that ITA expansion should led to a $28 billion increase in the global capital stock. The current global ICT capital stock is $4.1 trillion.[83] $28 billion represents 0.07 percent of this amount. If a 10 percent increase in ICT capital spurs a 0.45 percent increase in output growth, then a 0.07 percent increase in ICT capital stock will spur a 0.003 percent increase in output growth. As global GDP is $63.1 trillion, ITA expansion will lead to annual global GDP being $190 billion larger.

BEYOND ITA PRODUCT EXPANSION

As documented, expansion of the products covered by the ITA will produce immediate and substantial benefits for both the United States and the global economy. ITA product coverage expansion is attainable; it's supported by over 40 IT industry associations from around the world and backed by the leaders of the 21 Asia Pacific Economic Cooperation (APEC) economies, who at the 2011 APEC Leaders' Meeting in Honolulu in November 2011 issued a declaration that included a pledge to take a leadership role in launching new negotiations. ITA product expansion should be the immediate focus of the U.S. and global trade policy communities.

Longer term, however, expanding the geographic reach of countries participating in the ITA agreement also merits attention. While 73 of the 153 WTO member countries participate in the ITA, there are several notable exceptions, particularly in Africa and Latin

America. For example, Argentina, Brazil, Chile, and South Africa have failed to sign onto the ITA, meaning that they receive the benefits of duty-free access to the United States and 72 other countries for the high-technology products covered by the agreement without having to provide similar access to their own markets in return.

Ironically, as described above, such countries' decision not to participate in trade arrangements such as the ITA, which promote more uninhibited flows of global trade, only end up hurting themselves. For example, in a study comparing East Asian and Latin American countries, the World Bank found that the East Asian countries demonstrated larger flows of trade, foreign direct investment, and licensing behavior and suggested that this provides an explanation for the East Asian countries' relatively stronger technological growth than that of the Latin American countries.[84] Thus, it's ultimately in these countries' own interest to join trade-expanding vehicles such as the ITA.

Nevertheless, U.S. trade representatives should continue to work to expand the geographic scope of the agreement, and also make it a requirement that new countries entering the WTO, such as Russia, must also sign on to the ITA as a condition of entrance into the organization.

CONCLUSION

The ITA has been one of the most successful trade agreements ever undertaken. It has played an indispensable role in expanding global trade in ICT products, which has spurred innovation, enhanced productivity, increased employment, and accelerated economic growth. Expansion of the ITA would bring immediate and significant benefits to both ICT producers and consumers in the United States, Europe, and Asia—indeed, throughout the entire world. Now is the time for policymakers in ITA member countries to seize on the opportunity to further tariff rate reduction on ICT products, which promises to extend the already significant benefits the ITA has produced for individuals, businesses, and economies throughout the world. Doing so also offers a path forward to continue momentum for expanded global multilateral trade liberalization.

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ABOUT THE AUTHOR

Stephen Ezell is a Senior Analyst at the Information Technology and Innovation Foundation, with a focus on international information technology competitiveness and national innovation policies. Mr. Ezell holds a B.S. from the School of Foreign Service at Georgetown University, with an Honors Certificate from Georgetown's Landegger International Business Diplomacy program. He is the co-author of the forthcoming book, *Innovation Economics: The Race for Global Advantage* (Yale University Press, September 2012).

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